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Application of Educational Multi - Model Preparation Package on Knowledge and Anxiety among Patients Undergoing Diabetic Retinopathy Treatment

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Article Info

Abstract

Background: Diabetic retinopathy is the most common microvascular complication of diabetes that considers a highly specific neurovascular complication of both type1 and type 2 diabetes. As the disease progresses, it may evolve into proliferative diabetic retinopathy, which is defined by the presence of neovascularization and has a greater potential for serious visual consequences. Hyperglycemia results in damage to retinal capillaries. This weakens the capillary walls and results in small outpunching's of the vessel lumens, known as micro aneurysms. **Aim of the study**: The study aimed to evaluate the effect of Application of Educational Multi -Model Preparation Package on Knowledge and Anxiety among Patients Undergoing Diabetic Retinopathy Treatment for the first time. **Subjects and Method:** A convenient sample of 50 patients are included. **Research design**: The present study was utilized a quasi- experimental research design. **Setting:** This study conducted in ophthalmology departments at Tanta Main University Hospital. **Tools:** two tools were used for data collections. **Tool (I)** Structured Interview questionnaires sheet: It was comprising two parts as follows: **Part 1:** Patients' Socio-demographic data, **Part 2:** Patient's Clinical data and family history. **Part 3:** Patient's Knowledge Assessment Questioners sheet **Tool (II) State-Trait Anxiety Inventory scale**. **Result:** The results found that, there is a significant difference and improving in total knowledge score, anxiety trait score pre and post intervention P=0.00 **Conclusions:** The multimodal education prepared package improves patient's knowledge and reduced anxiety State-Trait before diabetic retinopathy so this method is recommended for preparation of patients for diabetic retinopathy.

Key words: Multimodal package, Anxiety, Retinopathy treatment

Introduction

Diabetes Mellitus is among the leading causes of death, disability, and economic loss throughout the world [1]. The global prevalence of diabetes mellitus is predicted to increase dramatically in the coming decades, from an estimated 382 million in 2013 to 592 million by 2035 [1,2]. Patients with diabetes suffer from many life-limiting and life-threatening complications including macrovascular related stroke, ischemic heart disease, and peripheral artery disease and/or microvascular-related retinopathy, neuropathy, and nephropathy [3,4].

Diabetic retinopathy (DR) is the most common microvascular complication of diabetes and although is a highly specific neurovascular complication of both type1 and type2 diabetes, the prevalence of which strongly correlates to both the duration of diabetes and level of glycemic control.[4] Diabetic retinopathy is a burgeoning problem globally and currently affects almost 100 million people worldwide and is set to become an ever increasing health burden, with estimates between 1990 and 2010 showing that DR related visual impairment and blindness increased by 64% and 27%, respectively [6].

The global prevalence of Diabetic retinopathy for the period of 2015–2019 was 27%. Due to increasing life expectancy of persons living with DM and ageing of the population, the prevalence of DR is expected to increase [7]. The prevalence of DR in Egypt is understudied and various prevalence estimates have been provided using diverse methodologies and in different populations studied. For instance, **Alsawahli et al., (2019)** showed that 42% of patients with diabetes in households had retinopathy, while a hospital-based study in 2021 in the Egyptian capital, Cairo, showed that DR was found in 20.5% of patients with diabetes[8].

The presence and progression of DR is associated with significant increases in health costs [9-16].World Health Organization aims to stimulate and support the adoption of effective measures for the surveillance, prevention and control of diabetes and its complications, particularly in low and middle-income countries [17]. As a part of this, WHO (2022) conducts surveillance of diabetes and its risk factors and also started to celebrate the World Diabetes Day (November the 14th of each year); to build awareness on the global epidemic of diabetes [18]. The most relevant risk factors for the development of DR are disease duration, a poor glycemic control (high HbA1c levels), and the presence of hypertension. Other risk factors for DR include higher body mass index, and pregnancy, renal impairment, as well as cataract surgery [19].

Diabetic retinopathy is classified into two main classes, nonproliferative and proliferative. The word "proliferative" refers to whether or not there is neovascularization (abnormal blood vessel growth) in the retina early disease without neovascularization is called nonproliferative diabetic retinopathy (NPDR). As the disease progresses, it may evolve into proliferative diabetic retinopathy (PDR), which is defined by the presence of neovascularization and has a greater potential for serious visual consequences. Hyperglycemia results in damage to retinal capillaries. This weakens the capillary walls and results in small outpouchings of the vessel lumens, known as microaneurysms. Microaneurysms eventually rupture to form hemorrhages deep within the retina, confined by the internal limiting membrane (ILM). The weakened vessels also become leaky, causing fluid to seep into the retina. Fluid deposition under the macula, or macular edema, interferes with the macula's normal function and is a common cause of vision loss in those with DR [20, 21].

The Treatment options of DR are Vitrectomy and intravitreally injected steroids and anti-vascular endothelial growth factor which can halt the progress of neovascularization, Laser Treatment, Photocoagulation for diabetic retinopathy is performed with the use of a variety of ophthalmic lasers. The technological advances in this field have made efficient laser equipment that can deliver effective treatments in both clinical set up as well in operating theatre. Retinal laser photocoagulation is a standard treatment of diabetic retinopathy [22]. Laser energy may be applied to the retina either through the dilated pupil using a contact lens or the indirect ophthalmoscope, or externally through the sclera. Also transpupillary laser is normally applied

using the slit lamp bio-microscope and a contact lens. The superiority of the modern wide-angled contact lenses has made use of 3 mirror contact lens very infrequent in clinical practice [22].

Panretinal photocoagulation is a treatment for proliferative diabetic retinopathy in which hundreds of laser burns are applied to the retina in order to retard the growth of new abnormal blood vessels. Laser positioning accuracy is important; for example, inadvertent photocoagulation of a vein can cause vein occlusion [23].

Grid photocoagulation involves similar application of a pattern of laser burns, over a smaller area, and is used to treat macular edema [24]. Focal photocoagulation is a another treatment for macular edema in which leaking blood vessels in the retina are directly targeted in order to seal the leaks; laser positioning accuracy is of obvious importance for efficacy [25]. The vast majority of diabetic patients who lose vision do so, not because of an inability to treat their disease, but due to lack of awareness. Raising awareness about DR is an important element for early diagnosis and treatment of this blinding disease [26-32]. To control or prevent vision loss, appropriate health education is necessary to encourage those at risk to seek timely and appropriate care [23]

Multimodal education package consists of patients` instructions, educational pamphlet and film, orientation round that could be effective in improving health' condition. While in this study Multimodal could be explained around the use of more than one mode of communications in a text to create meaning that include oral and written language, visual, gestural, tactile and spatial representations for a diabetic retinopathy patient. Patients` education and appropriate preparation would positively affect health promotion, awareness, attitudes, skills and behaviors. Education can reduce patients` anxiety, increase coping with health condition and decrease length of hospital stay [33].

Encourage patients with DM but without DR to have annual screening eye exams. Inform patients that effective treatment for DR depends on timely intervention, despite good vision and no ocular symptoms. Educate patients about the importance of maintaining near-normal glucose levels, near-normal blood pressure and to control serum lipid levels. Communicate with the general physician (e.g., family physician, internist, or endocrinologist) regarding eye findings. Provide patients whose conditions fail to respond to surgery and for whom treatment is unavailable with proper professional support (i.e., offer referrals for counseling, rehabilitative, or social services as appropriate). Refer patients with reduced visual function for vision rehabilitation and social services [34, 35].

Lack of knowledge about methods of diagnosis and   treatment is one of the major causes of anxiety [36-38]. The risk of developing stress is 50% to 100% higher among patients with diabetes compared with the general population. The prevalence of developing anxiety disorders among those with diabetes is also considerably higher. Proper education and counseling for patients with diabetes not only can help diminish their related fears, anxieties, and depression but also can help them understand their disease and obtain better control of their glucose levels. Because retina specialists often treat a high number of patients with diabetes, it is crucial to understand the barriers and comorbidities related to this patient population [5].

A recent Health watch report emphasized the importance of interim support for patients on the waiting list, which can help keep them get well and get them ready for surgery. Patients waiting for major procedures will be given extensive support from dedicated care giver teams to make sure they are fighting fit for surgery [36].

Multimodality is described as an interdisciplinary approach drawn with an emphasis on communication and representation. Multiple modes of representation include capabilities of combinations of oral and written language, visual, gestural, tactile and spatial representations. This transitional shift from print-based education to multimodal education indicates the need to rethink how teaching and learning is conceived, approached and practiced. [33]

The purpose of this study is to evaluate the effect of Application of Educational Modules about Multi -Model Preparation Package on Knowledge and Anxiety among Patients Undergoing Retinopathy Treatment.

Significant of the study:

It was found that patients who had retinopathy treatment represented more than 70% of total procedures performed every month in ophthalmology departments at Tanta University Hospital. (Statistical of department) [38]. Recent estimates in Egypt showed that 55.7 percent of diabetic patients with type 2 diabetes have retinopathy (Said & Hamed, 2021). Major life changes are among factors that cause anxiety, and one of these changes is surgery. Hospitalization, regardless of disease, is known to provoke anxiety in the patient admitted for surgery. Patients with high levels of anxiety require higher doses of anesthetic induction agents and recover poorly. If unrecognized, prolonged anxiety creates stress which may subsequently harm the patient and delay recovery [39]

Till now, two types of interventions for preoperative anxiety are identified pharmacological and non-pharmacological. Pharmacological interventions include sedatives and anti-anxiety drugs. Midazolam, diazepam, ketamine, and fentanyl are the most common anxiolytics [28]. As pharmacological treatments have adverse effects such as breathing problems, drowsiness, interfering with anesthetic drugs, and prolonged recovery, non-pharmacological interventions are becoming more commonly used. It is reported that non-pharmacological interventions are more commonly used by anesthesiologists compared to pharmacologic ones in both pediatric and adult anesthesia procedures. On the other hand, a preoperative educational intervention is an interactive procedure that focuses on improving patient self-care and self-efficacy after surgery and is usually conducted by a nurse [13].

Aim of the study

To evaluate the effect of application of educational Multi -Model preparation package on knowledge and anxiety among patients undergoing diabetic retinopathy treatment.

Research hypothesis:

a- Patients undergoing retinopathy treatment who receive their multi-modal

   preparation package exhibit improved mean score of knowledge.

b- Patients undergoing retinopathy treatment who receive their multi-modal

   preparation package exhibits reduced level of anxiety scores.

Operational Definition of Multimodal:

Multimodal refers to the use of more than one mode of communication in a text to create meaning that include oral and written language, visual, gestural, tactile and spatial representations.

Materials and Methods

Design: The present study was utilized A quasi-experimental research.

Setting: This study conducted in ophthalmology departments at Tanta University Hospital which suited on 4th floor and consists of 4 wards each ward contains 8 patients' beds, and 5th floor (Economic) that consists of 3 wards each ward contains 6 patients' beds.

Subjects: A convenience sample of 50 patients were included in the study. They were selected according to the following criteria.

Inclusions Criteria:

* Adult patient 21- 60 years

* Both sexes.

* Diabetic patients.

* Undergoing Retinopathy Treatment for the first time.

Exclusions Criteria:

* Any cognitive impairment of the patient by history or during explanation of consent procedure.

 * History of hospitalization for Retinopathy Treatment.

* Psychological problems e.g., hallucinations or anxiety disorders.

*Unconscious (Glasgow coma scale).

Tools*:* Two tools were used for data collection they accomplished after reviewing the recent relevant literatures [7-12].

Tool (I): Patients' Structured Interview questionnaires sheet:

It was comprised of three parts:

Part 1: Patients' Socio-demographic data characteristics: That includes patient, code, gender, age, marital status, level of education, residence, occupation,

Part 2: Patients' Clinical data: it was concerned with, history of hospitalization**,** previous eyes diseases, and family history of diabetes, as evident from patients fills. smoking, type of diabetes mellitus, type of therapy, date of diagnosis, hypertension, cardiovascular disease, nephropathy, cerebrovascular disease, heart rate, respiration rate, blood pressure assessment and BMI.

Part 3 : "Patients' knowledge assessment related to diabetic retinopathy": It comprises 20 questions about knowledge of the patients related to, diabetes, complications of diabetes on the retina, risk factors of diabetic retinopathy, definition of retinopathy, types of retinopathy, its treatment, importance of keep the blood glucose under control all time, discharge plan post-surgery, recovery, activity limitations, hygiene, proper way to instill eye drops, proper use of the eye patch and eyes shield, methods to avoid constipations and straining, return to work after retinopathy treatment. This tool was used pre & post implementation of multi-modal preparation package.

Scoring: A total score was 40 marks. The right and complete answer take score two while the uncompleted answer takes score one and wrong answer or no answer take score zero. The 40 marks were distributed through its three parts: Knowledge about the diabetes, complications of diabetes on the retina was 6, knowledge about the Retinopathy and its treatment was 12, knowledge about discharge plan after eye surgery 22. Score less than 50% of total score was considered poor, from 50% to less than 75% was considered fair, and from 75% and more was considered good.

Tool II. A psychometric State-Trait Anxiety Inventory scale: The scale the "State-Trait Anxiety Inventory" was developed by (**Spielbergr C D 1985** and *Adapted in Arabic* by Abdullatif Q A 2004), it was designated to measure the anxiety level. The inventory scale consists of two separate scales, each of which consisted of the 20 items of the Likert type scale.[40]

The state anxiety scale determines how the individual feels at a particular moment and under certain circumstances. The scale is designed in quadruple Likert-type scale varying between never", "sometimes", "usually", and "almost always".

The trait anxiety scale determines how the individual generally feels, independent of the status and the conditions which surround him/her on a quadruple -point Likert-type scale, ranging between "never", "sometimes", "usually", and "almost always". Both scales can be introduced at the same time. In this case, the state anxiety scale was given first, and then the trait anxiety scale. The scales include inverted statements.

The scores obtained from both scales range from 20 to 80. High scores indicate elevated anxiety levels, and low scores indicate lower anxiety levels. State and trait anxiety scores range from 20 to 80. Patients who acquire a score in the range of 0-20 will experience no anxiety. A score in the range of 21 to 40 was considered as low anxiety, 41 to 60: moderate anxiety and 61 to 80: severe anxiety.

Methods:

1. An official permission to carry out the study through an Official letter clarifying the purpose of the study was addressed to the Dean of Faculty of Nursing. Then, the permission was obtained from the hospital administrative authority.

2. ***Ethical & administration considerations***

-Ethical approval was obtained from ethical committee at Faculty of Nursing, Tanta University (code: 185-12-2022.

 - Informed consent was obtained from the patients after explanation of the study purpose.

- They were also assured of their anonymity and the confidentiality of their responses.

- Anonymity of patients was assured in the sheets.

- Respecting the right of the patients to withdraw at any time during the data collection period.

-The study was not causing harm for patients.

 -The study was implemented from August 2022 and December 2022.

3. ***Validity of tools:*** all tools were tested for content validity by a jury composed of five experts in field of Medical Surgical Nursing, and Psychiatric Mental Health Nursing professional staff Members From Faculty of Nursing, accordingly needed modifications were done, it was calculated and found to be 97%.

4. Reliability of the tools: the reliability of the study tools was calculated by using Conbach's alpha test, tool 1 was = 0.987 tool 2 was found 0.988.

5. Pilot Study: a pilot was carried out on 10% of the study subjects to ascertain the clarity and applicability of the study tools and to identify obstacles that might be faced during data collection. Modifications were done by the researcher before the main study. Those subjects were excluded from the actual study sample.

Field work:

An actual study was divided into five phases*:*

 1- Preparatory Phase*:* - The patient admitted early in the morning at the ophthalmology department, in the waiting room. The selected patients who meet the inclusion criteria were asked to participate in the study after establishing rapport and trusting relationship and explaining the aim of the study.

 *2-***The assessment phase:**

 -All patients were assessed socio-demographic and clinical data from the patient's medical record and family history from the patients using tool I part one and two.

-knowledge assessment for the diabetic retinopathy patient was done using tool I part three, two times one before application of module package and the other after application.

Vital signs: including blood pressure, pulse rate, and respiration rate were recorded an hour before (pre-intervention) and after (post intervention), using a vital sign record sheet write under preparatory phase why repatriation.

 -Anxiety Participants' state and trait anxiety was measured an hour before (pretest) and (posttest) after intervention, using the Anxiety Inventory scale using tool II.

 -The selected patients were undergoing a pre-test using Patient's vital signs including blood pressure, pulse rate, and respiration rate were recorded by the researchers. Interview knowledge questioner and state & trait anxiety scale questions were used on an individual basis by the researchers.

 3-Planning Phase*:* In this phase planning was formulated for each patient's based on assessment phase and literature review, Priorities and patients expected outcome was formulated, illustrated pamphlet, and an educational pamphlet also was formulated to be distributed to each patient in implementation phase. The researcher prepared videos, power point and pictures to be used in the patient education. The content validity of the vedio and the educational pamphlet was confirmed by four faculty members of Faculty of Nursing, two ophthalmologist from the ophthalmology department.

4-Implementation phase*: A clear and simple explanation was offered to patients. The patient education was implemented by the researchers after the review of related literature and its content included: The educational sessions which includes the following**: -**

a. **The multi-modal preparation package involve:** videos, power point and pictures, has been implemented for patients in individually approach according to the patients' assessment to ensure their understanding and then provided each patient designed illustrated pamphlet. During this interview, retinopathy treatment was explained to them.

b. **The patients were provided by an educational pamphlet** about the process of treatment and pre & post after package post-surgery care along with some explanations.

c. **The power point 10 minutes** to illustrate, diabetic retinopathy, risk factors, treatment of retinopathy and discharge plan. The pictures 5 minutes of different parts of the laser surgery unit and a 7-minute video describing the environment of the unit, the process of laser surgery, pre and immediate after care implementation, and experiences of a patient who had undergone laser surgery were shown to the patients.

d. **Deep breathing exercises** were taught and demonstrated by the researchers and re-demonstrated by the patient. Finally, the researcher answered their questions. Each patient takes as pre - package 5 minutes interviews, 5 minutes vital signs, 5 minutes deep breathing exercise,5 minutes a psychometric state-trait anxiety inventory scale, approximately 45 minutes for pre and post implementation.

5-Evaluation Phase: Each patient was evaluated, pre & immediate post package implementation for their knowledge using tool I part 3, and evaluate, anxiety level both state & trait using tool II, were used two times, pre and immediate post implementation phase.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 26, SPSS Inc)

Chicago, IL, USA). For quantities data, the range mean and standard deviation were calculated. For comparison between means of two groups of parametric data of independent samples, t-test was used. For comparison between more than two means of parametric data, F value of ANOVA test was calculated (White, & SE, 2019). For correlation between variables was evaluated using pearson's correlation coefficient (r). Significance was adopted at $P < 0.05$ for interpretation of results of tests of significance, highly significance was adopted at $P < 0.001$ for interpretation of results of tests of significance.

Results and Discussion

Table (1): Percent distribution of the studied diabetic patients according to their socio–demographic characteristics.

Characteristics	The studied diabetic patients (n=50)	
	N	**%**
Age (in years)		
▪ 18-<40	14	28.0
▪ 40-<50	15	30.0
▪ 50-<60	11	22.0
▪ ≥ 60	10	20.0
Gender		
▪ Male	28	56.0
▪ Female	22	44.0
Educational level		
▪ Illiterate	23	46.0
▪ Primary	3	6.0
▪ Secondary	7	14.0
▪ University/Higher	17	34.0

Residence		
▪ Rural	17	34.0
▪ Urbane	14	28.0
▪ Suburban	19	38.0
Marital status		
▪ Married	36	72.0
▪ Single	7	14.0
▪ Divorced	1	2.0
▪ Widow	6	12.0
Occupation		
▪ Hand worker	23	46.0
▪ Employee	7	14.0
▪ Education field	9	18.0
▪ Health field	4	8.0
▪ Electronic field	7	14.0

Table (1): Shows distribution of the studied patients according to their socio-demographic characteristic. Regarding the age, less than half of the studied patients 15 (30%) aged from (40-50). Regarding the gender of the studied patients about more than half 28 (56%) were males. As regard marital status more than two third of patients (72%) were married. Regarding residence it was found that more than one third 19 (38%) from suburban. Regarding level of education less than one half of the studied patients 23(46%) illiterates.

Table (2): Comparison of vital signs among studied sample with diabetic retinopathy pre \post intervention.

Vital signs		Pre (n=50)		Post (n=50)		χ^2	P
		N	%	N	%		
Heart rate	60-70	4	8	0	0	31.579	**0.00***
	71-80	26	52	50	100		
	81-90	20	40	0	0		
Respiration	12-16	38	76	50	100	13.636	**0.00***
	17-20	12	24	0	0		
Systolic blood pressure	100 -120	6	12	0	0	14.943	**0.001***
	< 120- 130	37	74	50	100		
	<130-140	7	14	0	0		
Diastolic blood pressure	80-90	50	100	50	100		

* Significant at P<0.05.

Table (2): Shows the comparison of vital signs among studied patients undergoing retinopathy treatment, pre \ post intervention. The results found that, the significant difference and improving in vital signs as regarded, heat rate, respiration, and systolic blood pressure between pre \ post P=00.0,0.00and 0.001 respectively

Table (3): Percent distribution of the studied diabetic retinopathy patients according to their clinical data.

Clinical data	The studied diabetic patients (n=50)	
	N	%
Smoking	34	68.0

	N	%
BMI :		
Normal weight.	4	8.0
Overweight.	13	26.0
Obesity Class 1	14	28.0
Obesity Class 2	15	30.0
Obesity Class 3	4	8.0
Pertinent Medical History		
▪ Obesity	46	98.0
▪ Cardiovascular disease	18	36.0
▪ Hypertension	33	66.0
▪ High cholesterol	16	32.0
Type of therapy for diabetes mellitus		
▪ Orally	15	30.0
▪ Orally & Insulin	35	70.0
Family history of diabetes		
▪ Yes	42	84.0
▪ No	8	16.0
Consanguinity for history of diabetic retinopathy		
▪ Yes	42	84.0
▪ No	8	16.0
Date of diagnosis (in years)		
▪ < 5	9	18.0
▪ (5-10)	28	56.0
▪ > 10	13	26.0

Table (3): Shows distribution of the studied patients according to their clinical data. Regarding the obesity distribution of the studied patients, the majority of the studied patients 46 (98%) were obese. Regarding the type of diabetic therapy of the studied patients about more than two third 35 (70.0%) treated orally and by insulin. As regarding date of diagnosis, more than one half 28 (56.0%) were diagnosed from 5 to 10 years.

Table (4): Percent distribution of the studied diabetic patients according to their total knowledge items about retinopathy pre \ post intervention.

Items	The studied patients (n=50)				$\div^2$ p
	Pre		Post		
	N	%	N	%	
1. Biggest barrier for not getting eye screening					
▪ Lack knowledge about diabetic retinopathy	16	32.0	16	32.0	0.00
▪ Cost/Insurance	23	46.0	23	46.0	1.00
▪ Fear of discovery	11	22.0	11	22.0	
2. Risk factors for diabetic retinopathy					
▪ Incorrect	15	30.0	0	0.0	**100.00**
▪ Incomplete correct	35	70.0	0	0.0	**0.00***
▪ Complete correct	0	0.0	50	100.0	
3. Symptoms of diabetic retinopathy					
▪ Incorrect	36	72.0	0	0.0	**100.00**
▪ Incomplete correct	14	28.0	0	0.0	**0.00***
▪ Complete correct	0	0.0	50	100.0	
4. Types of diabetic retinopathy					
▪ Incorrect	50	100.0	0	0.0	**100.00**
▪ Incomplete correct	0	0.0	5	10.0	**0.00***
▪ Complete correct	0	0.0	45	90.0	

5. Symptoms that require emergency and required visit to ophthalmologist.					
▪ Incorrect	16	32.0	0	0.0	**100.00**
▪ Incomplete correct	34	68.0	0	0.0	**0.00***
▪ Complete correct	0	0.0	50	100.0	
6. Visit to the ophthalmology department annual.					
▪ 1ncorrect	18	36.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	32	64.0	50	100.0	
7. Satisfied with knowledge.					
▪ < 5 Poor	50	100.0	0	0.0	**FE**
▪ ≥ 5 Good	0	0.0	50	100.0	**0.00***
8. Proper way to instill eye drops					
▪ 1ncorrect	42	84.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	8	16.0	50	100.0	
9. Proper way to use eye patch and eye shield					
▪ 1ncorrect	45	90.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	5	10.0	50	100.0	
10. Avoid scratching, rubbing, touching, or squeezing.					
▪ 1ncorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	0	0.0	50	100.0	
11. Measures can be used to avoid constipation and straining, and activity limitations					
▪ 1ncorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	0	0.0	50	100.0	
12. Symptoms that should be reported to the physician, including eye pain.					
▪ 1ncorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	0	0.0	50	100.0	
13. Wear sunglasses with side shields in outdoor					
▪ 1ncorrect	47	94.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	3	6.0	50	100.0	
14. Photophobia post eye surgery.					
▪ 1ncorrect	48	96.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	2	4.0	50	100.0	
15. Time needs for visions stabilize post eye surgery.					
▪ 1ncorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	0	0.0	50	100.0	
16. Overcoming the problems of the eye pre stable the vision					
▪ 1ncorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	0	0.0	50	100.0	
17. Reassurance about visual acuity post-surgery?					
▪ 1ncorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	0	0.0	50	100.0	

18. Health education about control of blood sugar. Diet, exercises and medications					
▪ 1ncorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Correct	0	0.0	50	100.0	
19. Complications of diabetic retinopathy.					
▪ Incorrect	50	100.0	0	0.0	**FE**
▪ Incomplete correct	0	0.0	0	0.0	**0.00***
▪ Complete correct	0	0.0	50	100.0	

FE: Fisher' Exact test   (*) Significant at level P < 0.05.

Table (4): Show the comparison between total knowledge items about retinopathy pre \ post intervention. Significant difference was emphasized about, risk factors for diabetic retinopathy, symptoms of diabetic retinopathy, types of diabetic retinopathy, symptoms that require emergency and required visit, the Symptoms that should be reported to the ophthalmologist, overcoming the problems of the eye before stable the vision, the measures that can be used to avoid constipation and straining, and activity limitations, the proper way to use eye patch and eye shield and measure to avoid scratching, rubbing, touching, or squeezing the affected eye of diabetic retinopathy between pre \ post P=00.0,0.00

Table (5): Percent distribution of the studied diabetic patients according to the trait and state anxiety levels about retinopathy pre \ post educational module

Trait and state Anxiety levels	The studied patients (n=50)				$\div^2$
	Pre		Post		P
	N	%	N	%	
A. Trait anxiety level					
▪ No anxiety	0	0.0	3	6.0	
▪ Low anxiety	0	0.0	47	94.0	**100.00**
▪ Moderate anxiety	38	76.0	0	0.0	**0.000***
▪ Severe anxiety	12	24.0	0	0.0	
B. State anxiety level					
▪ No anxiety	0	0.0	4	8.0	
▪ Low anxiety	0	0.0	46	92.0	**100.00**
▪ Moderate anxiety	38	76.0	0	0.0	**0.000***
▪ Severe anxiety	12	24.0	0	0.0	

(0-20) No anxiety.   (21– 40) Low anxiety

(41– 60) Moderate anxiety.   (61– 80) Severe anxiety.

(*) Significant at level P < 0.05.

Table (5): Shows distribution of the studied diabetic patients according to the trait and state anxiety levels about retinopathy pre \ post educational module. There were significant differences and improvement between pre \post education P= 0.000

Figure 1: Distribution of the studied patients in relation to their total knowledge mean score, trait anxiety score and state anxiety score pre \ post education.
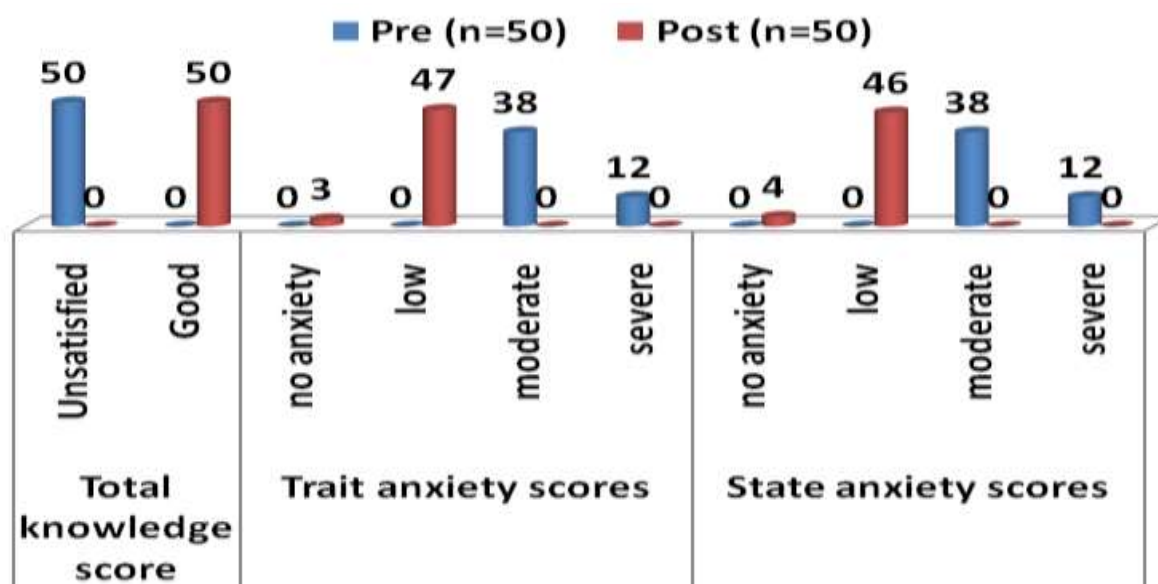
Figure 1: Illustrated distribution of the studied patients in relation to their total knowledge score, anxiety trait score and anxiety state score pre and post intervention. It was found that significant differences and improvement was between pre \ post education, total knowledge score was good in 50%, trail anxiety score and state anxiety score found low post 47% and 46% respectively, while no anxiety represented in trait anxiety and state anxiety3% and 4% respectively.

Table (6): Relationship of socio-demographic characteristics of studied diabetic patients with the total mean score of knowledge about retinopathy pre/post intervention

Characteristics	Total mean knowledge score			
	Pre	F/t P	post	F/t P
Age (in years)				
▪ 18-<40	31.79±2.190		54.14±1.231	
▪ 40-<50	31.87±2.295	0.545	54.00±1.195	0.869
▪ 50-<60	32.45±2.423	0.654	54.73±1.272	0.464
▪ ≥ 60	32.90±2.923		54.50±1.354	
Gender				
▪ Male	31.96±2.202	0.511	54.25±1.295	0.100
▪ Female	32.45±2.650	0.478	54.36±1.217	0.753
Residence				
▪ Rural	31.53±2.322		54.00±1.275	
▪ Urbane	31.93±2.129	1.728	54.21±1.251	1.202
▪ Suburban	32.95±2.549	0.189	54.63±1.212	0.310
Marital status				
▪ Married	32.19±2.482		54.44±1.252	
▪ Single	32.00±2.582	0.207	54.14±1.464	0.718
▪ Divorced	34.00±0.00	0.891	54.00±0.00	0.547
▪ Widow	32.00±2.098		53.67±1.033	
Occupation				
▪ Hand worker	33.00±2.153		54.70±1.105	
▪ Employee	31.00±2.887		53.57±1.397	
▪ Education field	29.89±1.054	**4.652**	53.33±1.00	**3.396**
▪ Health field	32.75±2.217	**0.003***	54.75±0.50	**0.016***
▪ Electronic field	33.29±1.976		54.71±1.380	
Educational level				
▪ Illiterate	33.00±2.153		54.70±1.105	
▪ Secondary	30.67±1.155	2.125	52.67±0.577	**3.854**
▪ Community college	31.00±2.887	0.110	53.57±1.397	**0.015***
▪ University/Higher	31.82±2.404		54.35±1.169	

Smoking					
▪ Yes	32.00±2.243	0.595	54.00±1.155	**6.857**	
▪ No	32.56±2.732	0.444	54.94±1.237	**0.012***	
BMI					
▪ (18.5-<25) Normal weight	33.29±1.890		54.71±1.380		
▪ (25- <30) Overweight	33.00±2.614		54.62±1.193		
▪ (30-<35) Obesity Class 1	30.77±1.691	2.044	54.08±0.954	0.867	
▪ (35-<40) Obesity Class 2	32.14±2.507	0.104	53.93±1.439	0.491	
▪ ≥40 Obesity Class 3	32.33±3.055		54.67±1.528		

(*) Significant at level P < 0.05.

Table (6): Show the relationship of socio-demographic characteristics of studied diabetic patients with the total mean score of knowledge about retinopathy pre/post intervention. There were significant differences and improvement between pre \ post education as regarding, occupation, smoking, educational level P= 0.016, 0.012, 0.015 respectively.

Table (7): Correlation between total knowledge main score, trait anxiety score and state anxiety score.

Items		Total knowledge score			
		Pre		Post	
		R	**P**	**R**	**P**
Trait anxiety scores	Pre	0.304	**0.032***	0.031	0.830
	Post	0.149	0.303	0.347	**0.014***
State anxiety scores	Pre	0.304	**0.032***	0.031	0.830
	Post	-0.037	0.799	0.147	0.307

Table (7) shows Correlation between total knowledge score, trait anxiety score and state anxiety score. It was observed that there is significant positive correlation between pre total knowledge score and pre trait anxiety score and state anxiety score. Also, significant and positive correlation between was existed post total knowledge score and post trait anxiety score.

Discussion

Diabetic retinopathy is a common complication of diabetes and is a major cause of vision impairment and blindness in productive age worldwide.[35] Diabetic retinopathy remains a major threat to sight in the working-age population in the developed world.[36] Appropriate educations by these nurses could reduce physical ailments, help patients cope with disease, decrease their lengths of stay and postoperative pain medication, increase patient and family member satisfaction with the process, and improve prognosis. [37].

However, the pre management also deserves a differentiated care by the multidisciplinary team, especially by nurses, who are responsible for preparing the patient and giving them advice; nurses are closer to the patients at this time [38].

The results of the socio-demographic data showed that the majority of patients were between forty and fifty years of age patients and more than one half were male and more than two third were married. This result was parallel with the study done by Singh et al., (2022)[41], in their recent study titled "Awareness of diabetic retinopathy among diabetes mellitus patients visiting a hospital of North India" illustrated that more than half of patients were in the age group of 40 to 50 years. In the same context, it was clear from this study finding that about more than half of the patients were males. This is inconsistent with Alsawahli et al., (2021)[40], whose study entitled "Population-based cross-sectional prevalence survey of diabetes and diabetic retinopathy in Sohag - Egypt" and reported that the prevalence of DM in females was significantly higher than in males.

Regarding cigarette smoking is a major contributor to coronary heart disease, stroke, retinopathy and peripheral vascular disease even though smokers tend to be thinner and to have lower blood pressure than nonsmokers [41]. Also, individuals with diabetes mellitus, especially those whose diabetes occurs in adult life or family history of diabetes mellitus, have an increased incidence of coronary heart disease and retinopathy. Those who have slightly elevated blood sugar levels but do not have detectable diabetes also have an increased risk of developing these problems [42]. This

agrees with this study which reported that the prevalence of diabetic retinopathy risk factors was: diabetes mellitus, hypertension and smoking were more than two third. Vital signs are the physiological indicators that change in stressful   situations such as hospitalization or waiting for surgery. Different studies have suggested various methods to reduce preoperative anxiety [41].

Results of this study indicate that the heart rate, respiration, and blood pressure reduction are observed after education a 6% reduction in anxiety was seen. Some studies reported satisfactory results post 20 to 40 minutes of therapy [43, 44].

In the same context, it was clear from the study finding that a majority of the patients were obese. This is consistent with Rajput et al., (2016)[45] whose study entitled Nurse-led diabetic retinopathy screening: a pilot study to evaluate a new approach to vision care for Canadian Aboriginal peoples and reported that the prevalence of obesity in patients were significantly higher. This may be related to most of the patients were diagnosed with diabetes for more than 5 years.

Additionally, about more than one half of the studied patients had hypertension. This result agrees with Kolahdooz et al., (2017)[46], whose study Prevalence of overweight and obesity among indigenous populations in Canada: a systematic review and meta-analysis and reported that the Aboriginal people are also burdened with higher rates of cardio-metabolic risk factors such as hypertension, which may indicate future risk for cardiovascular morbidity and mortality.

Findings from the current study confirm this trend and are disconcerting because these cardiovascular co-morbidities left untreated can lead to heart attack, stroke and kidney damage. As such, the validation of these results illustrates the need for renewed vigilance to develop a wide range of community-led, culturally relevant health promotion and primary prevention activities for peoples.

As regarding to total knowledge of studied patients, this study result score post education was higher than the score pre education with a highly statistically significant difference. This may be due to instructions prevention had improved patients, knowledge regarding the effect of glycemic control and risk factors of diabetic retinopathy, importance of annually eye checkup on prevention of diabetic eye complications and preserve theirs vision. This finding is supported by Hosseini et al., (2021)[47], whose study titled "The effect of educational program based on theory of planned behavior on promoting retinopathy preventive behaviors in patients with type 2 diabetes" and their results of the pre-test showed that the patients' information about retinopathy was very weak. While, after intervention the majority of patients had improved information.

Patients' anxiety has several causes. In a recent study, anxiety pre invasive procedure is related to both concerns about inter current events and/or complications during or after the procedure, diagnosis and a possible poor prognosis [48-53]. Other issues can also increase the incidence   of anxiety, patients mentioned absence of companions, first time they are submitted to the procedure, lack of information and/or satisfactory orientation, and especially waiting time are important determinants of anxiety [54].

Rees et al., (2016)[55]   reported that exposure to previous surgery would not decrease preoperative anxiety. While other studies found conflicting results regarding the association between exposure to previous surgery and preoperative anxiety [56]. Furthermore, Wojujutari et al., (2019)[57] found a non-significant association between previous experience of surgery and preoperative anxiety.This results were agreed with finding of the current study which pointed on high percentage of the patients had knowledge. The waiting time pre retinopathy treatment is directly proportional to anxiety episodes and levels, i.e., the greater the waiting time, the higher the anxiety level [58]. There are studies showing anxiety levels of relatives or companions during the waiting period, it is the similar to anxiety pre surgical procedures [58]. Information provided to patients is inversely proportional to anxiety: the lesser the amount of information, the greater the anxiety [59].

The previous studies have shown that the video using for patient education underwent retinopathy treatment was helpful in the reduction of anxiety. In addition, studies demonstrated that method of sensory information was more effective than conventional methods in preparing the patients to procedures. It was showed that the video education given the patients before the retinopathy management reduces anxiety and stress effectively [60]. In the study of **Tanimura et al.,** (2018)[61], found that, the video education was increase the satisfaction and information of the patients. In this study, the state anxiety which is indicative of instantaneous worry and stress, has been shown to be reduced by education given to patients. Therefore, in the preparation of patients

to the retinopathy management, should be known that anxiety and stress of the patients may be effectively reduced by the assistant health personal via audio-visual (video) education other than medical preparation pre the procedure. The concept of pre procedural anxiety, particularly retinopathy treatment, has far-reaching importance to nursing practice. Professional nurses act as educators are in a critical position to make an impact in the lives of patients experiencing vision specific anxiety. Given the potentially of serious complications associated with untreated anxiety, precise and timely diagnosis is warranted, which rarely occurs as a part of assessment in a pre-procedural unit or eyes clinic. Patients with high levels of anxiety need to be identified preoperatively and offered interventions directed to reduce anxiety associated complications [61]. This is supported by **Grieken et al.,(2018)**[62], whose study entitled Face-to-face and online psycho-educational nursing interventions for anxiety management: an integrative review of the literature and reported that the Nursing professionals in face-to-face pycho-educational interventions has shown efficacy in the reduction of anxiety on patients, it is likely that it will also do so in online education.

This study examined the impact of a patient preparation package on anxiety level of the patients undergoing retinopathy treatment and showed the effectiveness of the preparation package in reduction of anxiety. Considering the beneficial effects of this method, application of this preparation package is highly recommended to reduce anxiety of the patients before retinopathy management. In the study to determine the effect of informing patients about diagnosis procedures on their anxiety, we found in this study that the, total knowledge score unsatisfied in all patient pre intervention, also Treat anxiety scores and state anxiety scores found in all patients pre education, it may be illustrated that these patients were in the first time for retinopathy treatment. In a recent study, anxiety before retinopathy treatment is related to both concerns about inter current events and/or complications during or after the procedure, diagnosis and a possible poor prognosis [62].

The waiting time pre retinopathy treatment is directly proportional to anxiety episodes and levels, i.e., the greater the waiting time, the higher the anxiety level [63]. Separation from the patient is the greatest source of anxiety [64]. Also information provided to patients is inversely proportional to anxiety: the lesser the amount of information, the greater the anxiety [63]. The patients increase anxiety out of being unaware of what the result of the procedure and concerned with the process because it may be painful [62]. This result are contradicted with **Kamran et al., (2017)**[63] who found that did not find any relationship between the rising in the abnormal coronary angiographic findings and anxiety; they also found that although female patients had less CAD, their anxiety level was significantly higher found in their study that the mean anxiety scores showed statistically significant differences among the groups and these difference was originated from among the groups that consisted of healthy individuals and patients who did not have any serious diabetic retinopathy. Also Almalki et al., (2017)[64], found that the elevated levels of preoperative anxiety have serious outcomes and can increase the risk of postoperative complications such as pain, prolonged recovery, longer hospitalization, and death.

Conclusion

Based on the findings of the presented study, it can be concluded that, the preparation package has positive effect on patient's knowledge, and anxiety pre\post retinopathy treatment. Considering the beneficial effects of this preparation package on improving knowledge and reducing anxiety. Based upon existing evidence and international practice.

RECOMMENDATION

Preoperative education should be incorporated into routine practice to prepare retinopathy patients undergoing treatment.

a. Patient education material should be prepared sensory- or procedural-oriented.

b. Procedural material should be illustrating the steps involved in the retinopathy treatment.

c. Sensory information should focuses on what the patient will see, hear, feel, smell or taste during the procedure which understanding of what to expect during the procedure.

d. Information can be presented through multimodal Medias such as written pamphlets and videos.

Acknowledgment

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