Retinopathy Prevention Educational Sessions on Awareness of Adult Diabetic Patients in Al-Ramad Hospital , Port Said

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Received: 29/07/2024

Revised:08/08/2024

Accepted:06/12/2024

ABSTRACT

Background: Retinopathy is known as one of the most severe complications of diabetes and a leading cause of blindness worldwide. **Aim**: explore the effect of retinopathy prevention educational sessions on the knowledge, attitude and practice of adult diabetic patients. **Design**: a quasi-experimental research design with a pre/post-test approach. **Setting**: the study was conducted in Al-Ramad Hospital , Port Said**. Sampling**: purposive sample of 67 diabetic patients who were at the medical outpatient clinics. **Tools**: three tools were used : tool one was a structured interviewed questionnaire that assessed patients' socio-demographic characteristics, medical, surgical, therapeutic , family history ,and knowledge about diabetic retinopathy. Tool two : evaluate the patient's attitude about retinopathy prevention. Tool three: reported practice about retinopathy prevention. **Results**: According to this study, 40.3% of the patients had ages between 40 and 50. Patients' pre-test knowledge of diabetic retinopathy was inadequate, but after the instructional sessions, it increased. Following their attendance at the health education courses, diabetic individuals' practices and attitudes greatly improved. **Conclusion**: There was a highly statistically significant improvement in patient's knowledge, attitude and reported practice toward diabetic retinopathy after implementation of preventive educational sessions compared to prior to attending the sessions. **Recommendation**: health educational sessions for patients to raise diabetic patients' knowledge regarding retinopathy prevention for a longer period of time in different settings.

Keywords: Diabetic patients - Educational sessions - Retinopathy prevention

Retinopathy, one of the leading causes of blindness worldwide, is a terrible side effect of diabetes. One potentially blinding consequence of diabetes mellitus (DM) is diabetic retinopathy (DR). It is linked to a decline in life quality and productivity and may result in further socioeconomic hardship. According to the Centers for Disease Control and Prevention (CDC), over one-third of persons with diabetes over 40 have high prevalence of diabetic retinopathy. 4.2 million adults with diabetic retinopathy and 655,000 with diabetic retinopathy that posed a risk to their vision (Barsegian, Kotlyar, Lee, Salifu, & McFarlane, 2017) .

Damage of the retina's tiny blood vessels results in diabetic retinopathy. Diabetes can cause this to malfunction, leak, or get obstructed, which can eventually impair vision by altering the flow of oxygen and nutrients to certain areas of the retina (Jebaseeli, Durai, & Peter, 2019). Blockages in the retina can lead to the growth of abnormal blood vessels on the surface, increasing the risk of bleeding and liquid leaks. In the latter phases, such structural alterations may even cause retinal detachment and/or glaucoma in addition to early vision impairment. Almost all patients with type I diabetes and over 60% of individuals with type II diabetes will acquire retinopathy within the first 20 years of the condition. (Almalki, Almalki, & Alswat, (2018).

According to Hammoudi et al. (2021) there are a number of risk factors for diabetic retinopathy that have been found, including the type of diabetes, family history, length of diabetes mellitus, age, sex, glycemic control, hypertension, body mass index, smoking, serum lipids, and presence of blood clots.Early indications of diabetic retinopathy include hazy or spotty vision, floaters—forms that appear in the field of vision—gradually decreasing eyesight, sudden vision loss, eye pain or redness, and problems seeing in the dark (Shah, & Bixler, 2019).

There are four stages of diabetic retinopathy. In the first, known as mild non-proliferative diabetic retinopathy (NPDR), tiny swellings resembling balloons called micro-aneurysms develop in the blood vessels that supply the retina with fluid (Dutta, Manideep, Basha, Caytiles, & Iyengar, 2018).In the second stage of the disease, known as moderate non-proliferative diabetic retinopathy (Chowdhury & Meem, 2020), blood vessels that are vital to the retina's nourishment may swell and lose their capacity to carry blood, which could result in diabetic macular edema, or swelling in

the macular region of the retina, which could seriously impair vision. Sometimes, first and second are combined to form "early" NPDR (Shalini, & Sasikala, 2018).

In the third phase in cases of severe non-proliferative diabetic retinopathy, the retina's blood flow is compromised, which exacerbates blood vessel destruction. Proliferative Diabetic Retinopathy (PDR), the final stage of diabetic retinopathy, is characterized by the retina's secretion of substances that promote cell growth, leading to the formation of new blood vessels within the retina and in the vitreous gel, the jelly-like fluid that fills the center of the eye. These new blood vessels may bleed or leak due to their fragility, leaving scar tissue that may induce retinal detachment. (Ong, & Fawzi, 2022).

One of the potential consequences of diabetic retinopathy is vitreous hemorrhage, which can result in the appearance of floaters in the vitreous fluid due to the bleeding of new blood vessels. Blood can fill the vitreous cavity and totally obstruct vision in cases of severe vitreous hemorrhage. In most cases, this temporary loss of vision resolves in a few of weeks or months, excluding retinal injury (Crabtree & Chang, 2021). The development of scar tissue from damaged blood vessels causes retinal detachment, which pulls the retina away from the back of the eye and may cause floaters or flashes of light to appear (Love, 2019). Glaucoma: Due to diabetic retinopathy, new blood vessels to grow in the front of eye, interfering with the normal flow of fluid out of the eye and lead to damage in the optic nerve (Kattar, Concheiro, & Alvarez-Lorenzo, 2021).

To avoid this dangerous side effect of diabetes mellitus, diabetic patients should attend yearly retinopathy screenings, learn how to control their blood pressure, cholesterol, and blood sugar, and receive support for managing their diabetes (Watson et al., 2021). For those who are at risk to be encouraged to seek timely and appropriate care, appropriate education is required. Furthermore, this calls for creating educational resources that are suited for the location and culture while taking into account the information, attitudes, and behaviors that are currently prevalent in the community (Khalaf et al., 2019).

Community health nurses have a crucial part in the management and prevention of long-term conditions like cancer, diabetes, respiratory disorders, and

cardiovascular disease. They gather information on the patients' families and the useful sociocultural and economic aspects while creating interventional plans because they are the most dependable and first point of contact with the patients, Reports for public health care activities, especially home visits , conducting counseling or as early detection in overcoming existing health problems so that they do not become a bigger problem (Suprapto, & Lalla, 2021). Encourage diabetic patients for healthy life style , appropriate nutrition for diabetes mellitus and diabetic retinopathy , quitting smoking , regular and moderate exercise , regular eye screening and immediate contact with ophthalomologist if noticing eye pain or pressure or any changes in the vision (Beaser , Turell,& Howson,2018).

Significance of the study

According to International Diabetes Federation in 2019, The prevalence of Diabetes Mellitus and Diabetic Retinopathy in Egypt, ranked Egypt the ninth among countries with the highest numbers of adults (aged 20–79) with diabetes mellitus, this is expected to shift up to eighth in 2030 and seventh in 2045, and ranked the third among the countries of the Eastern Mediterranean Region (EMR) with a prevalence of diabetes mellitus reaching up to 17.2% .

A few studies have been conducted regarding the knowledge and awareness about diabetic retinopathy among the diabetic population. The study by Khalaf et al., (2019) . Patients with sight-threatening retinopathy may need educational sessions regarding a potential loss of vision as well as a clear explanation of the treatment options. (Elshemy, Ibrahim, & Elkazeh, 2018).

So the aim of the study was to explore the effect of retinopathy prevention educational sessions on awareness of adult diabetic patients in Al-Ramad Hospital , Port Said.

AIM OF THE STUDY

Explore the effect of retinopathy prevention educational sessions on awareness of adult diabetic patients in Al-Ramad hospital , Port Said .

Objectives of the study

1. Identify knowledge of adult diabetic patients about diabetic retinopathy
2. Determine attitude of adult diabetic patients about diabetic retinopathy .
3. Identify reported practice of adult diabetic patients about diabetic retinopathy .
4. Design retinopathy prevention educational sessions on awareness of adult diabetic patients
5. Implement retinopathy prevention educational sessions on awareness of adult diabetic patients .
6. Evaluate the effect of retinopathy prevention educational sessions on awareness of adult diabetic patients in Al-Ramad hospital , Port Said .

Research hypothesis

H1: The adult diabetic patient's knowledge, attitude, and practice would be improved after implementation of retinopathy prevention educational sessions in Al-Ramad hospital , Port Said .

SUBJECTS AND METHODS

A. Technical design

Research design

Quasi-experimental research design was used in this study with one or two group of pre and post-test.

Study Setting

The study was conducted in Al-Ramad Hospital , Port Said . This hospital is affiliated to Egypt Health Care Hospitals in Port Said . It consists of 3 buildings; the first one is the outpatient clinics building: it consists of 3 floors with 14 ophthalamogic clinics (3 in the first floor, 7 in the second one, and 4 in the third floor). There is only clinic for retinopathy. These clinics receive about 300 – 500 patients/day.

The second building is a managerial building with 2 floors, but the third building is the main building. It consists of 2 floors; the first floor involves the Emergency department, 2 internal departments (male & female), the manager's office, and the pharmacy. The second floor includes the operation rooms, the internal females department, and the head-nurse's office. the hospital has 24 beds (10 for male & 14 for female).The nurse : patient ratio is 1:5. The hospital has 14 outpatient clinics with one clinic for retinopathy.

Study Subjects

The sample size was calculated using g power software with power 0.95 and significant level 0.01 participant 67 and effect size 0.408 (Faul et al., 2007). With purposive sample were included. and they were willing to participate of the study.

Total sample size = (64) + 5% error (3) = 67 participants .

Inclusion Criteria

1. Both sexes who were attending outpatient diabetic clinic.
2. All patients agreed to participate in this study.

Exclusion Criteria

1. Adult diabetic patients with diabetic retinopathy
2. Mentally challenged patients who were not able to give informed consent.

Tools of data collection

Tool I: Questionnaire sheet : It was adopted from Khalaf et al., (2019), Abd elmouty and Mohammed (2022). Consisted of 6 parts:

Part (1): Socio-demographic characteristics: such as age, gender, marital status, place of residence, level of education, occupation, financial income, financial support, residential state, family type, smoking, using oral contraceptive pills and type of favorite food.

Part (2): Medical history: such as duration of diabetes, the effect of diabetes on daily life activity, having diabetic coma or a drop in blood sugar, hyperglycemia , suffer from hypertension and its duration, eye allergy, history of disease as (heart disease, atherosclerosis, visual problems, feet sores, numbness of feet, weight loss, infection and chest pain).

Part (3): Surgical history: Involved 3 questions about exposure to accident, previous eye surgery, complications after eye surgery.

Part (4): Therapeutic history: Involved using which treatment for diabetes and using eye drops under medical supervision .

Part (5): Family history: Involved does relatives suffer from Diabetes Mellitus, Hypertension, Diabetic retinopathy, Glaucoma in the eye, Cataract in the eye, Retinal detachment, Retinal adhesions and Macular degeneration .

Part (6): Knowledge about diabetic retinopathy: It included 14 questions about what the respondent knew about diabetic retinopathy, including whether or not diabetes can cause eye disease, what areas of the eye can be affected by diabetes mellitus, definition, what areas of the eye should be checked for changes brought on by the condition, signs and symptoms, risk factors, diagnosis, prevention, treatment, complications, and where to find information about the condition.

Scoring system "for part (6)"

One point was given for correct answers, zero was given for wrong answers and the total score percentage was calculated as a percentage of the total knowledge score. For the cut off, the knowledge level was divided three categories : fair level (scores between 50% and less than 65% of the total score), high level (scores 65% or more of the whole score), and low level (less than 50% of the total score).

Tool II: Attitude regarding Diabetic Retinopathy: It was adapted from Mohammed (2022), Abd Elmouty, and Khalaf et al. (2019). The study included of nineteen statements that expressed different perspectives on diabetic retinopathy. These included inquiries about patients' views towards the condition. It is important for people with diabetes to have regular eye exams even if they do not have any vision

issues. Diabetes patients also require regular follow-up. Type 2 diabetes can be avoided from developing diabetic retinopathy if it is not adequately managed . People with type 2 diabetes rarely lose their sight. Patients with diabetes should avoid engaging in physically demanding activities. Finally, a patient's good vision is not always a sign of diabetic retinopathy.

Scoring system

The scoring system of this tool was going as follow using Likert scale as three point-scale consisted of positive and negative items , Scoring for the attitude scale is giving a score of two for agrees, one for ascertain and zero for disagree for positive attitude while for the negative attitude points, scored of two for disagree, one for ascertain and zero for agree .

For the attitude score of patients about diabetic retinopathy: negative < 60% while positive ≥ 65%.

Tool III: Reported practice: It was adopted from Khalaf et al., (2019) , Abd elmouty and Mohammed (2022) consisted of 11 questions about eye care practices reported by the patients such as Frequent measurements of blood pressure, blood sugar, medical examination, administration of diabetic medicine as directed, fundus examination of the eyes on a regular basis, frequency of dilated eye exams, and fluorescence imaging.

Scoring system

One point was given for correct practices , zero was given for wrong practices and the total score percentage was calculated as a percentage of the total practices score. For the cut off , the practice was considered to be satisfactory (scores 60% or more of the total score) or unsatisfactory (scores less than 60% of the total score).

B. Operational design

Tool's validity:

The knowledge questionnaire sheet was validated by three experts from the departments of Community Health Nursing, Internal medicine, and Public Medicine

at Assiut University. They assessed the instruments for clarity, relevance, comprehensiveness, and applicability , Khalaf et al., (2019).

Content validity of attitude and reported practice tools were tested by a jury of five experts in the field of community health nursing at Mansoura University and the required modifications were carried out , Abd elmouty and Mohammed (2022).

Tool's reliability:

The internal consistency of the knowledge questionnaire was assessed using the Cronbach's alpha test, yielding an overall Cronbach's alpha of 0.82, indicating very good reliability. The reliability statistics for the main domains ranged from acceptable (>0.5) to very good (0.8–0.9), as defined by Bowling (2002) and Khalaf et al. (2019).

The tools of attitude and reported practice were assessed by Cronbach's α to assess the internal consistency of the tools, which was 0.92 for "Attitude of diabetic patients" ,and 0.90 for the tool of reported practice , Abd elmouty and Mohammed (2022).

Pilot study

Pilot study was conducted on 7 diabetic patients (10% of the sample size) chosen randomly and these patients were omitted from the study population to evaluate the clarity, applicability of the study tools, and to estimate the approximate time required for data collection , the subjects of the pilot study were included in the study's overall sample and were completed over the course of two month from the beginning of February 2022 to the end of March 2022 .

Field of work

The study was implemented to fulfill the research aim through the following four phases: assessment, planning , implementation, and evaluation **.** The whole study covered a period of one year from 1 st of January 2022 until the end of December 2022 (one month for obtaining the official permission, two month for the pilot study

collection, about three months for implementation of the sessions and the last six months consume of data entry and statistical analysis.

Phase (1): Assessment

Patients gave their verbal agreement to participate in the study prior to its execution, using the data collection forms as a pre-test to compare baseline data with post-test results. In order to create an educational intervention and reinforce it with a vibrant booklet, it also assists the researcher in determining the participants' educational needs. It was written in straightforward Arabic. The medical outpatient clinic's administrative authority located a location for the instructional session. Usually, it's a meeting area with a large table and seats surrounded by a peaceful, well-ventilated space. This phase entailed gathering pre-program data for baseline assessment. The researcher met the diabetic patients and fill out the questionnaire to evaluate their awareness, attitude and practice toward diabetic retinopathy and covered the following: definition of diabetic retinopathy, causes, classifications, manifestation, stages, and risk factors as well as preventive measures. The questionnaire took about 15-30 minutes to be filled. The data obtained during this phase was considered the basis for designing of educational sessions.

Phase (2): Planning

Based on the information obtained from initial assessment, in addition to recent literature, the researcher designed the educational sessions. Its main aim was to explore the effect of retinopathy prevention educational sessions on knowledge, attitude and practice of adult diabetic patients in Al-Ramad Hospital, Port Said.

A Colored brochures and a booklet were developed for patients prior to initiate the health educational sessions, which covered all items related to diabetic retinopathy and its prevention. The educational booklet was written in a simple Arabic language with different illustrated colored pictures to enhance the learning process and facilitate patient’s understanding.

Phase (3): Implementation

The educational sessions were carried out in Al-Ramad Hospital. Port Said affiliated to the Egypt Health Care Authority. The researcher attended to the clinic specialized for retinopathy from 9 am to 1 pm to collect the data and apply the educational intervention. The educational sessions were conducted in small groups (10 groups) of 5 - 6 patients.

The educational sessions was conducted through one session ; each group obtained the session about 60 - 90 minutes.

The session's objective was outlined in the introductory section, detailing the study phases and program sessions, including the timing, duration, location, and content. Information was also provided about diabetic retinopathy and its prevalence in Egypt. Additionally, knowledge about retinopathy, including its definition, causes, types, symptoms, and predisposing factors, was discussed, then we had a break about 10 minutes after that we completed the session about preventive measures of diabetes mellitus such as control of blood sugar and blood pressure , good nutrition with suitable level of cholesterol in the body , weight loss , mild exercise , avoid stress and excessive efforts and stop smoking , subsequently the general guidelines for retinopathy prevention, including the significance of monitoring and screening techniques such routine ocular fundus examinations and blood glucose testing on a regular basis.

A variety of teaching and learning strategies were used during the sessions, such as interactive lectures, group discussions, and the use of instructional media like photos and printed handouts. The educational content was delivered in a clear and succinct manner to serve as a reference. Simple language appropriate for the patients' comprehension level was used, while incorporating motivation and reinforcement techniques. An additional 10 minutes were provided after the session to address further questions.

Direct reinforcement in the form of a copy from the educational booklet was given during and after the sessions as a reward for each patient to use as a future reference. patients were allowed to ask for any interpretation, elaboration, or explanation of any item included in the sessions. The duration of session implementation was about four months from the first of April till the end of july 2022.

Phase (4): Evaluation

After the implementation of the educational intervention, an additional 10 Minutes was offered for answering more questions. A post-test was done immediately to assess the effect of a health education intervention on the diabetic retinopathy prevention. The post-test was done immediately by the end of the session of health education intervention by using the same tools used in the pretest.

C. **Administrative design**

Before initiating any steps in the study, an official letter from the Dean of the Faculty of Nursing at Port Said University was sent to the Director of Al-Ramad Hospital in Port Said, requesting permission and cooperation to conduct the research, along with an explanation of its aim. Consent to participate in the study was obtained from both the supervisors at Al-Ramad Hospital and the adult diabetic patients, after explaining the purpose of the study to each of them.

Ethical considerations

Approval was taken from the Scientific Research Ethical Committee in the Faculty of Nursing , Port Said University Code number NUR(3/7/2022)(15) .An informed consent was obtained from patients to participate in the study after explaining the purpose of the study. The studied patients were informed that their participation is voluntary and they have the right to withdraw from study at any time. Ensuring the confidentiality of the information collected and anonymity is guaranteed.

D. Statistical design

The collected data was organized, categorized, tabulated, entered, and analyzed by using SPSS, (statistical Package for Social Sciences), soft – ware program version 21, which will be applied to frequency tables.

The Following Statistical Measures was used:

1. Descriptive measures included: count, percentage, and arithmetic mean, standard deviation, minimum and maximum.
2. Statistical tests include: McNemar Chi square, Friedman ANOVA, and spearman correlation.
3. The level of significance selected for this study was $p \leq 0.05$.

RESULTS

Table (1): shows socio-demographic characteristics of studied patients indicated that, 47.8% of the studied patients were in age group 50: 60 years old and 58.2% of them were female, 55.2% of them were an employee. Moreover, 43.3% of studied patients had University education and 77.6% of them were married. Concerning financial income, 77.6% of studied patients were mentioned their income not enough, and 67.2% of them were lived in urban area, while 88.1% of them lives with their families, and 55.2% had nuclear family.

Otherwise, 85.1% weren't smoking, and 76.9% of studied female patients were use oral contraceptive pills. Regarding favorite type of food 68.6% were prefer meat.

Table (2): reveals distribution of the studied patients according to medical history. As evident in the table, 37.7% of the studied patients had diabetes since more than 5 years, and 49.3% of them diabetes effects on their daily activities, 74.6% have experienced a diabetic coma from hypoglycemia, 80.6% of them have experienced a diabetic coma from hyperglycemia.

Furthermore, 62.7% of the studied patients suffering from hypertension and 47.6 % of them suffering from hypertension since more than 5 years. Concerning eye allergy, 74.6% of the studied patients weren't suffer from eye allergy. Moreover, 53.7% of them suffering from visual problems .

Table (3): clarifies the studied patients' knowledge pre- and post-sessions. there was significant improvement difference between pre- and post- sessions scores related to diabetes can cause eye disease (p=0.011) . Regarding parts of the eye affected by diabetes mellitus, there was significant improvement differences related to

items of cornea and vessels (p= 0.008, p, 0.009). As well as, there was significant improvement difference regarding sever non-poliferative diabetic retinopathy (p= 0.002). Also, there was significant improvement differences regarding very sever poliferative diabetic retinopathy (p= 0.012) .

Concerning most susceptible people to diabetic retinopathy, there was significant improvement differences between pre- and post- sessions regarding items of diabetic patients, patients with hyperlipidemia, the elderly (p= 0.001, p= 0.039, p=0.026) respectively. Regarding parts of the eye should be examined for changes due to diabetic retinopathy , there was significant improvement differences between pre- and post- sessions scores related to items of vessels, iris, pupil (p= 0.011, p= 0.018, p= 0.011) respectively.

Also illustrates that, there was marked improvement in the studied patients' level of knowledge post-sessions. As presented, that there were significant improvement differences between pre- and post- sessions scores regarding symptoms of diabetic retinopathy in all items except items related to blurred vision, Change the color of the conjunctiva of the eye ,difficulty in perception of image, and burning sensation in the eyes (p= 0.109, p= 0.071 , p= 0.058, p=0.093) respectively.

Regarding signs of the diabetic retinopathy, there was significant improvement differences between pre- and post- sessions results in all items. As evidence, more than half of them had good knowledge pre- sessions regarding fat accumulation on the retina (52.2%) and eating nerve tissues (32.8%) which improved post- sessions to (76.1%, 71.6%) respectively.

Regarding Risk factors of the diabetic retinopathy, there was significant improvement differences between pre- and post- sessions results in all items except items related to duration of diabetes , poor glucose control , high cholesterol and getting old (p=0.412 , P= 0.095 , P= 0.063 , P= 0.059) respectively .

Also, elaborates there was significant improvement post- sessions in the studied patients' knowledge regarding complication, diagnosis, and methods of

prevention of diabetes retinopathy compared to pre- sessions scores. As presented, they answered about complication of diabetes retinopathy pre-program as (bleeding 52.2%, retinal detachment 58.2%, blindness 41.8%) which improved post- sessions to (73.1%, 85.1%, 98.5%) respectively. Regarding diagnosis of diabetic retinopathy, there was significant improvement difference in all items except in eye funds examination (p=0.067) , and the highest percentage of the studied patients (65.7%) were answered correctly about eye funds examination pre- sessions which increased post- sessions to (89.6%).

Concerning methods of prevention, 26.9% and 38.8% of the studied patients were answered correctly pre- sessions regarding regular follow up of the pregnant woman with doctor and not smoking which improved post- sessions to (58.2%, 73.1% respectively) with significant improvement differences in all items related to methods of prevention of diabetic retinopathy except items of regular control of blood sugar, exercise, maintaining a balanced diet, periodic follow up every 3-4 months of the eye, and commitment to diabetes treatment (p=0.823, p=0.563, p=0.062, p=0.067, p=0.652) respectively. Regarding treatment of diabetic retinopathy post- sessions compared to pre- sessions scores. As evidence, 65.7% of the studied patients were answered correctly pre- sessions regarding laser treatment which improved to (92.5%) post-sessions with no significant difference in items of laser treatment and Vitrous excision (p=0.181 , p=0.062) respectively.

Finally, related to the studied patients' source of information about diabetic retinopathy, there was significant improvement difference in all items except item of doctor (p=0.113) respectively.

Table (4): the attitude of the studied patients was statistically significantly improved in the post-test compared to pre-test scores in all tested items except items of Diabetic patient needs follow up with an internist, not an ophthalmologist , Poor vision is definitely due to diabetes , Timely treatment can prevent/ delay damage in eyes due to diabetes , Diabetic patient should not participate in violent physical activities , Regular control of blood sugar is important , Smoking can increase the risk of diabetic retinopathy , Diabetic retinopathy is completely cured , Mass media play important role in raise awareness of the community (p=0.059 , p=0.057 , p=0.325 , p=0.246 , p=0.062 , p=0.305 , p=0.236 , p=0.075) respectively . As evidence, post-

test (94%, 92.6%, 89.6% respectively) of the studied patients had positive attitude related to regular control of blood sugar is important, timely treatment can prevent/ delay damage in eyes due to diabetes, persons with diabetes go for regular eye examinations.

Table (5): there was a significant improvement in the studied patients' practices regarding Diabetic Retinopathy post-test than pre-test in all tested items except items of walking and running exercise (p=0.091 , p=0.129), items of visiting an internist once or twice a year to follow up on diabetes (p=0.051, p=0.062), Also except items of consulting any specialist or general practitioner in case of eye problem (p=0.127 , p=0.235) respectively. As evidence, the highest percentages of studied patients (92.5%, 88.1%, 82.1% respectively) had satisfactory practices related to take diabetic medication regular, follow up on diabetes, and consult in case of eye problem respectively.

Table (6): shows that there was no statistically significant relation between attitude regarding Diabetic Retinopathy with medical and family history of the studied patients , But there was statistically significant relation between patients' knowledge and their medical history of feet sores, Numbness of feet, and weight loss (p= 0.001, p= 0.004, p= 0.001) pre-test , also in relation between patients' knowledge and their family history of diabetes (p=0.002). And there was statistically significant relation between the studied patients' practice regarding Diabetic Retinopathy with their medical history of visual problems (p= 0.025) post-test.

Figure (1): presents total scores of the studied patients' knowledge, attitude , and practice regarding Diabetic Retinopathy pre and post sessions. There was significant improvement post- sessions in the studied patients' knowledge compared with pre- sessions results (p= 0.006). The figure illustrates that nearly one fifth (19.4%) of the studied patients had good knowledge pre- sessions which improved to (56.7%) of them had good knowledge post sessions.

Furthermore, there was significant improvement post- sessions in the studied patients' attitude compared with pre- sessions scores (p= 0.008). The figure clarifies that more than two fifth (44.8%) of them had positive attitude which improved to the most of them (83.6%) had positive attitude post- sessions. Regarding practice, there

was significant improvement post- sessions in the studied patients' practice compared with pre- sessions results (p= 0.009). As evidence, less than half (41.8%) of the studied patients had satisfactory practice pre- sessions which improved to the most of them (82.1%) had satisfactory practice post-sessions.

Table (1): Distribution of the studied sample according to socio-demographic characteristics: (N=67).

Item	Patients (N=67)	
	N	%
Age in Years		
20: ≤	1	1.5
30: ≤	7	10.4
40: ≤	27	40.3
50: 60	32	47.8
Gender		
Male	28	41.8
Female	39	58.2
Occupation		
Worker	13	19.4
Employee	37	55.2
Housewife	9	13.4
Businessman	4	6.0
Others	4	6.0
Level of education		
Illiterate	2	3.0
Primary education	4	6.0
Preparatory education	6	9.0
Secondary education	25	37.3
University – College	29	43.3
Post graduate	1	1.4
Marital status		
Single	9	13.4
Married	52	77.6
Widowed	3	4.5
Divorced	3	4.5
Financial income		
Sufficient	15	22.4
Insufficient	52	77.6
Residence		
Rural	22	32.8
Urban	45	67.2
Resident state		
Lives alone	8	11.9
Lives with family	59	88.1

Item	**Patients (N=67)**	
	N	**%**
Family type		
Nuclear	37	55.2
Extended	30	44.8
Smoke		
Yes	10	14.9
No	57	85.1
Use oral contraceptive pills (n=39)		
Yes	30	76.9
No	9	23.1
Favorite type of food		
Vegetarian	21	31.4
Meat	46	68.6

Table (2): Distribution of the studied patients according to patients' medical history (N=67).

Items	Patients (N=67)	
	N	%
Patients' Medical history **Duration of diabetes**		
Less than one year	9	13.4
1 year ---	15	22.4
3 years ---	18	26.9
More than 5 years	25	37.3
Diabetes effect on daily activity		
Yes	33	49.3
No	24	35.8
Some times	10	14.9
Exposure to a diabetic coma from hypoglycemia		
Yes	17	25.4
No	50	74.6
Experience a diabetic coma from hyperglycemia		
Yes	54	80.6
No	13	19.4
Suffer from high blood pressure		
Yes	42	62.7
No	25	37.3
Duration of high blood pressure (n =42)		
One year	2	4.8
2 years	4	9.5
3 years	6	14.3
5 years	10	23.8
More than 5 years	20	47.6
Suffer from eye allergy		
Yes	17	25.4
No	50	74.6
***History of signs and disease**		
Feet sores	23	34.3
Numbness of feet	27	40.3
Weight loss	29	43.3
Infection	26	38.8
Chest pain	21	31.3
Visual problems	36	53.7
Heart disease	20	29.9
Atherosclerosis	9	13.4

*Multiple Answers

Table (3): Distribution of the studied sample according to Knowledge about diabetic retinopathy (N=67).

Items	Pre-test				Post-test				χ^2	(p) Value
	Yes		No		Yes		No			
	N	%	N	%	N	%	N	%		
Diabetes can cause eye disease	32	47.8	35	52.2	57	85.1	10	14.9	5.612	0.011*
***Parts of the eye affected by diabetes mellitus**										
Retina	40	59.7	27	40.3	62	92.5	5	7.5	3.801	0.092
Optic nerve	49	73.1	18	26.9	58	86.6	9	13.4	1.023	0.126
Cornea	45	67.2	22	32.8	22	32.8	45	67.2	7.72	0.008*
Vessels	30	44.8	37	55.2	55	82.1	12	17.9	6.925	0.009*
Lens	24	35.8	43	64.2	25	37.3	42	62.7	0.372	0.763
Iris	22	32.8	45	67.2	20	29.9	47	70.1	0.567	0.439
Pupil	24	35.8	43	64.2	18	26.9	49	73.1	0.982	0.247
Definition of diabetic retinopathy										
A problem caused by diabetes and leads to blindness	47	70.1	20	29.9	60	89.6	7	10.4	2.932	0.099
Types of the diabetic retinopathy										
Non poliferative diabetic retinopathy										
Mild	32	47.8	35	52.2	40	59.7	27	40.3	1.561	0.117
Moderate	42	62.7	25	37.3	50	74.6	17	25.4	1.682	0.108
Severe	36	52.8	31	46.2	56	83.6	11	16.4	10.931	0.002*
Poliferative diabetic retinopathy										
Very severe	45	67.2	22	32.8	62	92.5	5	7.5	5.268	0.012*
***Most susceptible people to diabetic retinopathy**										
Diabetic patients	44	65.7	23	34.3	65	97.9	2	2.1	11.338	0.001*
Hypertensive patients	49	73.1	18	26.9	56	83.6	20	16.4	1.915	0.189
Pregnant woman	38	56.7	29	43.3	42	62.7	25	37.3	1.323	0.209
Patients with hyperlipidemia	32	47.8	35	52.2	49	73.1	18	26.9	4.225	0.039*
Smokers	51	76.1	16	23.9	59	88.1	8	11.9	3.009	0.079
The elderly	55	82.1	12	17.9	67	100	0	0	4.425	0.026*

***Parts of the eye should be examined for changes due to diabetic retinopathy**										
Retina	40	59.7	27	40.3	62	92.5	5	7.5	3.491	0.063
Optic nerve	49	73.1	18	26.9	56	83.6	21	16.4	2. 421	0.102
Cornea	45	67.2	22	32.8	55	82.1	22	17.9	3.698	0.064
Vessels	30	44.8	37	55.2	59	88.1	8	11.9	6.789	0.011*
Lens	24	35.8	43	64.2	35	52.2	32	47.8	3.601	0.069
Iris	22	32.8	45	67.2	36	53.7	31	46.3	6.677	0.018*
Pupil	24	35.8	43	64.2	33	49.3	34	50.7	8.257	0.011*
***Symptoms of diabetic retinopathy**										
Blurred vision	41	61.2	33	49.3	49	77.6	15	22.4	1.746	0.109
Double vision	35	52.2	37	55.2	52	73.1	18	26.9	7.818	0.006*
Black dots/lines	37	55.2	38	56.7	49	83.6	11	16.4	5.983	0.011*
Change the color of the conjunctiva of the eye	34	50.7	32	47.8	56	73.1	18	26.9	3.709	0.071
A vision of a dark imagination	30	44.8	45	67.2	48	77.6	15	22.4	6.002	0.014*
Fluctuation of vision dark or empty spaces in the visual field	29	43.3	30	44.8	47	73.1	18	26.9	7.125	0.009*
Difficulty in perception of image	35	52.2	28	41.8	51	83.6	11	16.4	4.621	0.058
Eye pain	22	32.8	28	41.8	51	71.6	19	28.4	11.757	0.001*
Burning sensation in the eyes	37	55.2	33	49.3	47	70.1	20	29.9	2.875	0.093
Eye inflammations	39	58.2	37	55.2	56	76.1	16	23.9	10.676	0.002*
***Signs of the diabetic retinopathy**										
Bloody spills in the eye	34	50.7	32	47.8	51	70.1	20	29.9	4.782	0.041*
Widening and tortuosity of the retinal capillaries	30	44.8	45	67.2	48	83.6	11	16.4	5.112	0.03*
Retinal hypertrophy	29	43.3	45	67.2	48	53.7	31	46.3	10.005	0.002*
Fat accumulation on the retina	35	52.2	23	34.3	61	76.1	16	23.9	13.621	0.001*
Eating nerve tissues	22	32.8	37	55.2	59	71.6	19	28.4	14.03	0.001*

***Risk factors of diabetic retinopathy**										
Duration of diabetes	44	65.7	34	50.7	47	91.1	6	8.9	0.676	0.412
Poor glucose control	30	44.8	48	71.6	37	88.1	8	11.9	2.612	0.095
Hypertension	28	41.8	43	64.2	39	85.1	10	14.9	4.872	0.043*
Pregnancy	33	49.3	23	34.3	66	70.1	20	29.9	11.854	0.001*
Obesity	19	28.4	41	61.2	44	55.2	30	44.8	5.642	0.032*
High cholesterol	24	35.8	49	73.1	36	58.2	28	41.8	3.582	0.063
Getting old	44	65.7	49	73.1	36	98.5	1	1.5	3.861	0.059
Smoking	26	38.8	32	47.8	49	65.7	23	34.3	8.965	0.004*
Race (black more than white)	18	26.9	28	41.8	57	53.7	31	46.3	12.629	0.001*
***Complication of diabetic retinopathy**										
Bleeding	35	52.2	39	58.2	66	73.1	18	26.9	9.731	0.003*
Retinal detachment	39	58.2	28	41.8	59	85.1	10	14.9	5.284	0.029*
Blindness	28	41.8	23	34.3	60	98.5	1	1.5	11.953	0.001*
***Diagnosis of diabetic retinopathy**										
Vision test	39	58.2	29	43.3	51	88.1	8	11.9	4.799	0.043*
Eye funds examination	44	65.7	29	43.3	51	89.6	7	10.4	3.214	0.067
Tonometry	33	49.3	32	47.8	59	73.1	18	26.9	7.945	0.008*
Drawing blood vessels in the eye with dye	38	56.7	20	29.9	57	76.1	16	23.9	6.349	0.012*

***Methods of prevention of diabetic retinopathy**										
Regular eye examination every 12 months at least	35	52.2	23	34.3	66	88.1	8	11.9	8.421	0.004*
Regular control of blood sugar	47	70.1	39	58.2	49	85.1	10	14.9	0.931	0.823
Controlling the level of fats in the blood	19	28.4	49	73.1	39	53.7	31	46.3	6.831	0.013*
Exercise	44	65.7	41	61.2	49	98.5	1	1.5	1.231	0.563
Controlling blood pressure and preventing its rise	28	41.8	23	34.3	56	73.1	18	26.9	10.921	0.002*
Regular follow up of the pregnant woman with doctor	18	26.9	20	29.9	58	58.2	28	41.8	12.917	0.001*
Not smoking	26	38.8	32	47.8	57	73.1	18	26.9	11.643	0.001*
Maintaining a balanced diet	44	65.7	17	25.4	59	83.6	11	16.4	3.872	0.062
Periodic follow up every 3 – 4 months of the eye	47	70.1	17	25.4	59	86.7	9	13.3	3.121	0.067
Go to the doctor when facing any problem or change in the condition of the eye	35	52.2	23	34.3	62	85.1	10	14.9	7.639	0.006*
Commitment to diabetes treatment	50	74.6	28	41.8	47	88.1	8	11.9	1.023	0.652
***Treatment for diabetic retinopathy**										
Laser treatment	44	65.7	41	61.2	39	92.5	5	7.5	1.921	0.181
Vitrous excision	39	58.2	43	64.2	24	70.1	20	29.9	3.998	0.062
Phototherapy	26	38.8	59	88.1	8	58.2	28	41.8	5.092	0.009*
***Your source of information about diabetic retinopathy**										
Doctor	24	35.8	35	52.2	32	35.8	43	64.2	2.309	0.113
Relatives	8	11.9	0	0	67	11.9	59	88.1	13.762	0.001*
Books	31	46.3	0	0	67	46.3	36	53.7	10.762	0.002*
Mass media	32	47.8	0	0	67	47.8	35	52.2	10.541	0.002*

*Significant (P<0.05). χ^2 chi-square tests. *Multiple Answers

Table (4): Distribution of the studied sample according to Attitude regarding Diabetic Retinopathy (N=67).

Items	Pre-test				Post-test				χ^2	(p) Value
	Agree		Disagree		Agree		Disagree			
	N	%	N	%	N	%	N	%		
Type 2 diabetes rarely loses vision	39	58.2	28	41.8	56	83.6	11	16.4	6.721	0.008*
Persons with diabetes go for regular eye examinations	44	65.7	23	34.3	60	89.6	7	10.4	4.963	0.042*
Diabetic patient needs follow up with an internist , not an ophthalmologist	46	68.7	21	31.3	59	88.1	8	11.9	3.901	0.059
No need to visit ophthalmologist if a person having diabetes under control	41	61.2	26	38.8	56	83.6	11	16.4	4.748	0.044*
Poor vision is definitely due to diabetes	28	41.8	39	58.2	40	59.7	27	40.3	3.951	0.057
Timely treatment can prevent/ delay damage in eyes due to diabetes	55	82.1	12	17.9	62	92.6	5	7.4	1.368	0.325
Diabetic patient should not participate in violent physical activities	47	70.1	20	29.9	52	77.6	15	22.4	1.107	0.246
Diabetes can be controlled without regular medication	24	35.8	43	64.2	36	53.7	40	46.3	4.921	0.044*
Good vision definitely doesn’t mean diabetic retinopathy	27	40.3	40	59.7	38	56.7	29	43.3	4.654	0.048*
Diabetes causes retinopathy	33	49.3	34	50.7	56	83.6	20	16.4	8.406	0.004*

Duration of DM is related to eye disease	22	32.8	45	67.2	49	73.1	18	26.9	11.432	0.001*
Dietary control & life style modifications are important	38	56.7	29	43.3	58	86.6	9	13.4	7.942	0.006*
Patients with diabetic retinopathy should not take aspirin	22	32.8	45	67.2	39	58.2	28	41.8	4.589	0.047*
Diabetic retinopathy can cause irreversible blindness	37	55.2	30	44.8	59	88.1	8	11.9	8.951	0.004*
Early diagnosis of diabetic retinopathy is important	33	49.3	34	50.7	55	82.1	12	17.9	9.05	0.002*
Regular control of blood sugar is important	47	70.1	20	29.9	63	94.0	4	6.0	3.952	0.062
Smoking can increase the risk of diabetic retinopathy	39	58.2	28	41.8	46	68.7	21	31.3	1.093	0.305
Diabetic retinopathy is completely cured	10	14.9	57	85.1	20	29.9	47	70.1	1.982	0.236
Mass media play important role in raise awareness of the community	26	38.8	41	61.2	40	59.7	27	40.3	3.274	0.075

***Significant (P<0.05).** χ^2 chi-square tests**.**

Table (5): Distribution of the studied patients' according to reported practice regarding Diabetic Retinopathy (N= 67).

Items	Pre-test				Post-test				χ^2	(p) Value
	Yes		**No**		**Yes**		**No**			
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**		
***Exercise activities**										
Walking	39	58.2	28	41.8	49	73.1	18	26.9	2.952	0.091
Running	6	9.0	61	91.0	12	17.9	55	82	1.842	0.129
Swimming	7	10.4	60	89.6	27	40.3	40	59.7	5.923	0.012*
***Type of diet you follow**										
Normal diet	19	28.4	48	71.6	5	7.5	62	92.5	4.823	0.047*
Diabetic diet	35	52.2	32	47.8	55	82.1	12	17.9	7.831	0.008*
Hypertensive diet	28	41.8	39	58.2	49	73.1	18	26.9	6.924	0.009*
***Visit an internist to follow up on diabetes**										
Once a year	29	43.2	38	56.8	13	19.4	54	80.6	4.023	0.051
twice a year	26	38.8	41	61.2	35	52.2	32	47.8	3.811	0.062
more	35	52.2	32	47.8	59	88.1	8	11.9	6.534	0.011*
***Consult in case of eye problem**										
Ophthalmologist	38	56.7	29	43.3	55	82.1	12	17.9	5.651	0.023*
Any specialist (non-ophthalmologist)	18	26.9	49	73.1	9	13.4	58	86.6	2.391	0.127
General practitioner	11	16.4	56	83.6	5	7.5	62	92.5	1.921	0.235
Control blood pressure and prevent its rise (n=42)	20	47.6	22	52.4	38	90.5	4	9.5	8.762	0.001*
Control the level of sugar in the blood	34	50.7	33	49.3	58	86.6	9	13.4	6.711	0.012*
***Do blood sugar checks**										
Random	30	44.8	37	55.2	56	83.6	11	16.4	6.931	0.011*
Fasting	38	56.7	29	43.3	54	80.6	13	19.4	4.658	0.046*
2 hrs. after eating	20	29.9	47	70.1	54	80.6	13	19.4	8.921	0.007*
Take diabetic medication regular	38	56.7	29	43.3	62	92.5	5	7.5	11.021	0.001*
Do periodic examination of the eye at least every 12 months	36	53.7	30	46.3	52	77.6	15	22.4	5.743	0.011*
Measure eye tension	18	26.9	49	73.1	50	74.6	17	25.4	13.921	0.001*
Do an angiogram of the eye with dye	22	32.8	45	67.2	49	73.1	18	26.9	7.832	0.009*

*Significant (P<0.05). χ^2 chi-square tests. *Multiple Answers

Table (6): Distribution of the study sample related to relation between Knowledge, attitude and practice with the Medical and Family history of the Studied patients (N=67).

Variables	Knowledge	t (p)	Practice	t (p)	Attitude	t (p)
Medical history of diabetes						
Yes	66.7±6.6	10.364 (0.002*)	7.5±1.3	0.410 (0.524)	16.8±2.1	2.532 (0.116)
No	71.6±5.5		7.7±1.1		17.7±2.4	
Family history of diabetic retinopathy						
Yes	70.1±6.1	0.051 (0.823)	7.7±1.3	0.691 (0.409)	17.6±2.3	0.543 (0.464)
No	69.6±6.7		7.5±1.1		17.2±2.4	
Medical history of Hypertension						
Yes	69.1±6.6	0.236 (0.629)	7.7±1.3	0.021 (0.886)	17.7±1.9	0.351 (0.556)
No	70.1±6.3		7.6±1.2		17.3±2.4	
Medical history of Heart disease						
Yes	70.9±6.5	0.805 (0.373)	7.7±1.1	0.015 (0.904)	17.8±2.3	0.806 (0.373)
No	69.4±6.3		7.6±1.3		17.2±2.3	
Medical history of Atherosclerosis						
Yes	66.8±7.8	2.352 (0.130)	8.1±0.7	1.321 (0.255)	17.7±2.1	0.196 (0.659)
No	70.3±6.1		7.6±1.2		17.4±2.4	
Medical history of Visual problems						
Yes	70.2±6.2	0.187 (0.666)	7.3±1.2	5.229 (0.025*)	17.2±2.5	0.690 (0.409)
No	69.5±6.5		8.1±1.1		17.7±2.1	
Medical history of Feet sores						
Yes	66.5±6.1	11.31 (0.001*)	7.7±1.1	0.103 (0.749)	17.3±2.1	0.019 (0.890)
No	71.6±5.8		7.6±1.3		17.5±2.6	
Medical history of Numbness of feet						
Yes	67.2±6.9	9.141 (0.004*)	8.0±0.87	3.305 (0.074)	17.2±2.1	0.400 (0.530)
No	71.7±5.2		7.4±1.3		17.6±2.6	
Medical history of Weight loss						
Yes	66.6±6.5	17.094 (0.001*)	7.6±1.1	0.011 (0.918)	17.1±2.1	0.858 (0.358)
No	72.3±4.9		7.7±1.4		17.7±2.6	
Medical history of Infection						
Yes	70.0±6.0	0.015 (0.904)	7.4±1.4	1.233 (0.271)	17.5±2.5	0.060 (0.807)
No	69.8±6.6		7.8±1.1		17.4±2.3	
Medical history of Chest pain						
Yes	68.3±6.5	1.836 (0.180)	7.6±1.4	0.055 (0.816)	17.8±2.5	0.897 (0.347)
No	70.5±6.2		7.7±1.1		17.3±2.3	

*Significant (P<0.05). (t) t- tests.

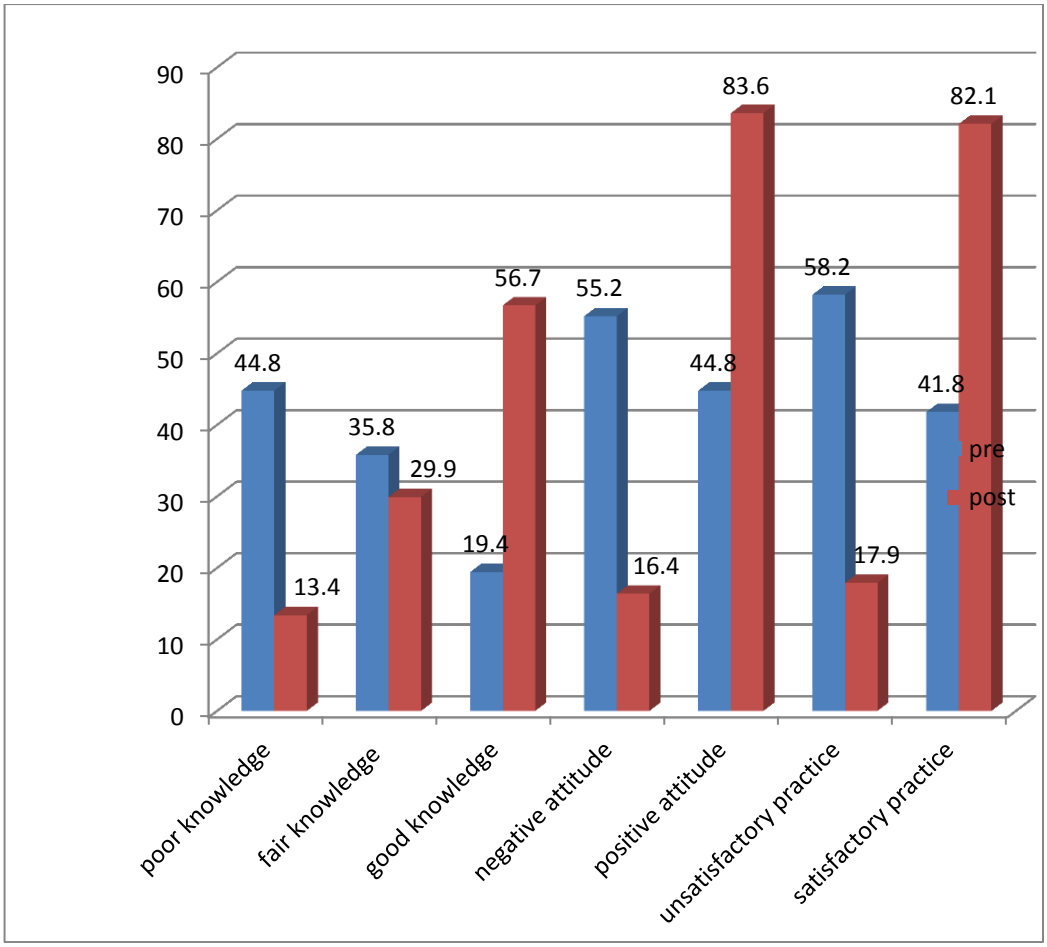

Figure (1): Total scores of The studied patients' knowledge , attitude , and practice regarding Diabetic Retinopathy

DISCUSSION

The present study revealed that most of the patients had poor knowledge with significant improvement difference between pre- and post- sessions scores related to diabetes can cause eye disease (p=0.011) . Regarding parts of the eye affected by diabetes mellitus, there was significant improvement differences related to items of cornea and vessels (p= 0.008, p, 0.009). As well as, there was significant improvement difference regarding sever non-poliferative diabetic retinopathy (p= 0.002). Also, there was significant improvement differences regarding very sever poliferative diabetic retinopathy (p= 0.012).

Concerning most susceptible people to diabetic retinopathy, there was significant improvement differences between pre- and post- sessions regarding items of diabetic patients, patients with hyperlipidemia, the elderly (p= 0.001, p= 0.039,

p=0.026) respectively. Regarding parts of the eye should be examined for changes due to diabetic retinopathy , there was significant improvement differences between pre- and post- sessions scores related to items of vessels, iris, pupil (p= 0.011, p= 0.018, p= 0.011) respectively.

This finding comes in line with those reported by Khalaf et al. in 2019 as they reported that that before the educational sessions, the patients' broad awareness of the definition, types, and individuals susceptible to DR was insufficient, but that after the sessions, their level of knowledge improved.

Similarly, Abd elmouty S.M and Mohammed H.H in 2022 about Effect of educational sessions about prevention of retinopathy on knowledge, attitude and practice of diabetic patients in medical outpatient clinics of Specialized Medical Hospital - Mansoura University in 2022 performed their study on 120 diabetic patients attending outpatient clinics aiming to evaluate the effect of educational sessions about prevention of retinopathy on knowledge, attitude and practice of diabetic patients. They found that the majority of the diabetic patients had poor knowledge about the disease before health education. Meanwhile, the majority of the patients had good knowledge after the educational sessions.

This improvement could be due to a lack of educational messages about diabetic retinopathy in the medical facilities that the patients visit , therefore, the participant's awareness of diabetic retinopathy was greatly increased by these training sessions.

The current study also revealed marked improvement in the studied patients' level of knowledge post sessions. As presented, that there were significant improvement differences between pre- and post- sessions scores regarding symptoms of diabetic retinopathy in all items except items related to blurred vision, Change the color of the conjunctiva of the eye ,difficulty in perception of image, and burning sensation in the eyes (p= 0.109, p= 0.071 , p= 0.058, p=0.093) respectively.

Regarding signs of the diabetic retinopathy, there was significant improvement differences between pre- and post- sessions results in all items. As evidence, more than half of them had good knowledge pre-program regarding fat accumulation on the retina (52.2%) and eating nerve tissues (32.8%) which improved post- sessions to (76.1%, 71.6%) respectively.

Regarding Risk factors of the diabetic retinopathy, there was significant improvement differences between pre- and post- sessions results in all items except items related to duration of diabetes , poor glucose control , high cholesterol and getting old (p=0.412 , P= 0.095 , P= 0.063 , P= 0.059) respectively .

Such findings are in agreement with Hosseini S.S , Shamsi M , Khorsandi M and Moradzadeh R in 2021 about The effect of educational program based on theory of planned behavior on promoting retinopathy preventive behaviors in patients with type 2 diabetes in 2021 who studied 47 diabetic patients and demonstrated that applying the educational program based on Theory of Planned Behavior model proved to be very effective in developing an educational program for patients with diabetes, to control their blood sugar and enhance preventive behaviors of retinopathy.

Such findings can be attributed to the session's clarity and the simplicity of language, as well as the suitable teaching method and instructional materials that were used .

Regarding statistically significant improvement post- sessions in the studied patients' knowledge regarding complication, diagnosis, and methods of prevention of diabetes retinopathy compared to pre- sessions scores. As presented, they answered about complication of diabetes retinopathy pre-program as (bleeding 52.2%, retinal detachment 58.2%, blindness 41.8%) which improved post- sessions to (73.1%, 85.1%, 98.5%) respectively. Regarding diagnosis of diabetic retinopathy, there was significant improvement difference in all items except in eye funds examination (p=0.067) , and the highest percentage of the studied patients (65.7%) were answered correctly about eye funds examination pre- sessions which increased post- sessions to (89.6%).

Concerning methods of prevention, 26.9% and 38.8% of the studied patients were answered correctly pre- sessions regarding regular follow up of the pregnant woman with doctor and not smoking which improved post- sessions to (58.2%, 73.1% respectively) with significant improvement differences in all items related to methods of prevention of diabetic retinopathy except items of regular control of blood sugar , exercise , maintaining a balanced diet , periodic follow up every 3-4 months of the eye , and commitment to diabetes treatment (p=0.823 , p=0.563 , p=0.062 , p=0.067 , p=0.652) respectively . Regarding treatment of diabetic retinopathy post- sessions compared to pre- sessions scores. As evidence, 65.7% of the studied patients were answered correctly pre- sessions regarding laser treatment which improved to (92.5%) post- sessions with no significant difference in items of laser treatment and Vitrous excision (p=0.181 , p=0.062) respectively .

Finally, related to the studied patients' source of information about diabetic retinopathy , there was significant improvement difference in all items except item of doctor (p=0.113) respectively .

These results are consistent with a study conducted in 2022 by Abd Elmouty and Mohammed H.H., which found that most patients did not know enough about preventive measures for retinopathy prior to the establishment of teaching sessions. But after the educational sessions, most of them knew a good deal about how to prevent retinopathy.

Such findings are in agreement with Aly A.A and Omairan A.M in 2022 about Efficacy of Instructional Platform Regarding Prevention of Retinopathy on Type II Diabetic Patient's Knowledge, Attitude, and Practice in the medical outpatient department of a private hospital at Jedda City in 2022 who studied 120 diabetic patients and demonstrated that the implementation of instructional platform for type 2 diabetic patients revealed a significant improvement in the patients' level of knowledge, attitude, and practice about retinopathy prevention post-instructional platform implementation compared to pre-instructional platform implementation.

Given the premise that education is crucial for raising awareness and plays a significant role in enhancing patients' knowledge, most participants in the study were university graduates. Consequently, they quickly grasped the necessary measures to prevent diabetic retinopathy, such as controlling blood sugar, blood lipids, and weight. The health education sessions conducted in this study demonstrated a positive impact on patients' understanding of preventive measures for retinopathy.

The present study had also revealed the attitude of the studied patients was statistically significantly improved in the post-test compared to pre-test scores in all tested items except items of Diabetic patient needs follow up with an internist, not an ophthalmologist , Poor vision is definitely due to diabetes , Timely treatment can prevent/ delay damage in eyes due to diabetes , Diabetic patient should not participate in violent physical activities , Regular control of blood sugar is important , Smoking can increase the risk of diabetic retinopathy , Diabetic retinopathy is completely cured , Mass media play important role in raise awareness of the community (p=0.059 , p=0.057 , p=0.325 , p=0.246 , p=0.062 , p=0.305 , p=0.236 , p=0.075) respectively . As evidence, post-test (94%, 92.6%, 89.6% respectively) of the studied patients had positive attitude related to regular control of blood sugar is important, timely treatment can prevent/ delay damage in eyes due to diabetes, persons with diabetes go for regular eye examinations.

Findings of the current study are similar to those of the study conducted by Said H.S and Hamed M.S in 2021 about Effect of an interventional program on diabetic patients' awareness regarding diabetic retinopathy in the diabetes clinic at Zagazig University hospital in 2021 as they concluded that the health educational sessions had a positive effect on patient's attitude regarding DR prevention. Similar findings were reported by Abd elmouty S.M and Mohammed H.H in 2022 as their study revealed that patients with DR had negative attitude score prior to the implementation of the educational sessions, but immediately after the implementation of the educational sessions they get a positive attitude score about DR.

These findings may be attributed to the majority of the participants were employees and lived with their families , so this give them the ability to have good attitude toward diabetes control and therefore diabetic retinopathy prevention .

The present study had also revealed significant improvement in the studied patients' practices regarding Diabetic Retinopathy post-test than pre-test in all tested items except items of walking and running exercise (p=0.091 , p=0.129) , items of visiting an internist once or twice a year to follow up on diabetes(p=0.051 , p=0.062) , Also except items of consulting any specialist or general practitioner in case of eye problem (p=0.127 , p=0.235) respectively . As evidence, the highest percentages of studied patients (92.5%, 88.1%, 82.1% respectively) had satisfactory practices related to take diabetic medication regular, follow up on diabetes, and consult in case of eye problem respectively.

These study findings are congruent with those of Mohamed S.S , Mohamed R.F and Mohamed S.H in 2019 who performed their study on 60 patients attending at ophthalmology clinic at Benha University Hospital aiming to evaluate the impact of educational intervention program on DR patient's compliance. They declared that patients with diabetes practice were bad prior to the teaching sessions, but that practice improved post implementation of the educational session. Similarly, Abd elmouty S.M and Mohammed H.H in 2022 reported that diabetic patients had a satisfactory practice score regarding practice of the diabetic retinopathy preventive measures after implementing of the educational sessions, with highly statistically significant differences compared to before implementation.

These findings may be attributed to the higher number of female respondents because the health seeking behaviors of females tend to be better than males, and this explain the larger population of females in this study.

The present study revealed no statistically significant relation between attitude regarding diabetic retinopathy with medical and family history of the studied patients , But there was statistically significant relation between patients' knowledge and their medical history of feet sores, Numbness of feet, and weight loss (p= 0.001, p= 0.004, p= 0.001) pre-test , also in relation between patients' knowledge and their family history of diabetes (p=0.002). And there was statistically significant relation between the studied patients' practice regarding Diabetic Retinopathy with their medical history of visual problems (p= 0.025) post-test.

Such findings are in agreement with Assem A.S , Tegegne M.M , Alemu D.S, Woredekal A.T and Tefera T.K in 2020 that showed highly significant association between Family history of DM with knowledge of the participants with (P=0.05) .

The patients' knowledge enriched about diabetic retinopathy due to their family history of diabetes which considered one of the risk factors that increase the incidence of DM and therefore its complication.

Regarding the total scores regarding diabetic retinopathy pre- and post-educational sessions, the present study revealed that the majority of cases have significant improvement in the studied patients' knowledge compared with pre-sessions results (p= 0.006). The figure illustrates that nearly one fifth of the studied patients had good knowledge pre- sessions which improved to half of them had good knowledge post sessions.

Furthermore, there was significant improvement post- sessions in the studied patients' attitude compared with pre- sessions scores (p= 0.008). The figure clarifies that more than two fifth of them had positive attitude which improved to the most of them had positive attitude post- sessions. Regarding practice, there was significant improvement post- sessions in the studied patients' practice compared with pre-sessions results (p= 0.009). As evidence, less than half of the studied patients had satisfactory practice pre- sessions which improved to the most of them had satisfactory practice post- sessions.

Such findings are in agreement with Ahmed N.G , Hamza M.F and Hassan S.N in 2023 who studied 136 diabetic patients and demonstrated a significant improvement in the mean scores of studied patients' knowledge, attitude and practices regarding preventive measures of DR in the post and follow-up prevention guidelines implementation phases compared to pre-prevention guidelines implementation phases.

In the same line, Abd Elmouty and Mohammed (2022) reported that diabetic patients initially exhibited poor knowledge, improper practices, and negative attitudes towards diabetic retinopathy before attending educational sessions. However, following the implementation of these sessions, patients showed significant

improvements in knowledge, practices, and attitudes towards diabetic retinopathy. This improvement persisted even during follow-up assessments, with highly statistically significant differences observed.

CONCLUSION

Based on the findings of the current study, Diabetic patients who attend the retinopathy prevention educational sessions , There was a highly statistically significant improvement in patient's knowledge , attitude and reported practice toward diabetic retinopathy after implementation of preventive sessions compared to before attending the sessions (p=0.001) . In addition to that, there was a statistically significant correlation between patient's knowledge and attitude (p=0.019) . Also, there is a statistically significant relation between patient's attitude and their marital status (p=0.030) . finally there was significant relation between patient's practice and their medical history of visual problems (p=0.025) .

RECOMMENDATION

Recommendation based on the findings of the study:

- Provide periodic training programs to improve, update and refresh their knowledge and performance regarding the care of the diabetic patients regarding the avoidance of diabetic retinopathy.
- Design a simple booklet includes the most important instructional points regarding the care of the diabetic patients in risk of developing diabetic retinopathy should be given to all patients to enhance the preventive behaviors of retinopathy.
- Develop an educational sessions for diabetic patients about diabetic retinopathy and the essential daily living activities to improve their knowledge which leads to decrease the possible visual complications.

Further recommendations

Develop health educational sessions for patients to raise diabetic patient's knowledge regarding retinopathy prevention for a longer period of time in different settings .

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جلسات تثقيفية للوقاية من اعتلال الشبكية لدي مرضي السكري البالغين في مستشفي الرمد ببورسعيد

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الخلفية : اعتلال الشبكية هو نتيجة مدمرة لمرض السكري الذي يعد أحد الاسباب الرئيسية للعمي علي مستوي العالم . **الهدف :** استكشاف تأثير الجلسات التعليمية للوقاية من اعتلال الشبكية علي المعرفة والمواقف والممارسة لدي مرضي السكري البالغين . **طرق البحث :** تصميم شبه تجريبي مع الاختبار القبلي والبعدي . مكان الدراسة : اجريت الدراسة في مستشفي الرمد ببورسعيد . **عينة البحث :** عينة هادفة من 67 مريض سكري كانوا في العيادات الخارجية الطبية . **الادوات :** تم استخدام ثلاث أدوات لجمع بيانات هذه الدراسة علي النحو التالي , الاداة الاولي :استبيان منظم للمقابلة لتقييم الخصائص الاجتماعية والديموغرافية للمرضي و التاريخ الجراحي والعلاجي والعائلي وايضا المعلومات حول اعتلال الشبكية السكري الاداة الثانية : تقييم سلوك المرضي حول الوقاية من اعتلال الشبكية السكري .الاداة الثالثة: ممارسة مرض السكري للوقاية من الاعتلال الشبكي. **النتائج :** كشفت هذه الدراسة ان 40.3% من المرضي تتراوح اعمارهم بين 40و50 عاما . في الاختبار القبلي , كان لدي المرضي وعي محدود حول اعتلال الشبكية السكري و لكن هذا تحسن بعد الجلسات التعليمية . تحسنت ممارسات واتجاهات مرضي السكري بشكل ملحوظ بعد حضور جلسات التثقيف الصحي . **الاستنتاج :** أظهر مرضي السكري الذين حضروا جلسات الوقاية من اعتلال الشبكية معرفة أكبر وتحسن في الممارسة وأظهروا درجات سلوك ايجابية أعلي مقارنة بما كانوا عليه قبل حضور الجلسات . **التوصيات :** برنامج تثقيفي صحي للمرضي لرفع وعي مرضي السكري فيما يتعلق بالوقاية من اعتلال الشبكية لفترة اطول من الزمن في مناطق وبيئات مختلفة .

الكلمات المرشدة: مرضي السكري – جلسات تثقيفية – الوقاية من اعتلال الشبكية السكري .