Effect of an Educational Program for Patients after Retinal Detachment Surgery on their Performance and Postoperative Pain Management

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Abstract

Background: Retinal detachment describes an emergency situation in which a thin layer of tissue (the retina) at the back of the eye pulls away from its normal position. Retinal detachment separates the retinal cells from the layer of blood vessels that provides oxygen and nourishment. The longer retinal detachment left untreated, the greater the risk of permanent vision loss in the affected eye. **Aim:** The study aimed to evaluate the effect of an educational program for patients after retinal detachment surgery on their performance and postoperative pain management. **Methods:** The following hypotheses were formulated to achieve the study aim. H1: Performance of the study group will be improved post program implementation than the control group. H2: The study group will be able to manage pain post program implementation than the control group. H3: There will be significant correlation between patients' performance and pain management post program implementation for the study group. A quasi-experimental research design was utilized to conduct the current study in the ophthalmology department at Benha University Hospital. A purposive sample of (100) adult patients post retinal detachment surgery were included in this study. Three tools were used, the patients' knowledge assessment questionnaire, the patients' practice observational checklist regarding eye care and visual pain analogue scale to assess pain severity. **Results:** This study shows that most patients had an unsatisfactory level of total knowledge and inadequate total practice regarding the postoperative pain management after retinal detachment surgery pre-program implementation (68% and 76%). This result improved significantly regarding all knowledge and practice elements post-program implementation, where the majority of the patients had a satisfactory level of their total knowledge and adequate total practice (78% and 75%). **Conclusion:** The majority of the studied patients had an unsatisfactory performance level (knowledge and practice) concerning postoperative pain management after retinal detachment surgery pre-program implementation. In contrast, most of the studied patients had statistically significant improvement in their performance post program implementation. Also, there was a significant positive correlation between patients' performance and pain management post program implementation that supports the research hypotheses. The study recommended continuous in-service training programs and repeating the study on a high probability sample to achieve generalization of the findings.

Keywords: Educational program, Patients' performance, retinal detachment surgery, postoperative pain management.

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Introduction:

Retinal detachment is a condition in which separation of the retina from its connection at the back of the eye occur. The separation usually results from a tear in the retina, which often occurs when the vitreous gel pulls loose or separates from its attachment to the retina. Once the retina has torn, the vitreous liquid can pass through the tear and accumulate behind the retina. The build-up of fluid behind the retina is what separates (detaches) the retina from the back of the eye. Vision loss occurs if the detached retina is not repaired ***(Sheil, 2020).***

Risk factors for developing a rhegmatogenous retinal detachment include lattice degeneration (thinning in the peripheral retina, or the area outside of the central retina), high myopia (extreme near-sightedness), advanced age, family history of retinal tears or retinal detachment, previous retinal detachment, previous eye surgery such as cataract surgery, and trauma ***(Bakri, et al., 2016).***

There are three main causes of retinal detachment, each with its own set of risk factors. The most common type is called a "rhegmatogenous" detachment, and is caused by a tear or hole in the retina. The fluid accumulates underneath the retina, causing the retina to peel away from the back of the eye. A less common type of retinal detachment is called a "tractional" detachment. This occurs when vitreous tugs on the retina over time, gradually causing the retina to tent up off the back of the eye. Tractional detachment does not occur suddenly and are not associated with retinal tears. The third, even less common type of retinal detachment is called an "exudative" detachment in which fluid leaks out of blood vessels within or underneath the retina. This can occur in inflammatory conditions such as uveitis and scleritis, certain collagen vascular or autoimmune diseases, tumors of the eye, and congenital diseases ***(Feldman and Stoppler, 2020).***

Symptoms of retinal detachments may include flashes of light which are most obvious in dim lighting and in patient side vision, sudden appearance of 'floaters' (small, moving spots or specks in the field of vision), visual disturbance such as shadowing in patient side vision or the sensation of a curtain coming over the eye, blurred, cloudy or distorted vision. Floaters are common. If they occur on their own, they are usually not a major cause for concern ***(Codyre, 2020).***

Retinal detachment is a well-known and serious complication following lens surgery. The estimates of the post-surgical incidence of retinal detachment vary greatly in the literature ranging from 0.2 % to 3.6 % ***(Clark, et al., 2012)*** depending on follow-up time and the patient demographics. The risk is generally considered higher in younger myopic patients, following intra capsular surgery and in patients with capsular tear or vitreous loss during surgery ***(Olsen, 2012).***

Ophthalmic nurses can assess a patient's visual potential and his or her capability to function independently. Ophthalmic nurses also help patients overcome psychological obstacles and provide necessary assistance to increase patient independence. Ophthalmic nurses can educate patients on and increase awareness of public resources and available services for the visually

impaired. The most prominent feature unique to ophthalmic nurses is their ability to apply medical and nursing interventions to fulfill visual care requirements. While physicians diagnose diseases, prescribe medication, and perform surgeries, nurses help patients to adapt to new and persistent lifestyle-altering conditions. Therefore, ophthalmic nurses should commit to dedicating themselves to continued learning, which is necessary to develop and maintain the highest standard of care ***(Hadavand, et al., 2013), (Vladan, 2013) & (Moradi, 2016).***

Significance of the study:

The estimated annual incidence of primary rhegmatogenous retinal detachment in Scotland is 12.05 per 100,000. Based on this estimate, there are approximately 7300 new cases annually in the United Kingdom. Rhegmatogenous retinal detachment incidence increases with age, is more common in men and right eyes, and varies between studies from 1 in 10000, and another showing the annual risk of rhegmatogenous retinal detachment to be between 6.3 and 17.9 per 100000 ***(Mitry, et al., 2010).***

In Egypt, a cohort study was established by ***Elnahry, et al., (2019)*** to determine the prevalence of posterior segment manifestations among consecutive patients with pathological myopia attending Cairo University Hospital general ophthalmology clinic which concluded that, retinal detachment was found in 6.3% of eyes and retinal breaks in 4.7%. , followed by tigroid fundus, found in 59.1%. Peripheral lesions were significantly associated with more myopia (P = .02) and longer axial length (P = .046). The commonest peripheral lesion was white without pressure, found in 37.8% of eyes.

Aim of the study

The study aimed to evaluate the effect of an educational program for patients after retinal detachment surgery on their performance and postoperative pain management.

Operational definition

Patients' performance means patients' knowledge and practice.

Research Hypotheses

The following hypotheses were formulated to fulfill the aim of the study

H1: Performance of the study group will be improved post program implementation than the control group.

H2: The study group will be able to manage pain post program implementation than the control group.

H3: There will be significant positive correlation between patients' performance and pain management post program implementation for the study group.

Subjects and Methods

Research design

A quasi-experimental (pre/posttest) design was utilized to achieve the study's aim. Quasi-experimental designs investigated whether there is a causal correlation between independent and dependent variables. Also, the

typical experimental design or randomized controlled trial is identical, but the aspect of random assignment to treatment or control is absent ***(Loewen and Plonsky, 2016).***

Research Setting

The study was conducted in ophthalmology department affiliated to Benha University Hospital, Benha Egypt. The ophthalmology department contains three floors, each floor consists of 10 rooms, a nursing station and physician office, and each room includes 5 beds for patients with ophthalmology problems.

Sample:

A purposive sample of 100 adult patients post retinal detachment surgery were included in this study, and divided randomly into two equal groups (50 study & 50 control groups). **Group I (study group):** consisted of (50) patients who received the educational program along with the routine hospital care. And **Group II (control group):** consisted of (50) patients who received the routine hospital care only. According to the following criteria:

Inclusion criteria:

Patients between the ages of 30–60 years, of both sexes, agreed to participate in the study and able to communicate effectively.

Exclusion criteria:

Patients with physical or mental handicapped, Disoriented and comatosed patients were excluded.

According to statistical office of Benha University Hospital, the total annual admissions of patients with retinal detachment surgery were 135 patients ***(Statistical Office in Benha University Hospital, 2019).*** Sample size was calculated according to the following equation that adopted from ***Yamane, (1967):***

$$n = \frac{N}{1+N\,(e)^2}$$

Where: n = sample size, N= total population size, e = margin error (0.05).

After doing the equation, the sample was (100) patients divided randomly into two equal groups, (50) patients for study group and (50) patients for control group.

Data Collection Tools

Three tools were used to collect data for this study; Patients' knowledge assessment questionnaire, Observational checklist to assess patients' practice regarding eye care & Visual Analogue Pain Scale. They were developed by the researcher after reviewing recent related literature.

Tool I: Patients' Knowledge Assessment Questionnaire:

This tool was developed by the researcher. It was translated into Arabic language after reviewing recent relevant literatures and scientific references. It was adapted from ***Shaw and Lee, (2017).*** It involved the following three parts to cover the following data:

Part (1): is concerned with the assessment of patients' socio-demographic characteristics related to their age, sex, marital status, educational level, occupation, and

current work situation.

Part (2): is concerned with patients' health history. It involved; past medical and surgical history, present health history, and family history.

Part (3): aimed to assess patients' knowledge about retinal detachment surgery. It was adapted from ***Lesin, et al., (2014).*** It consisted of the following sections:

Section I: covered patients' about retinal detachment surgery. It included (7) items related to the definition, types, causes, signs & symptoms, warning signs, treatment and complications.

Section II: covered the studied patients' knowledge about pain management after surgery. It included (5) main items related to operation and anesthesia"5 questions", proper position for operation"3 questions", pain medications"7questions", postoperative eye care and discharge instructions "5 questions".

The questionnaire tool contained (27) questions about retinal detachment surgery. All knowledge items were multiple-choice questions. The patients were asked to reply to these questions with only one correct response for each question pre and post program implementation.

Scoring system:

Two scoring levels for questions were used. The correct answer was scored (1), the incorrect answer, and not known was scored (0). The total score was (27) resulting from adding the total number of questions. Then the result was divided by 100 to be converted into a percentage. Total knowledge score converted into percentage and categorized into:

- ≥70% was considered a satisfactory level of knowledge (19 degrees or more).
- <70% was considered as an unsatisfactory level of knowledge (Less than 19 degrees).

Tool II: Observational checklist to assess Patients'' Practice regarding eye care:

It was aimed to assess patients' practice regarding eye care after retinal detachment surgery. It was adapted from ***Mohamed et al., (2011),*** the checklist included (10) steps related to eye drop instillation (3 steps about handling, storage and administration), eye ointment application (2 steps), and eye exercises (3 steps) and eye compresses (2 steps). Each patient was observed and evaluated and the observation checklist was filled by the researchers.

Scoring system:

Two scoring levels were used: done was scored (1), and not done step was scored (0). The total score was (10), resulting from multiplying the total number of scores, and then the result was divided by 100 to be converted into a percentage. Total practice score converted into percentage and categorized into:

- ≥70% was considered an adequate level of practice (7 scores or more).
- <70% was considered as an inadequate level of practice (Less than 7 scores).

Tool III: Visual Analogue Pain Scale:

It was adopted from ***Griensven, et al., (2013)*** to assess the intensity of pain levels for patients post retinal detachment surgery. The scale composed of (5) items ranged from "no pain" to "worst possible pain ".

Scoring system:

The total scores of visual analogue pain scale ranged from (0-10), the higher scores reflect the worst pain. It was categorized as the following:

- 0 was considered "no pain".
- 1-3 was considered "mild pain".
- 4-6 was considered "moderate pain".
- 7-9 was considered "severe pain".
- 10 were considered "worst possible pain"

Field work:

Ethical considerations: After explaining the study's aim, official permission for data collection was obtained from the director responsible for the ophthalmology department at Benha University Hospital. Verbal consent was obtained from patients to participate in this study after explaining the aim of the study.

Patients were informed about the confidentiality of the obtained information and the nature of the study. They were reassured that the obtained information was used only for the purpose of the study. They have the right at any time to withdraw from the research without providing any reason.

A pilot study was conducted on ten patients (10%) of all patients at ophthalmology department to test the feasibility of the research process, clarity and applicability of the study tools and the educational program, to estimate the time needed for filling the questionnaire, checklist & pain scale, and to identify any possible obstacles that may hinder data collection. Some improvements were made to the developed tools. The patients who were included in the pilot study were excluded from the study sample.

The content validity was done through a panel of five experts in the medical and nursing specialty for face and content validity. Their opinions were requested via an assessment form. The experts were asked to grade each item as "essential," "useful but inadequate," or "unnecessary." According to the panel's judgment on the clarity of sentences and appropriateness of the content, minor modifications were carried out. The consensus among experts regarding the structured interviewing questionnaire was 96% and the observational checklist was 97% for most items. The same experts revised the developed educational program based on the current literature, and all recommended modifications were made. The reliability of the tools has, therefore, been checked using the method of internal consistency. The Cronbach alpha reliability coefficient was (0.975) for the knowledge questionnaire and (0.806) for the observational checklist which proved high.

The researcher developed the educational program after reviewing the related literature. It covered the following information: definition, types, causes, signs & symptoms, warning signs, treatment and complications. It also included information related to operation and anesthesia, proper position

during operation, pain medications, and postoperative eye care and discharge instructions.

The study was conducted through three phases:

Assessment Phase: It was carried out for all studied subjects by the researcher to collect baseline data regarding patients' knowledge & practice about retinal detachment surgery. The researcher attended the clinical setting two days per week during morning shifts. The researcher interviewed each patient after his/her admission to the hospital to collect baseline data on socio- demographic data, medical data and knowledge assessment sheet using **(Tool I).** All the studied patients were observed after retinal detachment surgery using **(Tool II)** before explaining the program. Then, both groups were assessed for pain using **(Tool III).**

The implementation phase included the following steps:

- Setting general and specific objectives.
- Preparation of material covering the reasons behind the session's implementation.
- The researcher dialed with control group firstly to avoid contamination of data then study group.
- The researcher divided the studied patients (study group) into five groups, and each group consisted of ten patients.
- The program implementation was carried out for each group from study group separately through the conduction of sessions according to the studied patients' actual needs assessment.
- The program implementation was conducted in 6 sessions, two sessions per week. Each session lasted about 30 minutes, including periods of discussion according to the patients' progress and feedback.
- Different teaching tools and media were used, including seminars, group discussions, and presentations.
- Sampling and data collection were started and completed during the period from the end of August 2019 till the end of January 2020.
- Each group attended the following sessions:

The first session covered the definition, types, and causes of retinal detachment. The Second session started with a review of the previously presented principles and advancement to the next step, which centered on warning signs and signs & symptoms of retinal detachment. The third session concentrated on potential complications and treatment of retinal detachment.

The fourth session began with reviewing the points that were previously instructed. It focused on the operation, anesthesia, and demonstrating about proper position during operation. The fifth session concentrated on pain medications "its action, indications, preparation, and side effects". The sixth session focused on postoperative application of eye care and discharge instructions.

Evaluation Phase: The evaluation had been made immediately after

implementing the program by using the same tools of the pretest. The researcher reassessed knowledge, practice and pain level to the control group. And, evaluating the effect of implementing the program on knowledge, practice and pain management of the study group by comparing the results pre and post program implementation.

A comparison between both groups study group and control group was done for two times: the first on admission before educational intervention and the second was done after program implementation. Then, comparison was done between the two groups at the end of the study to determine the effect of the educational program for patients post retinal detachment surgery on their performance and postoperative pain management.

Data Analysis

The data collected were structured, tabulated, and statistically analyzed using SPSS (Version 20 of the statistical computer software package). Average and standard deviations were determined for the spectrum of quantitative variables. The number and percentage distribution were computed for qualitative variables. A Chi-square test was used to analyze the relationship between qualitative variables. For interpretation of outcomes of significance, significance was adopted at $p \leq 0.05$, and high statistically significant at $p \leq 0.001$.

Results:

Table (1): shows that, 68% and 66% of the study and control groups aged between 51-60 years with mean age of 51.9 ±11.75 and 50.9±12.23 respectively. As well, 64% and 62% of both groups were males respectively. Also, 96% and 90% of both groups were married respectively. Moreover, 34% and 38% of both groups had primary education respectively. As well, 100% of study group and 92% of control group changed their work respectively.

Table (2): shows that, 68% & 64% of both groups had chronic disease and 70.5% & 75% of them had diabetes mellitus respectively. Moreover, 72% & 68% of both groups had family history of ophthalmic disease respectively. In addition, 74 % and 78% of both groups had a previous ophthalmic operation which was cataract surgery.

Table (3): shows that, 82% and 62% of the study and control groups had intermittent pain respectively. Also, 54% & 56% had moderate & prickling pain respectively. As well, 54% and 60% of both groups had pain after heavy lifting. Moreover, 82% and 60% of both groups relieved their pain by analgesics.

Table (4): shows that, there was high statistically significant difference between study and control groups pre and post program implementation regarding all items of knowledge as observed (P-value = (0.001). **As well,** 96%, 94, and 90% of the study group had incorrect answers about definition, proper position, signs & symptoms, warning signs, and pain medications respectively preprogram implementation, which improved to become correct answers as observed: 98%, 92%, and 68% respectively post program implementation compared to the control group which had no improvement noticed post program implementation for

the same items as observed: 16%, 14%, 6%, and 12% respectively.

Figure (1) illustrates that, there was marked improvement in study group regarding satisfactory level of knowledge from 35% preprogram to 78% post program compared to control group which had no improvement noticed pre and post program implementation.

Table (5): shows that, there was high statistically significant difference between study and control groups post program implementation regarding all items of practice as observed (P-value = (0.001). **As well,** 94% and 90% of the study group didn't perform storage of eye drops and eye ointment application preprogram implementation which improved as observed: 92% and 68% respectively post program implementation compared to the control group which had no improvement noticed post program implementation for the same items.

Figure (2) illustrates that, there was marked improvement in study group regarding adequate level of practice from 24% preprogram to 75% post program compared to control group which had no improvement noticed pre and post program implementation.

Table (6): shows that, there was no statistically significant difference between study and control groups preprogram implementation regarding all items of pain. While, there was high statistically significant differences between them post program implementation. **As well,** 42.0% of the study group complained of severe pain preprogram with mean pain level 7.17 ± 1.81 compared to none of them post program implementation, while, there was no improvement in pain severity among the control group pre and post program implementation.

Table (7): shows that, there was statistically significant relation between total knowledge score of study group with their age as well educational level pre and post-program implementation. While, there was no statistical significant relation between control group with their age as well educational level pre and post-program implementation.

Table (8): shows that, there was statistically significant relation between total practice score of study group with their age as well educational level pre and post-program implementation. While, there was no statistically significant relation between control group with their age as well educational level pre and post-program implementation.

Table (9): shows that, there was no statistically significant relation between pain severity of both groups and their age as well educational level pre and post-program implementation.

Table (10): shows that, there was a statistically significant positive correlation between total pain management score and total performance score among study group post program implementation.

While, there was no statistically significant correlation between total pain management score and total performance score among study group preprogram implementation and control group pre & post program implementation.

Table (1): Distribution of patients (both groups) regarding their socio-demographic characteristics (n=100).

Items	Patient data	Study group n=50		Control group n=50	
		N	%	N	%
Age	30- < 40	5	10.0	9	18.0
	41- < 50	11	22.0	8	16.0
	51- < 60	34	68.0	33	66.0
	Mean ±SD	51.9±11.75		50.9±12.23	
Sex	Male	32	64.0	31	62.0
	Female	18	36.0	19	38.0
Marital status	Widowed	2	4.0	5	10.0
	Married	48	96.0	45	90.0
Educational level	Illiterate	14	28.0	14	28.0
	Primary education	17	34.0	19	38.0
	Secondary education	10	20.0	9	18.0
	University education	9	18.0	8	16.0
Occupational change	Yes	50	100.0	46	92.0
	No	0	0.0	4	8.0

Table (2): Distribution of patients (both groups) regarding their past medical, surgical and family history (n=100).

Items	Medical characteristics	Study group n=50		Control group n=50	
		N	%	N	%
Presence of chronic disease	Yes	34	68.0	32	64.0
	No	16	32.0	18	36.0
	If yes	N=34		N=32	
	Diabetes Mellitus	24	70.5	24	75.0
	Hypertension	6	17.6	7	21.8
	Cardiac diseases	4	11.7	1	3.1
Family history of ophthalmic disease	Yes	36	72.0	34	68.0
	No	14	28.0	16	32.0
Previous ophthalmic operations	Yes	37	74.0	39	78.0
	No	13	26.0	11	22.0
If yes mention the operation	If yes	N=37		N=39	
	Cataract surgery	37	100	39	100

- Some patients choose more than one answer.

Table (3): Distribution of patients (both groups) regarding characteristics of pain pre-program implementation (n=100)

Items	Characteristics of pain	Study group n=50		Control group n=50	
		N	%	N	%
Nature of pain	Intermittent	41	82.0	31	62.0
	Continuous	9	18.0	19	38.0
Degree of pain	Mild	2	4.0	0	0.0
	Moderate	27	54.0	28	56.0
	Severe	21	42.0	22	44.0
Type of pain	Dull	16	32.0	18	36.0
	Aching	7	14.0	4	8.0
	Prickling	27	54.0	28	56.0
Activities that increase pain	Constipation / straining	23	46.0	20	40.0
	Heavy lifting	27	54.0	30	60.0
Alleviating measures of pain	Sitting	3	6.0	11	22.0
	Lying down	6	12.0	9	18.0
	Analgesics	41	82.0	30	60.0

Table (4): Comparison of patients' total knowledge after retinal surgery (both groups) pre and post program implementation (n=100)

Knowledge items	Pre- Program								Post- Program								$X^2$1	p-value	$X^2$2	P-value
	Study group n=50				Control group n=50				Study group n=50				Control group n=50							
	Correct		Incorrect		Correct		Incorrect		Correct		Incorrect		Correct		Incorrect					
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Definition	2	4	48	96	7	14	43	86	49	98	1	2	8	16	42	84	1.05	0.305	24.65	.000**
Types	7	14	43	86	5	10	45	90	38	76	12	24	6	12	44	88	0.201	0.654	12.17	.000**
Causes	12	24	38	76	4	8	46	92	31	62	19	38	5	10	45	90	5.00	0.025*	14.58	.000**
Signs & Symptoms	5	10	45	90	3	6	47	94	34	68	16	32	3	6	47	94	0.39	0.531	24.75	.000**
Warning Signs	5	10	45	90	5	10	45	90	34	68	16	32	6	12	44	88	0.00	1.000	17.28	.000**
Treatment	8	16	42	84	4	8	46	92	30	60	20	40	5	10	45	90	5.00	0.025*	49.56	.000**
Complications	6	12	44	88	6	12	44	88	41	82	9	18	7	14	43	86	0.00	1.000	28.87	.000**
Operation & Anesthesia	22	44	28	56	7	14	43	86	33	66	17	34	3	6	47	94	1.76	0.310	14.09	.000**
Proper Position	3	6	47	94	2	4	48	96	46	92	4	8	7	14	43	86	0.213	0.644	22.79	.000**
Pain Medications	5	10	45	90	5	10	45	90	34	68	16	32	6	12	44	88	0.00	1.000	17.28	.000**
Postoperative Eye care	8	16	42	84	4	8	46	92	30	60	20	40	5	10	45	90	1.56	0.210	13.09	.000**
Discharge Instructions	6	12	44	88	6	12	44	88	41	82	9	18	7	14	43	86	0.00	1.000	28.87	.000**

$X^2$1 between study and control group pre-program. **$X^2$2** between study and control group post- program.

High statistically significant at (p≤0.001) ** **x^2=chi-square test**

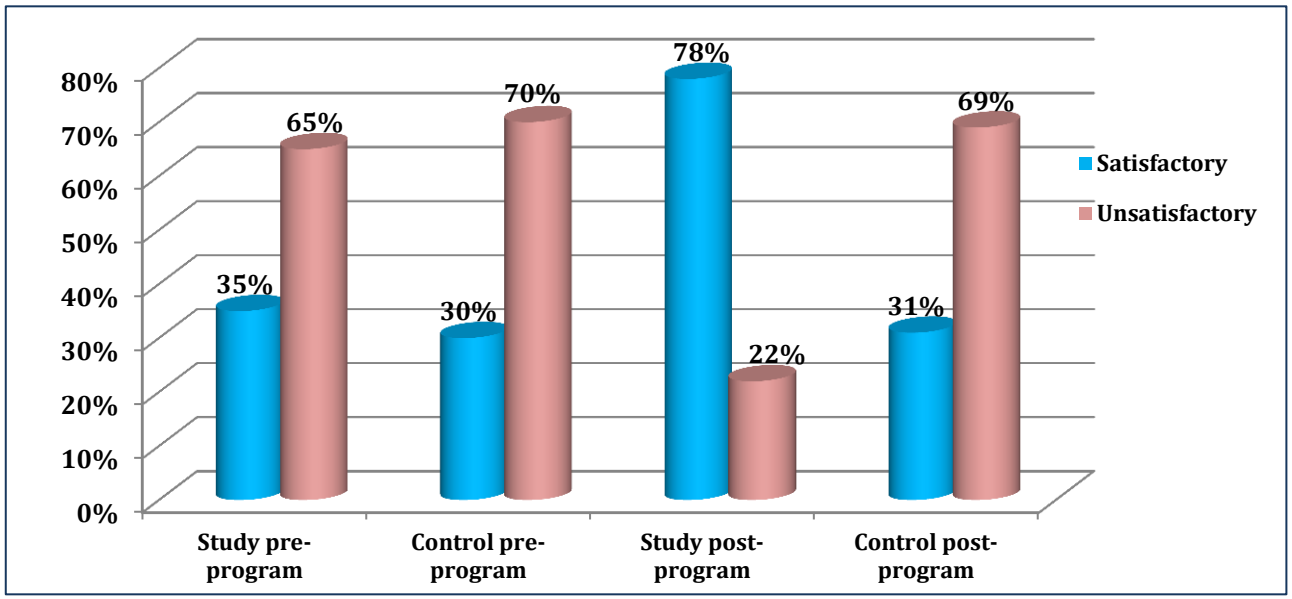

Fig (1): Distribution of patients after retinal surgery (both groups) regarding their total knowledge score pre and post program implementation (n=100)

Table (5): Comparison of patients' total practice after retinal surgery (both groups) pre and post program implementation (n=100)

Practice items	Pre- Program								Post- Program								$X^2$1	p-value	$X^2$2	P-value
	Study group n=50				Control group n=50				Study group n=50				Control group n=50							
	Done		Not done		Done		Not done		Done		Not done		Done		Not done					
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Eye drop installation (handling)	6	12	44	88	6	12	44	88	41	82	9	18	7	14	43	86	0.00	1.000	28.87	.000**
Eye drop installation (administration)	22	44	28	56	6	12	44	88	33	66	17	34	7	14	43	86	1.56	0.210	13.09	.000**
Eye drop installation (storage)	3	6	47	94	2	4	48	96	46	92	4	8	5	10	45	90	0.213	0.644	22.79	.000**
Eye ointment application	5	10	45	90	5	10	45	90	34	68	16	32	6	12	44	88	0.00	1.000	17.28	.000**
Eye exercise	8	16	42	84	4	8	46	92	30	60	20	40	5	10	45	90	1.56	0.210	13.09	.000**
Eye compresses	6	12	44	88	6	12	44	88	41	82	9	18	7	14	43	86	0.00	1.000	28.87	.000**

$X^2$1 between study and control group pre-program. **$X^2$2** between study and control group post- program.

High statistically significant at (p≤0.001) ** **x^2=chi-square test**

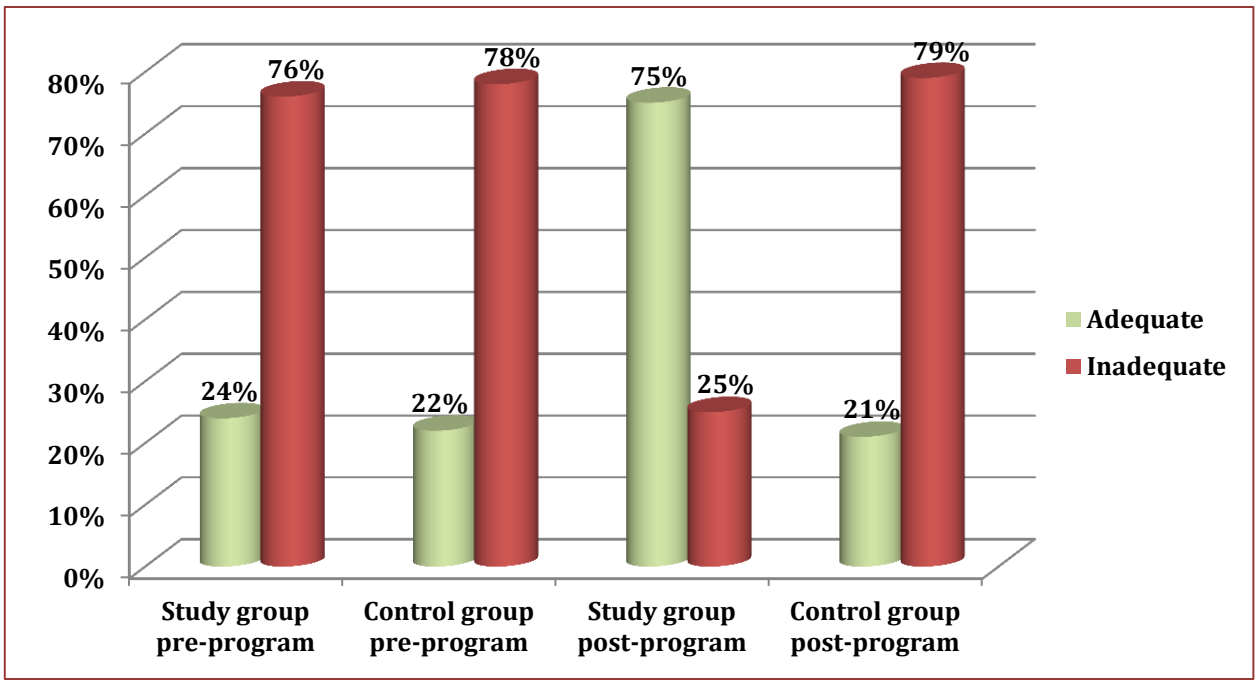

Fig (2): Distribution of patients after retinal surgery (both groups) regarding their total Practice score pre and post program implementation (n=100)

Table (6): Comparison between patients after retinal surgery (both groups) regarding their pain severity pre and post program (n=100)

Pain severity	Pre- Program				Post- Program				$X^2$1	p-value	$X^2$2	P-value
	Study group n=50		Control group n=50		Study group n=50		Control group n=50					
	N	%	N	%	N	%	N	%				
Mild	2	4.0	0	0.0	43	86.0	5	10.0	0.821	.663	47.26	.000*
Moderate	27	54.0	28	56.0	7	14.0	26	52.0				
Severe	21	42.0	22	44.0	0	0.0	19	38.0				
Mean ±SD	7.17±1.81		7.12±1.97		2.15±1.16		7.05±2.01					

$X^2$1 between study and control group pre-program. **$X^2$2** between study and control group post- program.

High statistically significant at (p≤0.001) ** **x^2=chi-square test**

Table (7): Relation between total knowledge score of both groups and their age & educational level pre & post program implementation (n=100)

Items	Patient data	Total Knowledge Score																$X^2$1 p-value	$X^2$2 p-value	$X^2$3 P- value	$X^2$4 P-value
		Pre- Program								Post- Program											
		Study group n=50				Control group n=50				Study group n=50				Control group n=50							
		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory		Unsatisfactory					
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Age	30- < 40	6	12	8	16	4	8	6	12	6	12	3	6	4	8	6	12	0.324 0.005*	0.39 0.531	6.41 0.005*	1.56 0.210
	41- < 50	14	28	10	20	13	26	15	30	24	48	5	10	13	26	15	30				
	51- < 60	8	16	4	8	6	12	6	12	10	20	2	4	6	12	6	12				
Educational Level	Illiterate	3	6	1	2	2	4	2	4	3	6	1	2	2	4	2	4	0.093 0.005*	.775 .555	0.052 0.005*	1.951 .581
	Primary education	14	28	9	18	13	26	15	30	24	48	3	6	13	26	15	30				
	Secondary education	8	16	6	12	2	4	6	12	8	16	2	4	2	4	6	12				
	University education	6	12	3	6	4	8	6	12	6	12	3	6	4	8	6	12				

$X^2$1 between total knowledge score with age and educational level of study group preprogram.
$X^2$2 between total knowledge score with age and educational level of control group preprogram.
$X^2$3 between total knowledge score with age and educational level of study group post-program.
$X^2$4 between total knowledge score with age and educational level of control group post-program.
Statistically significant at (p≤0.05*) **x^2=chi-square test**

Table (8): Relation between total Practice score of both groups and their age & educational level pre & post program implementation (n=100)

Items	Patient data	Total Practice Score																$X^2$1 p-value	$X^2$2 p-value	$X^2$3 P-value	$X^2$4 P-value
		Pre- Program								Post- Program											
		Study group n=50				Control group n=50				Study group n=50				Control group n=50							
		Adequate		Inadequate		Adequate		Inadequate		Adequate		Inadequate		Adequate		Inadequate					
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Age	30- < 40	8	16	2	4	2	4	6	12	8	16	2	4	2	4	6	12	.885 0.005*	.775 .555	0.093 0.005*	1.951 .581
	41- < 50	16	32	13	26	4	8	16	32	26	52	3	6	4	8	16	32				
	51- < 60	8	16	3	6	6	12	16	32	8	16	3	6	6	12	16	32				
Educational Level	Illiterate	3	6	3	6	2	4	2	4	3	6	1	2	2	4	2	4	0.028 0.005*	0.39 0.531	0.025 0.005*	1.56 0.210
	Primary education	14	28	3	6	13	26	15	30	24	48	1	2	13	26	15	30				
	Secondary education	14	28	3	6	2	4	6	12	10	20	1	2	2	4	6	12				
	University education	8	16	2	4	4	8	6	12	8	16	2	4	4	8	6	12				

$X^2$1 between total Practice score with age and educational level of study group preprogram.
$X^2$2 between total Practice score with age and educational level of control group preprogram.
$X^2$3 between total Practice score with age and educational level of study group post-program.
$X^2$4 between total Practice score with age and educational level of control group post-program.
Statistically significant at (p≤0.05*) **x^2=chi-square test**

Table (9): Relation between pain management of both groups and their age & occupation pre and post-program implementation (n=100).

Pain Severity																										
Items	Patient data	Pre- Program												Post- Program										$X^2$1 p-value	$X^2$2 p-value	$X^2$3 P-value	$X^2$4 P-value
		Study group n=50						Control group n=50						Study group n=50						Control group n=50							
		Mild (2)		Moderate (27)		Severe (21)		Mild (0)		Moderate (28)		Severe (22)		Mild (43)		Moderate (7)		Severe (0)		Mild (5)		Moderate (26)		Severe (19)					
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Age	30- < 40	0	0.0	3	11.1	6	28.5	0	00.0	9	32.1	7	31.8	3	6.9	0	0.0	0	0.0	0	0.0	8	30.7	1	5.2				
	41- < 50	2	100	15	55.5	12	57.1	0	00.0	14	50.0	12	54.5	25	58.1	7	100	0	0.0	5	100	13	50.0	11	57.8	4.03 >0.05	7.61 >0.05	0.74 >0.05	12.48 >0.05
	51- < 60	0	0.0	9	33.3	3	14.3	0	00.0	5	17.8	3	13.6	15	34.8	0	0.0	0	0.0	0	0.0	5	19.2	7	36.8				
Educational Level	Illiterate	0	0.0	2	7.4	1	4.7	0	00.0	3	10.7	1	4.5	3	6.9	1	14.3	0	0.0	1	20	3	11.5	1	5.2				
	Primary Education	2	100	16	59.2	12	57.1	0	00.0	15	53.5	7	31.8	25	58.1	3	42.8	0	0.0	4	80	12	46.1	11	57.8				
	Secondary Education	0	0.0	6	22.2	3	14.3	0	00.0	6	21.4	2	9.1	10	23.2	3	42.8	0	0.0	0	0.0	4	15.3	7	36.8	3.89 >0.05	10.37 >0.05	1.88 >0.05	11.98 >0.05
	University Education	0	0.0	3	11.1	5	23.8	0	00.0	4	14.3	12	54.5	5	11.6	0	0.0	0	0.0	0	0.0	7	26.9	0	0.0				

$X^2$1 between pain score with age and educational level of study group preprogram.
$X^2$2 between pain score with age and educational level of control group preprogram.
$X^2$3 between pain score with age and educational level of study group post-program.
$X^2$4 between pain score with age and educational level of control group post-program
Statistically in-significant at (p>0.05) statistically significant at (p≤0.05*) x^2=chi-square test

Table (10): Correlation between total performance score and total pain management score among study and control groups pre and post program implementation (n=100)

Items	Pain management							
	Study				Control			
	Pre		Post		Pre		Post	
	r	p-value	r	p-value	r	p-value	r	p-value
Knowledge	0.120	0.470	0.360	0.030*	0.190	0.250	0.120	0.470
Practice	4.030	0.675	0.585	0.001**	3.890	0.869	1.880	0.755

Statistically in-significant at (p>0.05) statistically significant at (p≤ 0.05*) high statistically significant at (p<0.001)**

Discussion

Rhegmatogenous retinal detachment results from sub retinal fluid accumulation underneath the retina after a retinal break. The detachment starves the retina of nourishment, with resultant damage to photoreceptors over time. If the central macula is involved, vision loss occurs that recovers to a variable degree after successful reattachment. This visual recovery correlates best with presenting visual acuity but has proved difficult to predict **(Goldman, 2018).**

The present study aimed to evaluate the effect of an educational program for patients after retinal detachment surgery on their performance and postoperative pain management. The study hypothesized that performance of the study group will be improved post program implementation than the control group; the study group will be able to manage pain post program implementation than the control group. Also, there will be significant correlation between patients' performance and pain management post program implementation for the study group.

The present study showed that nearly two thirds of the study and control groups aged between 51-60 years with mean age of 51.9 ±11.75 and 50.9±12.23 respectively. From the researcher point of view, this may be due to the fact that retinal detachment occurs with old age.

This result was agreed with Pandya, (2018), who stated in his research entitled "Which age groups have the highest prevalence of retinal detachment?" that retinal detachment usually occurs in persons aged 40-70 years. This result was incongruent with Poulsen, et al., (2016), who studied "Epidemiologic characteristics of retinal detachment surgery at a specialized unit in Denmark" showed that, the highest incidence of retinal detachment was in patients aged 60 to 79 years.

In addition, **Lesin, et al., (2014)**, mentioned in their study entitled " Postoperative pain in complex ophthalmic surgical procedures: comparing practice with guidelines" that the average age of patients was 67 years.

Also, the present study showed that, nearly two thirds of both groups were males. This result was in the same line with **Poulsen, et al., (2016),** who reported in their study that the highest incidence of retinal detachment was among males. Also, **Gong, et al, (2019),** who studied "Gender Differences in Case Volume among Ophthalmology Residents", mentioned that the majority of participants were males.

In addition**, Callaway, et al., (2020),** had conducted a retrospective cohort study entitled "Sex differences in the repair of retinal detachments in the United States" revealed that, women are less likely to undergo surgical intervention than the insured men.

Concerning marital status, the present study revealed that the majority of both groups were married. This result was in agreement with **Zheng, et al., (2013),** who conducted a study entitled "Marital status and its relationship with the risk and pattern of visual impairment in a multi-ethnic Asian population", mentioned that, more than three quarters of the studied patients were married.

Concerning educational level, the present study revealed that, more than one third of both groups had primary education. This result was in disagreement with **Joshua, et al., (2016),** who stated in their study entitled "Awareness and knowledge of emergent ophthalmic disease among patients in an internal medicine clinic" that, more than half of participants earned a high school diploma or a community college or 2-year associate's degree.

Concerning occupational change, the present study revealed that the entire study group and the majority of control group changed their work after disease; this result was supported by, **Eghrari, (2020),** who studied guidelines for successful recovery after eye surgery which illustrated that patient post-surgery, should limit strenuous activities, avoid dust and irritants, and avoid swimming and driving.

The present study showed that, more than two thirds of both groups had chronic disease and about three quarters of them had diabetes mellitus. Moreover, more than two thirds of both groups had family history of ophthalmic disease. This may be due to old age and also high blood sugar can lead to problems like blurry vision, cataracts, glaucoma, and retinopathy. In fact, diabetes is the primary cause of blindness in adults from 20 to 74 years.

These results were in agreement with **Daien, et al., (2015),** who reported in their study entitled "Incidence, Risk Factors, and Impact of Age on Retinal Detachment after Cataract Surgery in France" that, risk factors for retinal detachment onset include high myopia, capsular rupture, history of eye trauma, male gender, and diabetes.

Also, **Haug and Bhisitkul., (2012)** emphasized in their study which was about "Risk factors for retinal detachment following cataract surgery" that, severe myopia, retinal tears, trauma, family history, as well as complications from cataract surgery are risk factors for retinal detachment.

Moreover, this result was supported by **Bisinotto, et al., (2016),** whose study was about "The pre-anesthetic evaluation for ophthalmic surgery in the elderly is really necessary? The reality of a public hospital" clarifiesd that, the majority of participants had suffered from at least one chronic disease. The most prevailed illness was uncontrolled systemic arterial hypertension, type II diabetes with no proper management. Glycaemia above100 mg.dl was undiagnosed in about one quarter of patients.

In addition, nearly three quarters of both groups had previous ophthalmic operation which was cataract surgery. This result was in the same line with **Mitry, et al., (2011),** who reported in their study entitled "The predisposing pathology and clinical characteristics in the Scottish retinal detachment study" that, risk factors for retinal detachment include myopia, male gender, diabetes mellitus, and previous cataract surgery on the eye.

Concerning pain assessment, the present study revealed that, the majority of the study and control groups had intermittent pain. More than half of both groups had moderate & prickling pain. And, the majority of both groups relieved their pain by analgesics.

These results were in the same line with **Astley, (2017),** who reported in his article entitled "How painful is a retinal detachment surgery?" that, the surgery itself is not painful because it's done under anesthesia, but for a few days after the surgery the eye can be very sore. It feels like someone is sticking pins into the eyes all the time that can be managed with pain killers, so it's bearable. In addition, **Lesin, et al., (2014),** reported that, after surgery, the majority of patients received only one dose of analgesics.

Concerning total knowledge score preprogram implementation, the present study illustrated that, nearly two thirds of the study group had unsatisfactory level of knowledge preprogram implement-tation. This result was in agreement with **Joshua et al., (2016),** who reported that, levels of awareness and knowledge regarding emergent ophthalmic diseases are low.

Concerning total knowledge score post program implementation, the present study illustrated that more than three quarters of the study group had satisfactory level of knowledge post program implementation. This result may be due to the effect of the educational program in improving patients' knowledge. This result was supported by **Gray, et al., (2010),** who mentioned in their study entitled "Preliminary survey of educational support for patients prescribed ocular hypotensive therapy" that, after providing educational support, patients who received more information achieved significant higher knowledge scores than those who received less information.

Concerning total practice score pre & post program implementation, the present study illustrated that three quarters of the study group had adequate level of practice post program implementation compared to control group which had no improvement noticed pre and post program implementation. From the researcher point of view, this finding might be referred to that patients gained new knowledge and skills that enabled them to be competent during their practice.

This result was supported by **Mohamed, et al., (2011),** who studied "Impact of an educational program on knowledge, beliefs, practices and expectations about care among adolescent glaucoma patients in Cairo" showed that, the educational program had significantly improved patients' eye care practices in terms of handling, storage and administration of topical therapy.

Concerning pain severity pre and post program implementation, the present study illustrated that more than two fifths of the study group complained of severe pain preprogram with mean pain level 7.17 ± 1.81 compared by none of them post program implementation. This may be referred that the educational program had positive effect in decreasing severity of pain.

These results were supported by the study of **Massicotte, et al., (2018),** which was about "Postoperative Pain Management in Vitreoretinal Surgery for Retinal Detachment: A Systematic Review of Randomized Controlled Trials" concluded that, better

postoperative pain scores were achieved after active treatment.

Regarding relation between total knowledge score of study and control groups and their age & educational level pre & post program implementation, the present study revealed that, there was statistically significant relation between total knowledge score of study group with their age as well educational level pre and post-program implementation. While, there was no statistically significant relation between control group with their age as well educational level pre and post-program implementation.

These results were in the same line with **Aldebasi, et al., (2018),** who reported in their study entitled "Public Awareness regarding the Differences between Ophthalmologists and Optometrists among Saudi Adults Living in Riyadh: A Quantitative Study" that, there was a significant association between satisfactory knowledge and age older than 26 as well higher level of education.

Also, **Charteris, et al., (2010),** emphasized in their stud entitled "The Epidemiology and Socioeconomic Associations of Retinal Detachment in Scotland: A Two-Year Prospective Population-Based Study" that, the strongest association between retinal detachment and educational achievement.

Regarding relation between total practice score of study and control groups and their age & educational level pre & post program implementation, the present study revealed that, there was statistically significant relation between total practice score of study group with their age as well educational level pre and post-program implementation. While, there was no statistical significant relation between control group with their age as well educational level pre and post-program implementation.

These results were supported by **Mohamed, et al., (2011),** who mentioned in their study that, there was high statistically significant relation between patients' practice pre & post program implementation. Also, emphasized that the program significantly improved patients' knowledge and practices concerning eye care.

Concerning relation between pain severity of study and control groups and their age & occupation pre and post-program, the current study illustrated that, there was no statistically significant relation between pain severity of both groups and their age as well educational level pre and post-program implementation.

These results agreed with **Malon, et al.,(2018),** who studied "Characterizing the demographics of chronic pain patients in the state of Maine using the Maine all payer claims database" stated that, neither education level nor income were associated with the prevalence of chronic pain.

On contrary, **Nahin, (2015),** reported in his study entitled "Estimates of Pain Prevalence and Severity in Adults: United States, 2012" that, associations were seen between pain severity and selected demographic variables including race, ethnicity, preferred language, sex, and age.

Concerning correlation between total pain management score and total

performance score among study and control groups pre and post program implementation, the present study revealed that, there was statistically significant positive correlation between total pain management score and total performance score among study group post program implementation.

This result was in agreement with **Fletcher, et al., (2016),** who mentioned in their study entitled "The relationship between knowledge of pain neurophysiology and fear avoidance in people with chronic pain: A point in time, observational study" that, people with higher knowledge level may provide an effective strategy to help manage fear avoidance and related disability in the chronic pain population in order to improve treatment outcomes.

Moreover, **Lee, et al., (2016),** emphasized the same results in their study entitled "Does changing pain-related knowledge reduce pain and improve function through changes in catastrophizing?" that, improvement in knowledge level regarding pain biology was significantly associated with a reduction in pain intensity.

Conclusion

The current study concluded that, performance of the study group post program implementation has been greatly improved concerning pain management after retinal detachment surgery that supports the first and second research hypothesis. Also, there was a significant positive correlation between patients' performance and pain management post program implementation for the study group that supports the third research hypothesis.

Recommendations

The present study recommended to emphasize conducting in-service training programs periodically and regularly to teach patients self-care skills after retinal detachment surgery. In addition, Innovative educational programs about eye diseases are needed to improve patients' knowledge and practices. Also, repeating the study on a high probability sample to achieve generalization of the findings. Moreover, further research should be conducted to evaluate effectiveness of training programs on patients' health outcomes.

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