

## Effect of Nursing Intervention on Knowledge, Self-care practice and Expectation of care among patients with Glaucoma

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**Abstract:** **Background:** Medical attention to vision impairment is a vital element of daily living and overall well-being. Glaucoma remains one of the leading causes of blindness in Egypt and South Africa. Early detection, proper knowledge, self-care practice, effective treatment and strict compliance with treatment are important to prevent further damage and thus preserve vision. **Aim:** The purpose of this study was to assess the knowledge, self-care practices and expectations of care among patients with glaucoma. **Setting:** The study will be conducted at the ophthalmology Department in Menoufia University Hospital and EL Ramad Hospital in Shebin El-Kom, Menoufia Governorate, Egypt. **Methods:** Quasi experimental research design was used. Structured questionnaires for assessing knowledge, observational checklist to assess self-care practices and patient's expectations scale to assess patient's expectations regarding the received care. **Results:** regarding to knowledge there were highly statistically significant improvement among study and control group post intervention. Concerning total score of patient's practices there were highly statistically significant difference within study group at pre and post intervention, and between study and control group at post-intervention with  $p$  value  $< 0.001$ . concerning patient's expectations among studied groups there was a highly statistically significant improvement among study and control group ( $28.80\% \pm 2.82$  and  $22.64 \pm 3.90$ ) respectively post intervention. Good knowledge of glaucoma was significantly associated with good self-care practices of glaucoma ( $p < 0.001$ ). **Conclusion:** Nursing interventions is effective methods to enhance the clinical outcomes of the patient with glaucoma (knowledge, self-care practice & expectations). **Recommendation:** Ophthalmic patients should receive periodic training programs to improve, update, refreshing their knowledge and practice regarding glaucoma which a better achievement of patient's needs and providing safety.

**Key words:** Nursing intervention, Glaucoma, knowledge, Self-care practice and Expectation of care.

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### I. Introduction

Glaucoma prevalence is estimated to affect more than 67 million individuals globally and lead to blindness in 4.5 million individuals, and glaucoma will lead to bilateral blindness in 5.9 million individuals. In the UK, about two percent of the populations over 40 have glaucoma. On the other hand, about 2.7 million of individuals age 40 or older in the United States. There are around 120,000 cases of blindness in the United States between them 2.3 million cases of glaucoma and nearly 60% of blindness in parts of Africa is caused by glaucoma<sup>(1)</sup>.

According to **National Eye Institute**<sup>(2)</sup>; There are five main types of glaucoma: primary open angle glaucoma, angle closure glaucoma, secondary glaucoma, developmental glaucoma (congenital glaucoma) and Normal Tension Glaucoma

Common signs and symptoms of glaucoma vary depending on the type and stage of condition. Open-angle glaucoma (Patchy blind spots inside (peripheral) or central vision, frequently in both eyes and Tunnel vision in the advanced stages), Acute angle-closure glaucoma (Severe headache, Eye pain, Nausea and vomiting, blurred vision, Halos around lights and Eye redness) If left untreated, glaucoma will eventually cause blindness. Even with treatment, about 15 percent of people with glaucoma become blind in at least one eye within 20 years<sup>(2)</sup>.

Treatment of Glaucoma include: - prescription eye drops, laser surgery, or microsurgery to lower pressure in the eye. Eye drops, these either reduce the formation of fluid in the eye or increase its outflow, thereby lowering eye pressure. Side effects may include allergies, redness, stinging, blurred vision, and irritated eyes. Laser surgery, this procedure can slightly increase the flow of the fluid from the eye for people with open-

angle glaucoma. It can stop fluid blockage if have angle-closure glaucoma. Microsurgery, in a procedure called a trabeculectomy, it creates a new channel to drain the fluid and ease eye pressure. Open-angle glaucoma is most often treated with various combinations of eye drops, laser trabeculoplasty, and microsurgery. Congenital glaucoma -is primarily treated with surgery because the cause of the problem is a very distorted drainage system<sup>(3)</sup>.

Glaucoma is the leading cause of irreversible blindness worldwide. Importance of early diagnosis in glaucoma cannot be underestimated, for its effective management and prevention of blindness. Lack of awareness may not only influence the timing of the diagnosis, but also the utilization of eye care services. Assessment of awareness is the first step in the planning of disease management<sup>(4)</sup>.

Nursing intervention improves understanding, feeling of competence, comfort and assists with recovery and it is the major nursing activity to ensure that the client is aware of disease by increasing patient knowledge about glaucoma .Patients who are well prepared with detailed Educational instruction deal more effectively with their disease and are better prepared to manage their pain and engage in appropriate self -care activities such as eye drop instillation (handling, storage and administration), eye ointment application, eye exercises, eye compresses, hygiene, protection of affected site and daily life<sup>(5&6)</sup> .

Nursing intervention considers one of the most common successful interventions that are performed for glaucoma patients to promote patient's knowledge and self-care practice. With a globally aging population, the number of glaucoma patients is expected to rise; requiring better awareness to develop more effective and efficient methods of caring for these patients and improve outcomes, only few studies demonstrated the effectiveness of nursing intervention on patient with glaucoma<sup>(7)</sup>. In this respect, the main concern of the present study was to determine the effect of nursing intervention on knowledge, self-care practice and expectation of care among glaucoma patients.

### **Significance of the study**

Glaucoma is a chronic disease that requires life-long treatment and could ultimately lead to blindness. Glaucoma affects patients' independence in self-care and performance of the activities of daily living (ADL), with consequently reduced quality of life. Glaucoma prevalence is estimated to affect more than 67 million individuals globally and lead to blindness in 4.5 million individuals. There are more than 2.2 million people with visual impairment in Egypt 900,000 of which are totally blind, while in Menoufia the incidence of glaucoma is the cause of acquired blindness in 9.2% in Shebin El- kom. Glaucoma can be easily avoided and/or cured through awareness, early diagnosis and accurate medical treatment<sup>(8&1)</sup> .

Glaucoma have been correlated with blindness that can decreased quality-of-life and productivity for the blind and their care providers. Although glaucoma is not preventable, early detection and treatment can help to avoid serious damage to a person's vision. Increasing knowledge and improvement in self-care practice among glaucoma patients is important as the disease occur over a long period of time. Early detection of glaucoma helps to get better disease management and patient's Practice<sup>(9)</sup>

### **Purpose of the Study**

**The purpose of the current study:** - To examine the effect of nursing intervention on knowledge, self-care practice and expectation of care among patients with glaucoma.

**Research Hypotheses:** The following research hypotheses are formulated to achieve the aim of the study.

- Patients who receive nursing intervention (study group) will have higher knowledge score than patients who do not receive nursing intervention (control group).
- Patients who receive nursing intervention (study group) will exhibit higher level of self-care practice than patients who do not receive nursing intervention (control group).
- Patients who receive nursing intervention (study group) will exhibit more satisfactory expectation score than patients who do not receive nursing intervention (control group).

### **Subjects and methods:**

**Research design:** -Quasi experimental research design will be used.

**Setting:** -The study will be conducted at the ophthalmology Department in Menoufia University Hospital and EL Ramad Hospital in Shebin El-Kom, Menoufia Governorate, Egypt. Data were collected over a period of 6 months extended from the beginning January 2020 to the end of November 2020.

**Sampling:** - A consecutive sample of 90 adult patients with glaucoma from the previously mentioned setting then Patients will be divided randomly and alternatively into two equal groups (45) patients in each group (study and control) groups.

- Control group: - will receive routine hospital care only such as measuring blood pressure, measuring ocular pressure and taking prescribed medications.

-Study group: - will receive a detailed nursing intervention. It will include health education about glaucoma and self-care practice beside routine hospital care.

**Inclusion criteria: -**

Aged 18 years and more (<65years old)  
Diagnosed with glaucoma patient regardless of type.  
Alert and can communicate.

**Exclusion criteria: -**

- Acute physical or mental disorder and cognitive impairment such as burn, trauma, Delirium and Dementia because it may interfere with the patient's care
- Patient who attending any previous training sessions related to glaucoma

**Sample size calculation:**

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2}$$

where

$z$  is the  $z$  score

$\epsilon$  is the margin of error

$N$  is population size.

$\hat{p}$  is the population proportion.

**Tools of the study:**

Three tools were carried out for data collection of the current study.

**Tool 1: Structured Interview Questionnaire**

This tool was developed by the researcher; it will cover the following parts: -

**Part one: - Patient Socio-demographic data:** - It was used to assess patient's characteristics such as age, sex, level of education, occupation and marital status...etc.

**Part two: - Medical data:** - It was including information about past and present medical history such as duration of illness, taken medication, family history and previous surgery.... etc.

**Part three: Patients' Knowledge:** - It was used to assess patients' knowledge related to glaucoma. It includes 10 items about: definition, incidence, risk factors, causes, signs and symptoms, types, diagnostic evaluation, complications, prevention and management of glaucoma.

**Tool II: Observation checklist: -**

It was developed by **Margret, Watkinson & Seewoodhaky**,<sup>(10)</sup> and adapted by researcher to assess patient's practices regarding eye care.

**Tool III: - Patients' expectations scale**

Patients' expectations scale was developed by **Dawn, Santiago & Lee**,<sup>(11)</sup> and modified by the researcher to assess patient's expectations regarding the received care. **Methods:** -

**Written approval: -**

- Official letter from the Dean of the Faculty of Nursing, Menoufia University was delivered to the administrator of the hospitals (the hospital chief executive, the director of ophthalmic department and head nurses). The letter explained the purpose, methods of data collection and approval to conduct this study obtained after explanation the purpose of the study.

**Tool development: -**

- The first tool was developed by the researcher while second tool was developed by **Margret, Watkinson and Seewoodhaky**,<sup>(10)</sup> and the third tool was developed from **Dawn, Santiago and Lee**,<sup>(11)</sup> and was used by the researcher after modifications.

**Validity of the tools: -**

All tools were tested for its content validity by 5 experts in the field of (Medical Surgical Nursing, Ophthalmology, Clinical nurse specialist, Medical Statistics and English Specialty) and modifications were done to ascertain relevance and completeness.

**Reliability of the tools: -**

All tools were tested using a test-retest method to ascertain reliability of instruments, the period between each test was 2 weeks.

**Ethical consideration**

- A written approval was obtained from ethical and research committee of the Faculty of Nursing, Menoufia University.

- All participants who meet the inclusion criteria were informed about purpose, procedure, and benefits of the study then a written consent was obtained from all participants.
- Participation in the study was voluntary and the patients withdraw from the study at any time without penalty.
- Confidentiality and anonymity of patients was assured through coding all data and putting all papers in a closed cabinet.
- The nature of tools was not causing any physical or emotional harm to participants.

**A pilot study:** A pilot study was carried out prior to data collection on 10% of the sample size (9 patients) to assess the constructed tools for feasibility and applicability and the necessary modifications were carried out accordingly. The samples used were excluded from the actual study.

**Data collection:**

- Data collection were collected over a period of 11 months extended from the beginning of January 2020 to the end of November 2020.

▪ Patients who agreed to participate in the study and fulfilled the inclusion criteria were interviewed individually by the researcher at the Outpatient Clinics at Clinical Oncology Department and Radiotherapy Unit.

▪ The researcher dealt with the control group ( II ) firstly then the study group ( I ) to avoid the contamination of results. The purpose of the study was explained to each subject of both study and control group.

▪ The study applied four consecutive phases namely: **assessment, planning, implementation and evaluation.**

▪ **Assessment phases:** This session took about 20-30 minutes for each subject. It begins after developing of the tools and getting the official permission. The researcher started to collect the data according to the inclusion criteria and acceptance of patients to participate in the study.

○ Each subject of both groups was interviewed individually and assessed for sociodemographic data and medical data by using part one and two from tool I

○ All subjects of both groups were assessed for knowledge about glaucoma and its management as Definition, Incidence, Risk factors, Causes, Signs and symptoms, Types, Diagnostic evaluation, Complications and Management of Glaucoma by using part three tool I.

○ All subjects of both groups were assessed for self-care practices using observational checklist (instrument II) for eye drop instillation (handling, storage and administration), eye ointment application, and eye exercises and eye compresses.

○ All subjects of both groups were assessed for expectation about care as communication, interpersonal manner, ophthalmologists and nurses' skills, examination and testing, logistics of health services using instrument III

• **Planning phase:** Based on the gathered information and knowledge level of subjects gathered during assessment phase a colored booklet supported with illustrative pictures and simple videos was prepared that included information about:

○ Basic information about eye, physiology of eye in addition to glaucoma disease such as (definition, incidence, causes, risk factors, types, signs, symptoms, diagnostic evaluation, complication, management and prevention of glaucoma) was given for each subject of group I .an instructional booklet was prepared by the researcher that include instruction about glaucoma disease such as definition, incidence, causes, risk factors, types, signs , symptoms, diagnostic evaluation ,complication, management and prevention of glaucoma.

○ **Nursing intervention** : focused on self-care practices such as eye drop instillation (handling, storage and administration), eye ointment application, eye exercises and eye compresses, moreover a video was prepared to teach subjects in study group about using eye drop instillation (handling, storage and administration), eye ointment application, and eye exercises and eye compresses. it was 2 parts as follow.

1) **The first practical part:** included checking feedback of received information about glaucoma and filling gap of missed knowledge that instructed before during theoretical session.

2) **The second practical part:** included demonstration and return demonstration of practices related to eye care as; instilling eye drops, applying ointment, eye compresses and non-pharmacological methods to reduce tension or pressure such as relaxation massage, tense & relax exercise, deep breathing exercise and the researcher observed their practice using tool II and tool III.

• **Implementation phase**

- The researcher interviewed each subject of study group individually at the waiting area at the Ophthalmology Department in Menoufia University Hospital and EL Ramad Hospital in Shebin El-Kom, Menoufia Governorate. The researcher conducted at least three teaching sessions or more for each subject according to his/ her level of understanding.

- Each session was conducted using lecture and discussion and during the final session demonstration and re-demonstration were added.

- The researcher distributed the prepared booklet for every subject of group 1 (study group) or his/her accompanying person before starting session I.

- **During the first session:** Information about glaucoma: definition, types, risk factors, diagnosis and treatment. It took about 30-45 minutes according to patients' level of understanding. At the end of the session the researcher allowed subjects to ask questions and provided them with the answers.

- **The second teaching session,** at the beginning of second session, the researcher reinforced the received information, the researcher taught the subjects of the study group (I) how to use eye drop instillation (handling, storage and administration), eye ointment application, and eye exercises and eye compresses and solve any problems that might arise during practicing of self-care. At the end of the session the researcher allowed subjects to ask questions and provided them with the answers. It took about 45 -60 minutes according to subjects' level of understanding.

- **During the third session:** In this session the researcher refreshed and reinforced the previous information.

- The researcher taught subjects how to perform Self-care practices Then subjects re-demonstrated the learned skills. It took about 30-45 minutes.

**4) Evaluation phase:** Evaluation of all subjects of both groups was carried out after two weeks post intervention to highlight the educational effect. As all subjects of both groups were assessed for their knowledge, self-care practice by using part three of instrument I, II and III. for determining the effectiveness of nursing intervention.

### Statistical analysis

- The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 19, SPSS Inc. Chicago, IL, USA).

## II. Results:

**Table (1): Number and Percentage Distribution of Socio-Demographic Characteristics of the Studied Groups**

Demographic characteristics	Studied groups				X2	P value
	Study group (n=45)		Control group (n=45)			
	NO.	%	NO.	%		
<b>Age (years):</b> Mean±SD Range	53.48 ± 5.65 48.0 , 62.0		55.40 ±5.87 47.0 – 65.0		<b>T- test =</b> 1.56	0.12 NS
<b>Gender:</b> Male Female	22 23	48.9 51.1	29 16	64.4 35.6	2.21	0.13 NS
<b>Residence:</b> Urban Rural	11 34	24.4 75.6	5 40	11.1 88.9	2.73	0.09 NS
<b>Marital status:</b> Single Married Widowed	0 45 0	0.0 100.0 0.0	22 17 6	48.9 37.8 13.3	40.64	0.001 HS
<b>Education level:</b> Illiterate Read and write. Primary Secondary University	4 7 12 13 9	8.9 15.6 26.7 28.9 20.0	6 16 7 11 5	13.3 35.6 15.6 24.4 11.1	6.54	0.16 NS
<b>Occupation:</b> Hand worker Administrative work Not working Housewife	9 19 6 11	20.0 42.2 13.3 24.4	16 9 11 9	35.6 20.0 24.4 20.0	7.20	0.06 NS
<b>Monthly income:</b> Enough Not enough	34 11	75.6 24.4	31 14	68.9 31.1	0.49	0.48 NS
<b>Smoking:</b> No Yes	5 40	11.1 88.9	11 34	24.4 75.6	2.73	0.09 NS

**T test:** student t test    **χ<sup>2</sup>:** chi square test    **NS:** not significant

**HS:** highly significant

**Table (1):** Illustrates the number and percentage distribution of both study and control groups according to their sociodemographic characteristics. This table shows that both study and control groups aged from 47 to 65 years with mean age ( $53.48 \pm 5.65$  and  $55.40 \pm 5.87$  respectively). About two thirds of control group (64.4%) were males while 51.1% were female of study group. Concerning marital status, all study group were married comparing to 37.8% of control group. Regarding level of education, about one third of study group (28.9%) graduated from secondary school while about one third of control group (35.6%) could read and write. Regarding to occupation, more than one third of study group (42.2%) had administrative work and 35.6% of control group were hand workers. As regard residence, majority of both groups (75.6%- 88.9% respectively) were from Rural areas. As regard monthly income, majority of both groups (75.6%- 68.9% respectively) have enough income and were not smokers. There were no statistically significant differences between both groups regarding all sociodemographic characteristics except marital status have highly statistical difference with P value  $<0.001$

**Table (2): Medical Data of the Studied Groups:**

Medical data	Studied groups				X2	P value
	Study group (n=45)		Control group (n=45)			
	NO.	%	NO.	%		
<b>Past Medical history</b>						
<b>Cataract:</b>	20	44.4	28	62.2	2.85	0.09 NS
<b>Refractive error</b>	5	11.1	2	4.4	1.39	0.43* NS
<b>DM</b>	34	75.6	28	62.2	1.86	0.17 NS
<b>Duration of DM (years)</b> Mean±SD Range	5.11±1.36 4.0 & 7.0		4.21±0.99 3.0 , 5.0		T=3.0	0.004 S
<b>Hypertension:</b>	16	35.6	24	53.3	2.88	0.09 NS
<b>Duration of hypertension (years)</b> Mean±SD Range	2.68±0.47 2.0 – 3.0		2.91±1.01 2.0 – 4.0		T= 0.95	0.34 NS
<b>Past Surgical history</b>						
<b>Previous surgery:</b>	40	88.9	17	37.8	25.31	<0.001 HS
<b>Previous glaucoma surgery</b>	5	11.1	11	24.4	2.73	0.09 NS
None of patients in both groups had cataract surgery or refractive error surgery						
<b>Family history</b>						
<b>Cataract</b>	17	37.8	28	62.2	5.37	0.02 S
<b>Refractive error</b>	4	8.9	7	15.6	0.93	0.33 NS
<b>DM</b>	42	93.3	39	86.7	1.11	0.48* NS
<b>Hypertension</b>	44	97.8	39	86.7	3.87	0.11* NS
<b>Glaucoma</b>	11	24.4	11	24.4	NA	NA
<b>Source of information related to glaucoma:</b> Ophthalmologist, Optometrist	15	33.3	17	37.8	1.81	0.40 NS
TV, magazines or other media	19	42.2	22	48.9		
Relative/friend suffering from it	11	24.4	6	13.3		
<b>Attending any training sessions related to glaucoma:</b> Yes No	0 45	0.0 100.0	0 45	0.0 100.0	NA	NA

\*Fisher`s Exact test    **NA:** not applicable    **S:** significant    **t test:** student t test  
**NS:** not significant    **HS:** highly significant

**Table (2):** Illustrates distribution of both study and control groups regarding their medical history. This table reveals that more than half of control group have cataract (62.2%), Diabetes mellitus (62.2%) and hypertension (53.3%) while more than three fourths of study group (75.6%) have diabetes mellitus in past medical history. Regarding past surgical history, majority of study group (88.9%) have previous surgeries and

less than one third of control group (24.4%) have previous glaucoma surgery. Regarding to family history, majority of both groups have hypertension (97.8% -86.7%) and diabetes mellitus (93.3%-86.7%) respectively, followed by 37.8% of cataract among study group compared to 62.2% of cataract among control group .24.4% have glaucoma among both groups with same percentage and minority of both groups (8.9%-15.6% respectively) had past family history of refractive error. Regarding source of information related to glaucoma nearly half of both groups (42.2% and 48.9% respectively) know information from TV, magazine and media while minority of study group (24.4%) and control group (13.3%) know from relative and friends suffering from glaucoma. No one of both group attending any training sessions related to glaucoma.

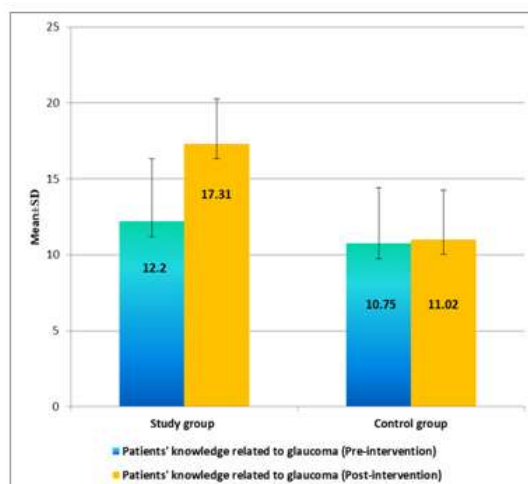
**Table (3): Comparison of Patients' Knowledge Related to Glaucoma Pre- and Post- intervention) among the Studied Groups:**

Patients' knowledge related to glaucoma	Studied groups		Mann- Whitney	P value
	Study group (n=25)	Control group (n=25)		
	Mean±SD Range	Mean±SD Range		
<b>Total score:</b> Pre-intervention	12.20±4.14 3.0 , 19.0	10.75±3.66 4.0 , 15.0	1.39	0.16 NS
Post-intervention	17.31±2.96 8.0 , 20.0	11.02±3.25 5.0 , 17.0	9.05	0.001 HS
<b>Wilcoxon test</b>	5.45	1.10		
<b>P value</b>	<0.001 HS	0.26 NS		

NS: not significant    HS: highly significant

**Table (3):** Illustrates Comparison of patient's knowledge related to glaucoma pre and post-intervention among studied groups .This table illustrates the difference between studied groups pre and post intervention and reveals that mean score of knowledge among studied group pre intervention 12.20±4.14 and 10.75±3.66 of study and control group respectively that were not statistical significant before intervention and highly statistical significant improvement among study and control group which recording 17.31±2.96 and 11.02±3.25 respectively post intervention. Finally, there were an apparent statistically significant difference between studied groups pre and post intervention and within study group pre and post intervention with p value <0.001.

**Figure (1):** Mean patient's knowledge score related to glaucoma pre and post intervention among study and control groups n=90).



This figure reveals that mean knowledge score at pre intervention were 12.20±4.14 and 10.75±3.66 for study and control groups, respectively. While mean scores of knowledge shows higher statistical significant improvement post-intervention recording (17.31±2.96 for study group) and (11.02±3.25 for control group) with p value <0.001.

**Table (4): Comparison Mean and Standard Deviation of Patient's Practices Regarding Eye Care Pre- and Post- intervention among the Studied Groups:**

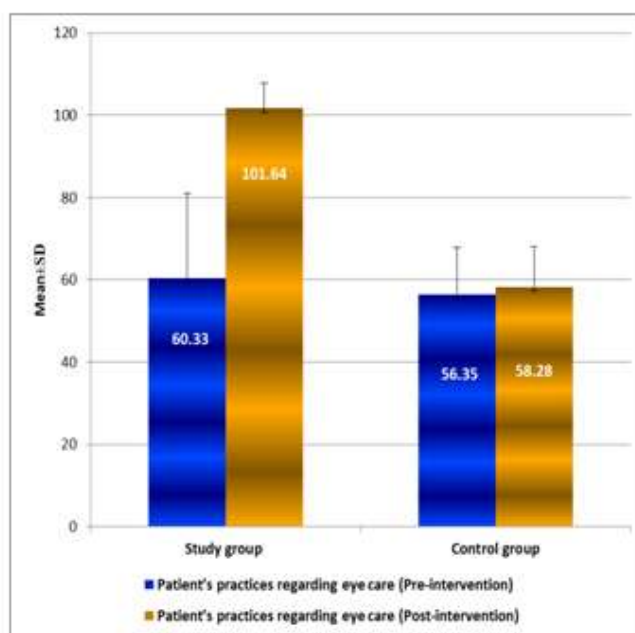
Patient's practices regarding eye care	Studied groups		Test of sig.	P value
	Study group (n=45)	Control group (n=45)		
	Mean±SD Range	Mean±SD Range		
Eye Drop Instillation (pre-intervention)	20.22±4.89 11.0 – 29.0	20.77±3.47 13.0 – 26.0	T= 0.62	0.53 NS
Eye Drop Instillation (post-intervention)	27.86±1.71 24.0 – 30.0	21.82±2.97 15.0 – 27.0	T= 11.82	<0.001 HS
<b>Paired t test</b>	11.12	4.51		
<b>P value</b>	<0.001 HS	<0.001 HS		
Eye Ointment Application (pre-intervention)	14.55±3.16 8.0 – 20.0	14.97±3.07 8.0 – 19.0	T= 0.64	0.52 NS
Eye Ointment Application (post-intervention)	20.31±1.76 16.0 – 22.0	15.48±3.13 9.0 – 22.0	T= 8.99	<0.001 HS
<b>Paired t test</b>	10.16	1.25		
<b>P value</b>	<0.001 HS	0.21 NS		
Eye Compresses (pre-intervention)	1.44±1.73 0.0 – 4.0	0.66±1.07 0.0 – 3.0	U= 2.58	0.01 S
Eye Compresses (post-intervention)	3.62±0.61 2.0 – 4.0	0.73±1.09 0.0 – 3.0	U= 8.07	<0.001 HS
<b>Wilcoxon test</b>	4.91	1.85		
<b>P value</b>	<0.001 HS	0.06 NS		
Non- pharmacological methods to reduce pressure or tension of glaucoma (pre-intervention)	24.11±12.32 7.0 – 48.0	20.0±7.93 8.0 – 44.0	U= 1.07	0.28 NS
Non- pharmacological methods to reduce pressure or tension of glaucoma (post-intervention)	49.84±5.40 41.0 – 58.0	21.64±7.06 10.0 – 44.0	T= 21.27	<0.001 HS
<b>Wilcoxon test</b>	5.84	4.33		
<b>P value</b>	<0.001 HS	<0.001 HS		
<b>Total score (pre-intervention)</b>	60.33±20.59 28.0 – 100.0	56.35±11.54 35.0 – 88.0	U= 0.40	0.68 NS
<b>Total score (post-intervention)</b>	101.64±6.12 92.0 – 114.0	58.28±9.79 37.0 – 88.0	T= 24.80	<0.001 HS
Test of sig.	W= 5.84	Paired t= 2.64		
P value	<0.001 HS	0.01 S		

HS: highly significant    t test: student t test    U: mann-whitney  
NS: not significant        S: not significant



**Table (4):** Illustrates Comparison of patient's practices regarding eye care pre - post intervention among studied groups. This table shows that there was highly statistical significant difference within study group and within control group regarding to eye drop instillation pre and post intervention with p value <0.001 also, there was highly statistical significant difference between control and study group regarding to eye drop instillation post intervention. Concerning eye ointment application; there were highly statistical significant difference within study group(pre and post intervention ) and between study and control group at post intervention with p value <0.001 .Regarding to non-pharmacological methods there were highly statistical significant difference within study group and within control group at pre and post intervention, and highly statistical significant difference between study and control group at post intervention with p value <0.001. Concerning total score of patient's practices there were highly statistically significant difference within study group at pre and post intervention, and between study and control group at post-intervention with p value <0.001 while there was significant difference within control group at pre and post intervention with p value 0.01.

**Figure (2):** Mean patient's practices regarding eye care related to glaucoma pre and post intervention among study and control groups (n=90).



This figure reveals that the mean of patient's practices regarding eye care pre intervention were 60.33±20.59 and 56.35±11.54 for study and control groups respectively. While mean scores of patient's practices regarding eye care post intervention shows higher statistically significant improvement post-intervention recording (101.64±6.12for study group) and (58.28±9.79 for control group) respectively.

**Table (5): Comparison of Mean and Standard Deviation of Patients' Expectation pre- and post-intervention among the Studied Groups:**

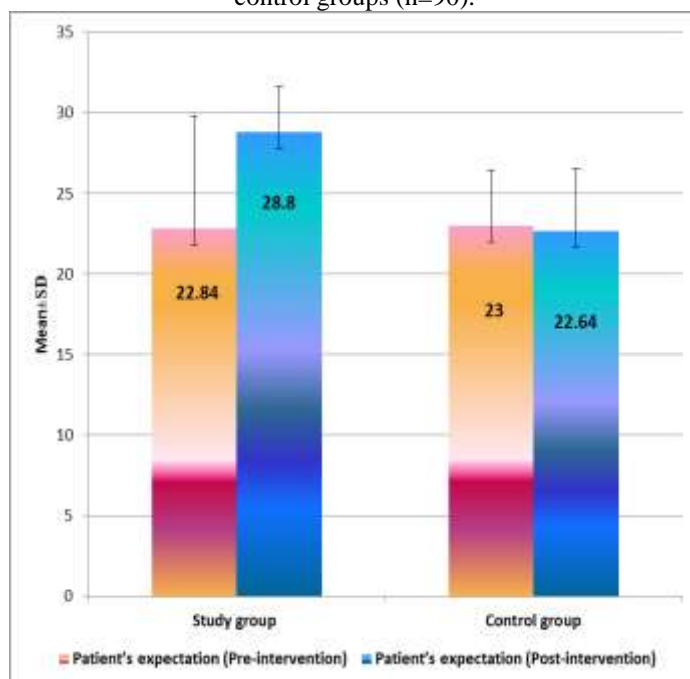
Patients' expectation	Studied groups		Students` t test	P value
	Study group (n=25)	Control group (n=25)		
	Mean±SD Range	Mean±SD Range		
<b>Total score:</b>				
Pre- intervention	22.84±6.97 10.0 – 34.0	23.0±3.43 12.0 – 27.0	0.13	0.89 NS
Post- intervention	28.80±2.82 22.0 – 34.0	22.64±3.90 12.0 – 30.0	8.56	<0.001 HS
<b>Paired t test</b>	6.57	1.78		
<b>P value</b>	<0.001 HS	0.08 NS		

HS: highly significant

NS: not significant

**Table (5):** Illustrates Comparison of patient's expectations (pre -post intervention) among studied groups This table reveals that mean score of patient's expectations among studied group pre intervention were (22.84±6.97 and 23.0±3.43) of study and control group respectively and there was a highly statistically significant improvement among study and control group (28.80±2.82 and 22.64±3.90) respectively post intervention. Finally, there Were an apparent statistically significant difference within study group pre and post intervention with p value <0.001.

**Figure (3):** Mean patient's expectations score related to glaucoma pre and post intervention among study and control groups (n=90).



This figure reveals that the mean of patient's expectations regarding eye care pre intervention were 22.84±6.97 and 23.0±3.43 for study and control groups, respectively. While mean scores of patient's expectations post intervention shows higher statistically significant improvement post-intervention recording (28.80±2.82for study group) and (22.64±3.90 for control group) respectively.

**Table (6): Correlation Between Patients` Knowledge, Practice and Expectation Scores among the Study Group:**

Patients` knowledge, practice and expectation scores among the study group	Patients` knowledge score (pre-intervention)		Patients` knowledge score (post-intervention)	
	R (spearman correlation coefficient)	P value	R (spearman correlation coefficient)	P value
Patients` practice score (pre-intervention)	0.63	<0.001 HS		
Patients` practice score (post-intervention)			0.37	0.01 S
Patients` expectation score (pre-intervention)	0.68	<0.001 HS		
Patients` expectation score (post-intervention)			0.34	0.01 S

**HS:** highly significant    **S:** not significant

**Table (6):** Illustrates correlation between patient's knowledge score, practice and expectations score among studied groups. This table reveals that there was positive correlation between total knowledge score pre intervention and patients practice score pre intervention with highly statistical significance with p value <0.001 and there was positive correlation also between total knowledge score post intervention and patients practice score post intervention with statistical significance with p value 0.01. Regarding correlation between knowledge and patient's expectation there was positive correlation between total knowledge score pre intervention and patients expectations score pre intervention with highly statistical significance with p value <0.001 and there was positive correlation also between total knowledge score post intervention and patients expectations score post intervention with statistical significance with p value 0.01

### III. Discussion

#### Sociodemographic characteristics of the studied sample:

**Regarding to age,** the present study showed that mean age of control group was 55.40±5.87 and the studied group was 53.48±5.65. This finding was consistent with the study done by **Mansour, M., et al,** <sup>(12)</sup> who stated that the mean age of studied patients was 52.9±6.5 years. Also this finding was in line with **Terzic., et al;** <sup>(13)</sup> who reported that most of the studied sample was with mean age 57.6 years. On the other hand **Lee, J., et al;** <sup>(14)</sup> reported that the majority of patients age were less than 25 years old and **Latif A., et al;** <sup>(8)</sup> who showed that around one half of studied sample aged between 20 to 30 years old.

**Regarding to sex,** the present study revealed that, About two thirds of control group (64.4%) were males while (51.1%) were female this agreed with **Demirtas Z., et al,** <sup>(15)</sup> who reported that more than half of control group were males. Moreover **Kotecha., et al;** <sup>(16)</sup> who reported that two thirds of control group were males and that was harmonized with **Mansour, M., et al**

; <sup>(12)</sup> who found that the majority of control group were males. Also (**Latif, A., et al.** <sup>(8)</sup> who showed that most control participants were males while about half of study group were females.

**Regarding to marital status** the present study revealed that all study group were married comparing to (48.9%) of control group. This finding was matched with their age group and was supported by (**Kumar, J., et al;** <sup>(17)</sup> who reported that the majority of their studied subjects were married. This finding is contradicted with **Fazio,** <sup>(18)</sup> who showed that most of his subjects were single. This contraindication may be related to the age group of the present study that usually be married according to culture in Egypt.

**Regarding to educational level,** the present study found that, about one third of study group (28.9%) graduated from secondary school while about one third control group (35.6%) could read and write. The current study finding in line with **Oh SA, Ra H & Jee D;** <sup>(19)</sup> who found that more than one third of studied sample were graduated from high school. But this result is contradicted with **Ogbonnaya** <sup>(20)</sup>; who reported that minority of intervention group had higher education. (**Lee J., et al.** <sup>(14)</sup> reported that more than three quarters of the studied patients had higher education and also **Kotecha., et al;** <sup>(16)</sup> who revealed that the majority of patients had a higher education .

**In relation to occupation,** the present study showed that about more than half of the study group had administrative work. This result supported by **Ichhpujani et al;** <sup>(21)</sup> who concluded that the rate of jopness is high among glaucoma patients.

The present study revealed that the most common chronic diseases among studied subjects of both groups were hypertension and DM. This finding is consistent with (**Ho et al;** <sup>(22)</sup> who mentioned that hypertension was highest among glaucoma and about half of both groups of the study complain of chronic diseases.

**Regarding family history,** the current study found that most subjects did not have family history of eye disease. This result contradicted with the reports of a high prevalence of a positive family history of eye disease among individuals with glaucoma <sup>(2).</sup>

Moreover, the current study finding was in agreement with **Fazio ,** <sup>(18)</sup> who revealed that, minority of both groups had past family history of eye diseases. Also the finding was in line with **Latif A., et al;** <sup>(8)</sup> who showed that majority of both groups had chronic disease as hypertension and diabetes mellitus and minority of them had eye disease. Also, the finding was consistent with **Ho et al;** <sup>(22)</sup> who mentioned that family history of hypertension was highest among glaucoma and about half of both groups of the study complain of chronic diseases.

Regarding nursing intervention, the current study found that about three fourths of both groups have low knowledge level about glaucoma and did not practice exercise at all. This finding is consistent with the result of **Seewoodhary, R. & Watkinson, S.** <sup>(23)</sup> who found that only one third of their subjects practiced

exercise. From the researcher point of view, lack of awareness about glaucoma and its management and these patients did not have enough information about glaucoma and importance of eye exercises for them. The mean knowledge level, self-care practice and expectations at baseline data for both study and control group indicated that these subjects in need for education about glaucoma to increase their knowledge, improve their self-care practices and their expectations from care and this supported by **Ezenwa, A., & Nwosu, S.**<sup>(24)</sup>.

**Regarding Patient's total knowledge:** the current study finding was in agreement with **Lee, J., et al;**<sup>(14)</sup> who revealed that, all of the studied patients had adequate level of knowledge score immediately post-implementation of nursing intervention. Also the finding was in line with **Latif, A., et al;**<sup>(8)</sup> who showed that level of knowledge was improved post immediate implementation of nursing intervention to good level with highly statistically significant improvement. On the other hand **Kumar, J., et al;**<sup>(17)</sup> who reported that patients' knowledge of the anatomy and physiology of the eye was unsatisfactory. Additionally, the findings of the current study were in line with **Newman et al;**<sup>(25)</sup> who revealed that there was an improvement in the patient's knowledge after application of the educational nursing intervention than before application. A similar success of an intervention in improving patients' knowledge about eye care was demonstrated in a study in **Kumar, J., et al;**<sup>(17)</sup> who reported that The implementation of nursing intervention led to significant improvements in patient's knowledge in all tested areas, and this improvement was retained throughout the follow-up. This improvement indicates positive impact of the intervention on patients' knowledge, which was confirmed through multi analysis which identified the intervention as a significant independent positive predictor of the improvement in patient's knowledge. From the researcher point of view, the low knowledge score before any intervention demonstrates patients' educational needs. While increased knowledge level after education stresses the effect of these interventions. In **Newman et al;**<sup>(25)</sup> research study in Michigan titled Educational Intervention to improve medication Adherence in African Americans diagnosed with glaucoma: results of an educational intervention reported a significant rise in patients' knowledge of treatment after intervention

#### **Regarding Self-care practice**

the current study showed that there were significant improvements in the proportion of patients' reporting good eye care practices. Clearly patients need health education to increase their awareness about the importance of eye care to reduce the risk of visual impairment. According to **Compton and Tobin,**<sup>(26)</sup> Eye care practitioners may prescribe eye drops without properly explaining or showing the technique for correct instillation of eye drops because of the lack of time in busy practice or lack of awareness of the fact that the patient does not know how to correctly instill drops. The results of the current study revealed that there was a positive correlation between patient's knowledge and patient's self-care practice post intervention which make study group have proper and effective self-care score post intervention. This finding agreed with the results of **Newman et al;**<sup>(25)</sup> who found that the educational interventions improve patient compliance and self-care practice. Also, the results of the current study showed that there was highly statistically significant difference of patient's practice regarding eye care post intervention with p value <0.001. This finding is in line with **Mansour et al;**<sup>(12)</sup> Who recorded that there was a significant correlation between awareness of glaucoma and self-care practice. From the researcher point of view, this may be a result of effectiveness of nursing intervention that led to increase their awareness about glaucoma and their self-care practice.

#### **Regarding Patients' expectations**

Patients' expectations are mostly met post nursing intervention as compared with pre nursing intervention; regarding to patient expectation the current study results revealed that patients who receive nursing intervention showed more satisfactory expectation score than patients who don't receive nursing intervention. Nursing intervention provided led to a major achievement in patients' expectation post- intervention for the study group as compared with pre-intervention for the control group. There was highly statistically significant achievement in meeting patients' expectation after nursing intervention. This result was in the line with **Ezenwa A., & Nwosu,**<sup>(24)</sup> who revealed higher score regarding expectation of care post intervention. Also agreed with **Howard**<sup>(27)</sup> who founded that the improvement of patients' knowledge and practice lead to significant improvements in achievement of all patients' needs and expectation after guidelines' implementation compared with baseline.

The results of the current study revealed that there was a positive correlation between patient's knowledge and patient's self-care practice post intervention which make study group have proper and effective self-care score post intervention. This finding was in agreement with the results of **Newman et al;**<sup>(25)</sup> who found that the educational interventions improve patient compliance and self-care practice .Also the results of the current study showed that there were highly statistically significant difference of patient's practice regarding eye care post intervention with p value <0.001 .This finding is in line with **Mansour M., et al;**<sup>(12)</sup> Who recorded that there was a significant correlation between awareness of glaucoma and self-care practice .From

the researcher point of view, this may be a result of effectiveness of nursing intervention that lead to increase their awareness about glaucoma and their self-care practice.

#### **IV. Conclusion:**

Based on the findings of the present study, it can be concluded that: There was an improvement in patients' knowledge and practice regarding glaucoma disease after nursing intervention. Educational nursing interventions is effective methods to enhance the clinical outcomes of the patient with glaucoma, increase knowledge, improve self - care practice, improve the quality of life and assist the patient to meet needs and perform daily living activities effectively.

#### **V. Recommendations:**

Ophthalmic patients should receive periodic training programs to improve, update, refreshing their knowledge and practice regarding glaucoma which a better achievement of patient's needs and minimize complications as visual problems. Replication of the study on a large sample size and with long term follow up can help in generalized the results on other clinical areas.

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