

## Effect of Educational Sessions about Prevention of Retinopathy on Knowledge, Attitude and Practice of Diabetic Patients

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### Abstract

**Background:** Retinopathy is a devastating consequence of diabetes that is one of the main causes of blindness globally. As a result, it's critical to raise patient awareness of retinopathy prevention and the significance of regular follow-up. **Aim:** To evaluate the effect of educational sessions about prevention of retinopathy on knowledge, attitude and practice of diabetic patients. **Study design:** This study was designed as a quasi-experimental. **Sampling:** The study subjects comprised of 120 diabetic patients who were at the medical outpatient clinics by using a purposive sampling technique. **Tools:** Four tools were developed by the researcher for collecting the data of this study as the following: tool one was a structured interviewed questionnaire that assessed patients' socio-demographic data, medical & family history. Knowledge assessment structured interview questionnaire was the second tool. Self-reported practices sheet was the third tool. Attitude Likert scale about prevention of retinopathy was the fourth tool. **Results:** This study revealed that, 41.5 percent of the patients were between the ages of 40 and 50. In the pre-test, patients had limited awareness about diabetic retinopathy, but this improved following the educational sessions. Diabetic patients' practice and attitude improved significantly after attending the health education sessions. **Conclusion:** Diabetic patients who attend the retinopathy prevention exhibited greater knowledge, improved practice and showed higher positive attitude scores compared to before attending the sessions. **Recommendation:** Health education sessions raise diabetic patient's awareness regarding retinopathy prevention by approaching camping in rural and urban areas.

**Keywords:** Educational session - Effect - Knowledge - Practice - Retinopathy.

### Introduction

Retinopathy is one of the most common and devastating complications of diabetes, as well as a primary cause of blindness worldwide. It is estimated that globally around 35% of all diabetic patients develop some form of diabetic retinopathy (Guanda, 2017; Fenner et al., 2018). This disorder is caused by damaging the retina of the eyes, which may cause vision impairment (Thompson, 2017).

People with poor glycemic control are more prone to develop diabetic retinopathy. According to an Australian study, diabetics with poor glycemic control were three to four times more likely than those with better control to develop diabetic retinopathy (Fenwick et al., 2017). In addition to, long-term diabetes mellitus, hypertension, dyslipidemia, nephropathy and gender are all key risk factors for the development and progression of diabetic retinopathy (Ahmed, Khalil & Al Qahtani, 2016 ;Voigt et al., 2018 ).

There are many symptoms of diabetic retinopathy included seeing spots or floaters, blurred vision, a dark or empty spot in the center of vision and difficulty seeing well at night (Al Zarea 2016; Al-Asbali et al., 2020). There are often no visual signs in the early stages of diabetic retinopathy. Diabetic retinopathy is associated with a reduction in productivity and quality of life, as well as an increase in socioeconomic burden (Olokoba, 2017; El-Deeb , 2018).

Screening regularly for diabetic retinopathy risk factors such as blood glucose and blood pressure, promoting lifestyle modification and pharmacological regimen as needed to optimize glycemic control, and making a prompt diagnosis of diabetic retinopathy are all important preventive strategies for diabetic patients (American Optometric Association 2017; Beaser et al., 2018). Furthermore, early detection of diabetic retinopathy, which improves the patient's

quality of life, is a key strategy for preventing blindness. It can be avoided by having a standard dilated fundus examination at the time of diabetes diagnosis, and all individuals with type 2 diabetes should have an eye exam at least once a year following these first examinations. (Almalki, Almalki & Alswat, 2018).

It is critical to have a thorough understanding of this widely spread disease in order to improve early detection and treatment. Patients with a higher-than-average understanding of the condition were found to have a positive attitude and a good practice pattern, allowing them to present earlier in their illness's course. In addition, patients with a lack of awareness showed poorer control of diabetic retinopathy risk factors (Ahmed, Khalil & Al Qahtani, 2016; Bakkar et al., 2017; Duan et al., 2020).

Early detection and prevention of potential visual impairment are all dependent on the level of awareness and information of diabetic retinopathy. The knowledge of diabetic retinopathy has been proven to have a positive impact on retinopathy preventive efforts (Bakkar et al., 2017). Furthermore, health education has become an essential component of the healthcare system. Effective health outcomes can be achieved with the design and implementation of the advanced health promotion source. The main goals of any health promotion program are to prevent disease, improve lifestyle and reduce disease-related cost burdens on individuals, families, and society (Nutbeam, 2019).

Community health nurses have played an important role in the prevention of diabetic retinopathy by educating patients about the disease's nature, the importance of preventing diabetic retinopathy through the control of modifiable risk factors, adherence to follow-up, periodic eye examinations and retina screening to detect any abnormalities early (Alzahrani et al., 2018).

#### **Significance of the study:**

Recent estimates in Egypt showed that 55.7 percent of diabetic patients with type 2 diabetes have retinopathy (Said & Hamed, 2021). It develops in more than 75% of

individuals with type 2 who survive for over 20 years with the disease (Al Kot & Fahim, 2015). Diabetic retinopathy is considered the fifth leading cause of visual impairment and the fourth leading cause of blindness in the world. In addition to loss of productivity, it has negative impact on the patient's quality of life leading to additional socioeconomic burden on the community. Lack of health education and dominance of wrong beliefs adversely affect the progression of diabetic eye complications among the Egyptian patients (Khalaf et al., 2019).

Health education is an important instrument of public health for motivating people to protect themselves from health problems. It has the upper hand in raising awareness about diabetic retinopathy in turn improves the compliance of the patients regarding continuous periodic clinical examination, so it could be prevented. Appropriate patient education and mass health education are needed to encourage those at risk to seek appropriate and timely care (Geethadevi et al., 2018). Therefore, it's crucial to teach diabetic patients about the signs and symptoms of diabetic retinopathy, as well as the risk factors and preventative actions.

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

The aim of the study was to evaluate the effect of educational sessions about prevention of retinopathy on knowledge, attitude and practice of diabetic patients.

#### **Operational definition**

Retinopathy is any damage to the blood vessels of the light-sensitive tissue at the back of the eye which may cause vision impairment and blindness. It is an ocular complication of systemic disease as seen in diabetes.

#### **Hypotheses**

To fulfill the aim of this study, three hypotheses were tested:

**Hypothesis I:** Diabetic patients who participate in the educational sessions about retinopathy will exhibit higher knowledge scores after the educational sessions than before.

**Hypothesis II:** Diabetic patients who participate in the educational sessions about retinopathy will exhibit higher practice scores after the educational sessions than before.

**Hypothesis III:** Educational session will be an effective approach for changing diabetic patients' attitude about retinopathy prevention.

## Subjects and Method

### Research Design

A quasi-experimental design (one group pre-post-test) was used in this study.

### Study Setting

This study was conducted at the medical outpatient clinics of Specialized Medical Hospital - Mansoura University. Medical outpatient clinics provide free services to diabetic patients. They are located on the ground floor and consist of a waiting hall with approximately 30 chairs and 3 examination rooms used for routine medical examination. Each examination room consists of three coach chairs, a weight scale, a sphygmomanometer, and blood glucose apparatus. The medical outpatient clinics are open all days of the week, from 9.00 a.m. to 2.00 p.m., except for Saturday, Thursday and Friday.

### Sampling

A purposive sample of 120 patients with diabetes was recruited. Patients were eligible to enroll in the current study if they met the following inclusion criteria: newly diagnosed of diabetes type 2, patients with diabetes aged from 20 to 60 years old, both sex and duration of disease does not exceed five years. Exclusion criteria include patients with eye diseases like obscuring retinal, cataract & glaucoma.

### Sample Size:

Based on data from literature (*Khalaf et al., 2019*), considering level of significance of 5%, and power of study of 80%, the sample size can be calculated using the following formula:  $n = \frac{(Z_{\alpha/2} + Z_{\beta})^2 \times 2 \times (SD)^2}{d^2}$  where, SD = standard deviation obtained from previous study;  $Z_{\alpha/2}$ , for 5% this is 1.96;  $Z_{\beta}$ , for 80% this is 0.84 and d, for the expected difference.

Therefore,  $n = \frac{(1.96 + 0.84)^2 \times 2 \times (1.8)^2}{(0.651)^2} = 119.9$ .

Based on the above formula, the sample size required in the current study is 120.

### Data Collection Tools:

Four tools for data collection utilized to conduct the present study.

**Tool I:** A structured Interviewing questionnaire. The researchers developed this questionnaire after reviewing the related literature (*Gupta & Chhikara, 2018*). The interviewing questionnaire consisted of two parts: the first part was concerned with patient socio-demographic characteristics such as age, marital status, educational level, occupation, and residence. The second part encompassed the medical history of the patient, family history of diabetes, duration of the disease and types of treatment.

**Tool II:** knowledge assessment structured interview questionnaire was used to assess patients' knowledge regarding diabetic retinopathy *Geethadevi et al., (2018)*. It includes manifestations, predisposing factors as well as preventive measures of diabetic retinopathy. Questions were marked as one point for true answer and zero point for wrong or do not know. The total score of knowledge was 48 grades. The total score of knowledge was 48 grades. The cut of point, the knowledge level was categorized into poor level scores less than 50% of the total scores, fair level scores equal 50% to less than 65% of the total sores and good level with scores more than 65% of the total scores.

**Tool III:** Self-reported practices sheet was used to assess patients' practices regarding retinopathy prevention (*Khalaf et al., 2019*). It includes periodic measuring blood pressure, blood sugar, medical examination, administer diabetic medication as prescribed, regular eye fundus examination, frequency of dilated eye checkup & fluorescent angiogram. One mark was awarded for each correct response to practice questions. The total score of practices was 7. For the practice level score about retinopathy prevention: improper < 60 % while proper  $\geq$  60 %.

**Tool IV:** Attitude Likert scale for diabetic patients about retinopathy prevention (Srinivasan et al., 2017). It includes three point-scale consisted of positive and negative items. Positive as; patients with diabetes need periodic follow up, type 2 diabetes leads to diabetic retinopathy if not treated properly & diabetic retinopathy can be prevented, while negative as; type 2 diabetes rarely loses sight and patients with diabetes should not participate in violent physical activities & good vision definitely does not mean that patient have diabetic retinopathy. 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  $\geq$  65%.

**Validity:** Content validity of the developed tools was tested by a jury of five experts in the field of community health nursing and the required modifications were carried out.

**Reliability:** The tools were assessed by Cronbach's alpha to assess the internal consistency of the tools, which was 0.91 for Tool II, "knowledge structured interview questionnaire"; 0.90 for the tool III "Self-reported practices checklist"; 0.92 for the fourth tool "Attitude Likert scale of diabetic patients"

**Pilot Study:** Pilot study was conducted on 12 diabetic patients (10% of the sample size) 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.

**Fieldwork:** Four phases were performed to fulfill the research aim, namely, the preparatory, assessment, implementation, and evaluation phases. These phases were initiated in the beginning of January 2019 and completed at the end November 2019.

### *Preparatory phase*

During the preparatory phase, we collected relevant national and international literature related to the study, designed, and validated the tools, and finally conducted the pilot study.

Based on a review of literature, teaching sessions on retinopathy prevention were created. The health information delivered during the instructional sessions was prepared based on patients identified needs during the pretest and reinforced by a colorful booklet. It was prepared in a simple Arabic language and covered the following: meaning of diabetic retinopathy, causes, types, manifestation, stages, and predisposing factors as well as preventive measures.

### *Interviewing and assessment phase*

The researchers went to the previously mentioned settings and met eligible patient individually and invited them to participate in the study. After they agreed to participate, the researcher informed them again about the purpose of the study and the time required for participation through three educational sessions in three weeks.

A written informed consent was given to the diabetic patients. The administrator authority at the medical out-patient clinic found a place for conducting the educational session. The place is often a meeting room consisting of a big table with chairs surrounding in a calm well ventilated environment. Tools were distributed to the recruited diabetic patients as a baseline assessment of retinopathy knowledge, practice, and attitude. Finally, the researchers provided all diabetic patients with contact information and asked them for their phone number. The researchers informed the diabetic patients that contact information would be used to remind them of the date and time of the follow-up. Diabetic patients also were permitted to contact the researcher at any time.

### *Implementation phase*

The colored retinopathy prevention booklet was given to the d patients before initiating the health education sessions. The educational sessions were split into three

sessions. Each session was conducted in small groups of (5–10) patient only and lasted from 30 to 40 minutes. At the end of each session an appointment was determined by the researchers and their participants to the next session. The first session objective was provided in the introductory session about diabetic retinopathy and its magnitude in Egypt. In addition, the knowledge related to retinopathy meaning, causes, types, and manifestations. The second session objective was to illustrate predisposing factors as well as preventive measures of diabetic retinopathy. The third educational session was providing the patients with the general instruction about retinopathy prevention issue as importance of follow up and screening methods like periodic measuring of blood glucose level and regular eye fundus examination. Teaching methods included in the educational sessions were small group discussions, brainstorming and using a power point presentation. After the session, an additional 10 Minutes was offered for answering more questions.

#### **Evaluation Phase**

The effectiveness of the retinopathy prevention educational sessions was evaluated directly after the session by using the same tools used prior the implementation of the sessions that related to diabetic retinopathy knowledge questionnaire (tool II), third and fourth tools, self-reported practices checklist and attitude Likert scale of diabetic patients regarding retinopathy prevention.

Follow up was done after three months post session implementation by using the same questionnaire by interviewing each patient individually at the medical outpatient clinic and otherwise by telephone. The number of dropouts was 17 diabetic patients due to some patients had withdrawn from the study and other patients were died.

#### **Ethical Considerations:**

An ethical approval letter attained from Research Ethics Committee, Faculty of Nursing-Mansoura University to conduct the research. Formal permission was obtained from directors of the specialist Medical Hospital. Written consent obtained from every participant involved in the study after clarification the purpose of the research. All

diabetic patients reassured about the confidentiality of the collected data and they were told that they had the right to refuse participation at any time.

#### **Statistical analysis**

The collected data were coded, entered and analyzed by personal computer using Stand for statistical product and service solutions (SPSS) program version 20 and were presented by simple frequency tables. Chi-square test was used for comparison of variables with categorical data. Statistical significance was set at  $p < 0.05$ . In addition, A highly significant level value was considered when  $p < 0.001$ .

#### **Results**

**Table 1** clarifies (41.7%) of the studied diabetic patients aged from forty to less than fifty years old, 55% of them were don't work, 41.7% of them were illiterate and 75.8% of them were married.

**Table 2** represents the family and medical history of the diabetic patients. The results revealed that 59.2% & 71.7% of the studied patients had family history of diabetes & hypertension respectively. 66.6% of them treated by hypoglycemic agents. 45.8% of the studied patients suffering from diabetes since one year.

**Table 3** concerning about knowledge score of the studied patients, which illustrates that, 17.5% of patients had good knowledge about the risk factors, while only 9%, 4% of them had good knowledge about symptoms, diagnosis, and treatment before the educational sessions respectively. After the implementation of the educational session a remarkable improvement was noticed in patient's level of knowledge as follow (90.8%, 91.7% 92.5% & 93.3%) in risk factors, treatment, diagnosis & manifestations respectively. Regarding patients' commitment to the follow up schedule the improvement was declined.

**Table 4** shows that, there was improvement in the studied patient's knowledge about retinopathy prevention in pre-educational session compared to post educational session and follow up tests. As regards to blood sugar control as preventive measures the correct answer of the patients improved from pretest (32.2%) to (87.9%) posttest. Only 4.2%, 6.7% & 10.0% respectively of them in the pretest reported

correct answer as they consider weight control, hypertension control and performing exercises are a preventive measure while increased in the posttest to 100%, 95.0 and 97.5 respectively.

**Figure 1** illustrates only 5.3% of the diabetic patients had good knowledge about retinopathy according to the pretest. Post intervention, majority (90.5%) of them had good knowledge with highly statistically significant difference ( $p = 0.001$ ).

**Figure 2** shows 24.4% of the diabetic

patients had proper practice about prevention of retinopathy according to the pretest. During follow-up, 77.3% of them had proper practice with a highly statistically significant difference ( $p = 0.001$ ).

**Figure 3** illustrates 28.5% of the diabetic patients had positive attitude about retinopathy prevention according to the pretest. Post intervention, become 92.6 % of them had positive attitude with highly statistically significant difference ( $p = 0.001$ ).

**Table 1:** Socio-demographic characteristics of the diabetic patients

Item	N= 120	%
<b>Age</b>		
30- <40	28	23.3
40-< 50	50	41.7
50- < 60	30	25
≥ 60	12	10
<b>Sex</b>		
Male	37	30.8
Female	83	69.2
<b>Occupation</b>		
Don't work	66	55
Worker	45	37.5
Employer	9	7.5
<b>Marital status</b>		
Married	91	75.8
Widow	20	16.7
Divorced	9	7.5
<b>Educational level</b>		
Don't read & write	50	41.7
Read & write	32	26.7
Primary	19	15.8
Preparatory	10	8.3
Secondary	9	7.5

**Table 2:** Family and medical history of the diabetic patients.

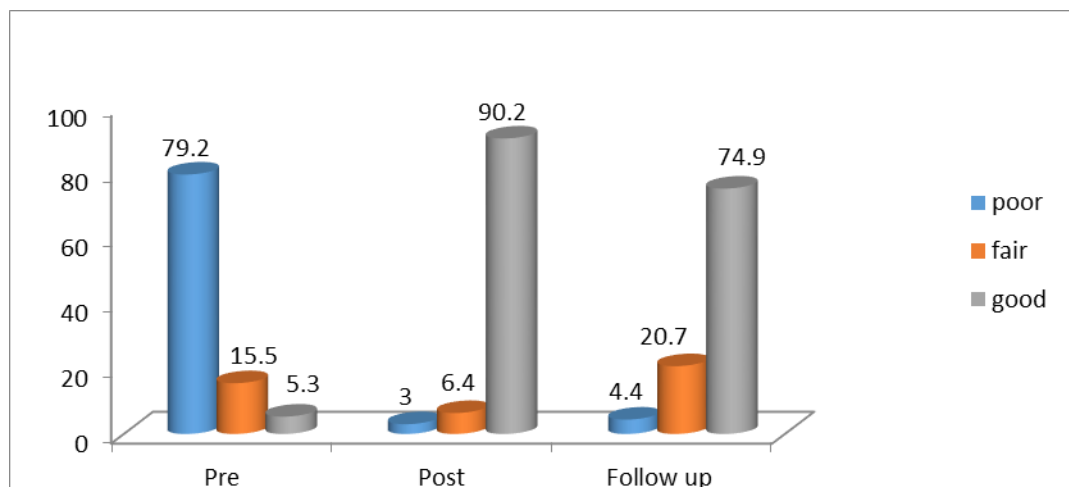
Item	N= 120	%
Diabetes mellitus	80	66.7
Glaucoma	20	16.7
Cataract	10	8.3
Hypertension	10	8.3
<b>Diabetic drugs</b>		
Hypoglycemic agents	70	58.3
Insulin	30	25
Eye drops	20	16.7
<b>Duration of diabetes</b>		
One year	55	45.8
Two years	24	20.0
Three years	14	11.7
Five years to more	27	22.5

**Table 3:** knowledge score level of the diabetic patients regarding retinopathy

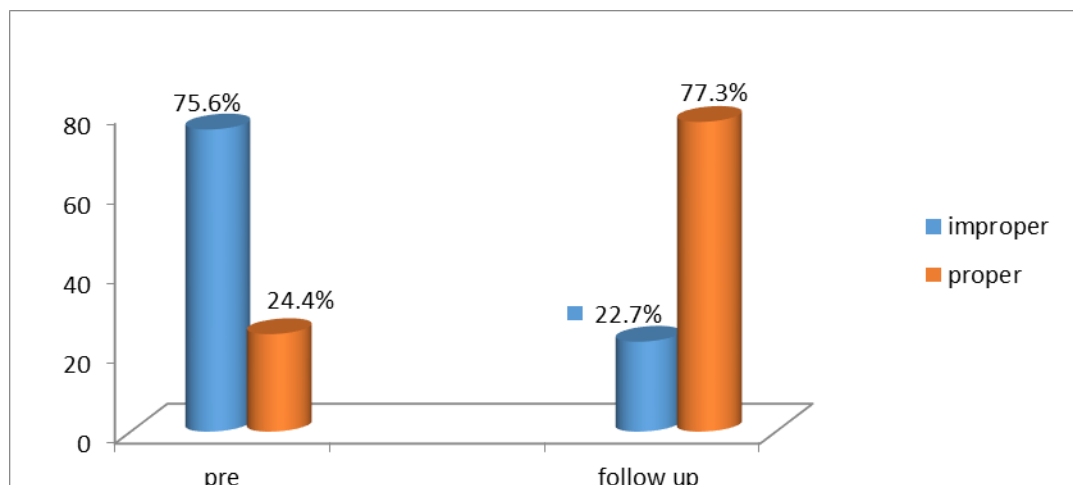
Items	Pre (120)			Post (120)			Follow up (100)			$\chi^2$ P- Value
	Poor	Fair	Good	Poor	Fair	Good	Poor	Fair	Good	
	N %	N %	N %	N %	N %	N %	N %	N %	N %	
Risk factors of diabetic retinopathy	94 78.3	5 4.2	21 17.5	2 1.7	9 7.5	109 90.8	19 19.0	5 5.0	76 76.0	173.560 < .001
Manifestations of diabetic retinopathy	98 81.7	13 10.8	9 7.5	6 5.0	2 1.7	112 93.3	11 11.0	19 19.0	70 70.0	226.108 < .001
Diagnosis of diabetic retinopathy	103 85.8	13 10.8	4 3.4	3 2.5	6 5.0	111 92.5	10 10.0	17 19.0	73 73.0	243.458 < .001
Treatment of diabetic retinopathy	97 80.8	19 15.8	4 3.4	3 2.5	7 5.8	110 91.7	7 7.0	26 26.0	67 67.0	251.468 < .001

**Table 4:** Diabetic patients' knowledge regarding prevention of retinopathy in relation to their pre - post and follow up sessions

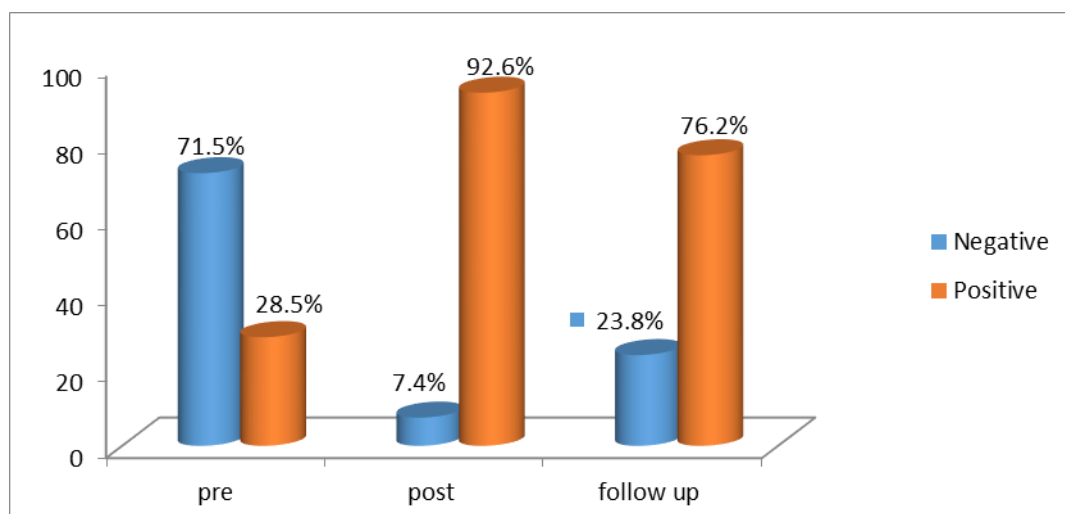
Items	Pre (120)		Post (120)		Follow up (100)		$\chi^2$ P- value
	No.	%	No.	%	No.	%	
Blood sugar control	18	15.0	120	100	85	85.0	254.928 < .001
Control blood lipid	3	2.5	115	95.8	75	75.0	194.490 < .001
Take drug at time	0	0	113	94.2	70	70.0	228.984 < .001
Weight control	5	4.1	120	100	74	74.0	240.992 < .001
Exercise	12	10.0	117	97.5	83	83.0	221.422 < .001
Balanced diet	2	1.7	118	98.3	73	73.0	243.663 < .001
HTN control	8	6.7	114	95.0	80	80.0	219.048 < .001
Stop smoking	0	0	116	95.8	77	77.0	252.089 < .001



**Figure 1.** Total knowledge level of diabetic patients regarding retinopathy



**Figure2.** Total practice level of diabetic patients regarding retinopathy



**Figure 3.** Total attitude level of diabetic patients regarding retinopathy



## Discussion

Raising diabetic retinopathy awareness is critical for early detection and treatment of this blinding illness. Appropriate health education is required to control or prevent vision loss and to urge persons at risk to seek prompt and appropriate care. (**Memon, Shaikh & Shaikh, 2015**). The present study evaluated the effect of educational sessions about prevention of retinopathy on diabetic patients' knowledge, attitude, and practice. The findings of the present study revealed the majority of the diabetic patients had poor knowledge about the disease before health education. This could be due to a lack of educational messages about diabetic retinopathy in the media, as well as a lack of awareness about the importance of health. The majority of the patients had good knowledge after the educational sessions. This result can be credited to the session's clarity and simplicity of language, as well as the appropriate teaching technique and instructional materials.

This study finding is consistent with a previous Quasi-experimental study conducted by **Khalaf et al., (2019)** on 200 patients with diabetes at Assiut to improve diabetic patient's knowledge regarding diabetic retinopathy by applying educational program. They reported that understanding level of the patients with diabetes in general was inadequate prior to the educational sessions, but their level of knowledge improved implementation of the sessions.

The patients should understand the measures needed to prevent diabetic retinopathy such as blood sugar control, blood lipid control, and weight control. The present study revealed that the majority of patients had insufficient knowledge about retinopathy preventive measures before the educational session implementation.

This could be owing to a lack of resources for retinopathy prevention, such as the media. Post educational session, the majority of the patient's had good knowledge about the prevention measures of retinopathy. This study finding is consistent with that of a previous quasi-experimental study conducted by **Said and Hamed (2021)** on 70 patients with

diabetes at Zagazig University hospital to evaluate the effect of intervention program for patients with diabetes to elevate their awareness regarding diabetic retinopathy. They concluded that the health educational sessions had a positive effect on patient's knowledge regarding the preventive measures of retinopathy.

Regarding to diabetic patients self-reported practices score towards retinopathy prevention, the present study finding showed that they had a satisfactory practice score regarding practice the diabetic retinopathy preventive measures after implementing of the educational sessions, with highly statistically significant differences compared to before implementation. This finding may be attributed to the effect of the sessions on improving patients with diabetes practice the preventive measures as eye fundus examination and measuring blood glucose levels on a regular basis. This study's findings are congruent with those of **Mohamed et al., (2019)** who conducted an experimental study on 60 patients with diabetes in Benha to improve their practices regarding the prevention of diabetic retinopathy using an educational session. They stated that patients with diabetes practice were bad prior to the teaching sessions, but that practice improved post implementation of the educational session.

As regards diabetic patients attitude score towards diabetic retinopathy, the present study found that patients with diabetic retinopathy had negative attitude score toward diabetic retinopathy prior to the implementation of the educational sessions, but immediately after the implementation of the educational sessions they get a positive attitude score about diabetic retinopathy and also at the follow-up stage, with highly statistical significance differences. This finding may be attributed to the effectiveness of the educational sessions and the clarity of the educational materials, which affected the participants' attitude configuration. The findings of the current study were similar to those of a previous quasi-experimental study conducted by **Said and Hamed (2021)** on 70 patients with diabetes at Zagazig University hospital to evaluate effects of interventional program on the awareness of patients with diabetes regarding diabetic retinopathy. They

concluded that the health educational sessions had a positive effect on patient's attitude regarding diabetic retinopathy prevention.

Thus, the aim of the present study was achieved through the present study findings, which revealed that total knowledge scores, practice scores and attitude scores were higher and positive after the educational session's implementation compared to before.

### Conclusions

Depending on the study findings, the study hypotheses were accepted. As there were significant improvements in the patients' level of knowledge, practices, and attitudes about retinopathy preventive measures.

### Recommendations

- Health education which aims to increase diabetic patients' knowledge and practice regarding the preventive measures of diabetic retinopathy should be provided in all health care services.
- Simple educational pamphlets and/or posters about diabetic retinopathy preventive measures should be provided for patients with diabetes in out-patient clinics.
- Further study is required to empower health screening for all diabetic patients in different age group for early detection of diabetic retinopathy at different setting.

### Acknowledgment

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