

Effect of Educational Strategies on Diabetic Retinopathy Patients' Self-Care Practice and Quality of Life

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Abstract

One common and unique microvascular consequence of diabetes mellitus is diabetic retinopathy, which gradually progresses over time and can lead to permanent vision lost. Current study aimed to evaluate the effect of educational strategies on diabetic retinopathy patients' self-care practice, and quality of life. A quasi-experimental design (one group pre/posttest) was employed to achieve the study aim in an ophthalmology and diabetic outpatient clinic at Benha University Hospital, in Benha City Qalyubia governorate, Egypt on a purposive subject of 50 diabetic patients with retinopathy. The study used structured Interview Questionnaire, Diabetic Retinopathy Patients 'Self-care Practices Assessment., and the Vision Functioning related quality of life questionnaire. Results: The total mean of the patients' knowledge improved to 29.04 ± 7.29 , 25.42 ± 7.26 , and 24.62 ± 6.32 at immediate, 1st, and 2nd-month post-educational strategies implementation, respectively compared with before with statistically significant differences. The mean percentage score of the total self-care practices improved to 77.41%, 72.48% and 71.11% at immediate, 1st, and 2nd-month post-educational strategies implementation, respectively compared with before with significant differences. Along the same line, A statistically significant enhancement in their quality of life (QOL) was detected following the implementation of educational strategies ($p \leq .001$). The study group exhibited an improvement in overall knowledge and self-care practices after the educational strategies were implemented, with a highly significant and positive correlation to their total quality of life. The study recommended establish an educational program to instruct diabetic retinopathy patients on effective self-care practices to minimize complications. The study should be carried out for patients with diabetic retinopathy in various healthcare settings with a larger sample size.

Keywords: Diabetic Retinopathy, Educational Strategies, Quality of Life, Self-Care Practice.

Introduction:

Diabetic retinopathy (DR) stands as a highly common complication associated with diabetic ophthalmic disorder, occurring when the retinal tiny eye vessels are damaged due to extended periods of elevated blood sugar levels. These high glucose levels lead to blockages in the small vessels that supply blood to the retina,

reducing its blood flow. In response, the eye tries to form new vessels, however they grow abnormally and are prone to leakage (Abid et al., 2022).

The advancement and severity of diabetic retinopathy (DR) are closely linked to the length of time a person has diabetes, inadequate blood sugar management, high blood pressure, and elevated cholesterol

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levels. Diabetic retinopathy progresses through four distinct stages, beginning with mild, then moderate, followed by severe non-proliferative phases, and ultimately culminating in proliferative diabetic retinopathy (**Baiuomy et al., 2021**). Complications arising from diabetic retinopathy can result in severe visual problems, such as vitreous hemorrhage, retinal detachment, and glaucoma (**Jampol et al., 2020; Mohamed et al., 2019**).

Alongside effective medical intervention to control blood glucose, cholesterol levels, blood pressure, and various intraocular treatments have become standard for addressing diabetic retinopathy (**Lin et al., 2021**). Current approaches to treating DR focus on controlling microvascular complications and include intravitreal medications, laser photocoagulation, and vitrectomy (**National Eye Institute, 2024**).

Managing self-care practices is essential for controlling diabetic retinopathy (DR) and preventing its complications. Ophthalmic nurse educators play a crucial role in helping DR patients achieve competence and maintain long-term adherence to self-care management. Patients should adopt and continue a comprehensive range of self-care activities, including monitoring blood glucose levels, regular health checkups, eye care, proper medication usage, a balanced diet, and physical exercise (**Al Baiuomy et al., 2019**).

Visual impairment caused by diabetic retinopathy, especially in its advanced stages, significantly affects health-related quality of life (HRQOL), influencing daily activities as well as physical, and psychosocial well-being (**Cooper & Singh, 2021**). Nursing responsibilities should focus on teaching patients about diabetic

retinopathy regarding the nature of the illness to raise their awareness, emphasize the importance of follow up for controlling of DR progression and describing in detail, because this can reduce the risk of its subsequent complications as vision loss (**Safaan et al., 2023**).

Significance of the Study

The incidence of chronic complications from diabetes in Egypt, including retinopathy, ranges between 8.1% and 41.5%. This issue is becoming a significant public health concern due to factors like rising central obesity rates, sedentary lifestyles, low health literacy, restricted healthcare funding, and poor treatment compliance. As a result, diabetic retinopathy, a microvascular complication of diabetes, is increasingly common among the Egyptian population (**Mostafa, 2022**). Approximately 900 patients with retinopathy visited the outpatient clinic at Benha University Hospital over the past two years (2021 and 2022) (**Benha University Hospital Statistical Office, 2022**). Thus, the objective of this study was to improve the understanding, self-care practice, and overall quality of life for individuals affected by diabetic retinopathy.

Aim of the study:

The present study conducted to evaluate the effect of educational strategies on diabetic retinopathy patients' self-care practice, and quality of life.

Research hypothesis:

The knowledge, self-care practices, and quality of life scores of patients with diabetic retinopathy will be improved after the implementation of educational strategies

compared to their scores prior to the intervention.

Subject and Methods

Research design:

A quasi-experimental research design involving one group with pre/post-intervention comparisons was utilized to accomplish the objectives of this study.

Study setting:

The study was conducted at the ophthalmology and diabetic outpatient clinic within Benha University Hospital, situated in Benha City, Qalyubia Governorate, Egypt.

Sample:

Based on predetermined criteria, 50 adult patients with a diagnosis of diabetic retinopathy were purposively sampled for this study within the previous six months.

Exclusion criteria: the following was excluded if they had any of the following: prior eye injuries that could impair retinal function as noted in their medical records, communication difficulties (speech or hearing issues) documented in their records, very severe non proliferative or proliferative stages of retinopathy characterized by significant blockage of retinal blood vessels leading to reduced blood flow, risk of fluid leakage (according to the **American Optometric Association, 2019**) as indicated in their records, or complete vision loss as recorded in their files.

Tools for data collection:

1. Structured interview questionnaire:

The researchers developed it based on (Safaan et al., (2023); Al-Eryani et al. (2023); Baiuomy et al. (2021), and Nordquist, (2017)). It was translated to

Arabic and back translated by the researchers. It involved three sections:

Part I: personal data features of DR Patients: This section focused on evaluating patient data related to age, gender, residence, and other relevant factors.

Part II: Assessment of Medical History: This part aimed to obtain patient's personal and family medical history. It consisted of 12 questions addressing issues such as complaints of other chronic diseases, previous hospitalizations, their causes, and types.

Part III: Assessment of Knowledge about Diabetic Retinopathy (Pre- and Post-Educational Strategies): This section aimed to evaluate patients' understanding of diabetic retinopathy, featuring 14 open-ended questions covering topics for example definition of DR, types, causes, risk factors of DR, and clinical manifestations.

Scoring system:

For the knowledge-related items, four scoring levels were applied to the questions, with each question rated from 0 to 3 points. An excellent response received three points, a good response earned two points, basic knowledge received one point, and an incorrect response was awarded zero point. The overall possible score for knowledge was 42 points, categorized as follows:

- Poor knowledge (less than 50%) = 0 to 20 points
- Fair knowledge (50% to less than 65%) = 21 to 27 points
- Good knowledge (65% to less than 80%) = 28 to 33 points
- Excellent knowledge (equal to or more than 80%) = 34 to 42 points

Tool II: Diabetic Retinopathy Patients 'Self-care Practices Assessment (pre and post-educational strategies): It include the following

Part I: Reporting self-care practices checklist: It was adapted from (Shaban,

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2018). It intended to assess the patient's self-care practices preventing complications. It encompasses 33 items categorized into four domains as follows: (self-monitoring of blood sugar (five questions), periodic health checkups (six questions), proper intake of medications (six questions), healthy diet (seven questions) and physical activity (nine questions)).

Scoring system:

Each patient was answered by four point Likert scale score as follows: "all the time" scored as three points; "most of the time" scored as two points;" some of the time" scored as one point, and "never" scored as zero point. The total score of self-care practice part I was 99 points. The total score was estimated and classified as follows:

- Poor practice (less than 60%) = 0 to 59 points.
- Fair practice (60% to less than 80%) = 60 to 79 points.
- Good practice (equal to or more than 80%) = 80 to 99 points.

Part II: Observational self-care practice checklist assessment. It was based on (Mehuys et al., 2020; Gwenthure & Shepherd, 2019; Abosree, 2017 and Shaw, 2016) and aimed to evaluate the self-care practices among DR patients, including washing hands, eye care routines, administering eye drops, and applying ointment. It was observed by the researchers and included 44 items. Scoring system: Each correctly completed step was worth two points; incomplete steps were for one point; and unfinished or wrong steps were worth zero. The overall score of the observed self-care practices was 88 points. It was estimated and converted into percent score, then classified as follows:

- Poor practice (less than 60%) = 0 to 52 points.

- Fair practice (60% to less than 80%) = 53 to 70 points.
- Good practice (equal to or more than 80%) = 71 to 88 points.

Tool III: Vision Functioning Related Quality of Life Questionnaire.

The researchers made modifications to the National Eye Institute Visual Functioning Questionnaire (Mangione et al., 2001). The aim of the study was to compare individuals with diabetic retinopathy before and after educational interventions in terms of their health and vision-related quality of life. It consists of 27 questions, split into seven domains as follows: General health and vision (five questions), difficulty with activities (seven questions), responses to vision problems (seven questions), near vision (two questions), distance vision (two questions), social limitation (two questions) and role limitation (two questions).

The total score for this tool was 103 points. It is estimated and transformed into percent score then classified as follows:

- Poor level (less than 60%) = less than 62 points.
- Fair level (60% to less than 85%) = 62 to less than 88 points.
- Good level (equal to or more than 85%) = 88 to less than 103 points.

Tools validity

The content and face validity of the tools were evaluated by five specialists (two professors and one assistant professor of medical-surgical nursing, faculty of nursing, one assistant professor of Medicine, and one professor of ophthalmology from the Faculty of Medicine, Benha University. The experts revised the tools to assess the relevance, clarity, simplicity, comprehensiveness, and applicability of the questions.

Reliability:

The knowledge assessment questionnaire's reliability showed a Cronbach alpha of 0.947, while Observational self-care practice checklist reveals a value of 0.848, and the quality of life measure yielding value of 0.895, indicating a "very good" level of reliability.

Pilot study:

The researchers conducts a pilot study on ten percent of the participants (five patients with DR) to assess the clarity and applicability of the tools, the time needed for the researchers to complete each tool, and identify any potential obstacles to data collection. Following the pilot study results, necessary adjustments were made to enhance the tools for more effective data gathering.

Ethical considerations:

This research was carried out following receiving initial ethical approval from the Scientific Research and Ethics Committee of the Faculty of Nursing at Benha University (Code: REC-MSN-P61). Consequently, administrative permission was granted from the director of neurological departments at Benha University Hospital. Ethical considerations were prioritized throughout the study. Each patient with diabetic retinopathy received information about the study's objectives and their right to discontinue participation at any time. Participants gave additional verbal agreement, and the researchers guaranteed the privacy of all information and the identity of every participant.

Field work:

After obtaining the required permissions, the investigator interviewed the participants to explain the research's purpose and sought their consent to participate and cooperate. Data collection took place over a six-month period, starting in early October 2023 and

concluding at the end of March 2024. This process was conducted in four phases.

I. Assessment phase (pre-educational strategies):

After explaining the study's purpose to all participants in clear Arabic, the researchers conducted individual interviews with the patients and assessed them using the structured interview questionnaire (Tool I) to gather information about their socio-demographic characteristics, medical history, and knowledge, as well as, asked about their self-care practice using tool II part I and observed the patients' practice for eye care using tool II part II. Finally, the researchers asked the patients about their quality of life using Vision Functioning Related Quality of Life Questionnaire a reference data assessment before the implementation of the program.

II. Planning phase:

After completing the initial assessment, the educational handout was tailored to meet the specific needs of each patient. The researchers developed a teaching plan that included both general and specific objectives. Additionally, teaching materials were created in the form of a poster and recorded video, which were saved on the patients' smartphones. Resources and facilities for the program were organized, including printed materials and an appropriate location for the sessions. Finally, the researchers established a schedule for the program sessions with the patients.

III. Implementation phase:

The educational strategies were delivered through five sessions, with each session lasting one hour and accommodating five patients. The researchers met with patients twice a week, conducting a total of 50 sessions. Patients participated in five sessions, with the first two covering general health education on diabetic retinopathy,

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including its definition, causes, diagnosis, treatment options, and potential complications. Session three included educating the patients about self-monitoring of the blood glucose, periodic medical examination, proper medication intake and healthy diet, and proper physical activity exercises. Session four was concerned with the practical part of hand washing, eye care, administering eye drops, and applying ointment. Session five focused on educating patients about ways to enhance their quality of life. Each session began with a review of the preceding discussion. A variety of instructional strategies, such as discussion, re-demonstrations, and demonstrations, were used. Instructional materials such as mobile videos, posters, and printed handouts featuring pictures were utilized, all presented in a clear and concise manner. The record was sent to each studied patient individually through a Telegram or WhatsApp to help them review and support teaching.

IV. Evaluation phase (post educational strategies):

Evaluation phase: The efficiency of educational strategies on the self-care practices and quality of life of DR patients was assessed. Each patient underwent four evaluations: the first was conducted before the educational strategies implementation. The second evaluation took place immediately after the educational strategies were implemented, using the same tools, then after first, second month after implementing the educational strategies on the patients' Comparing between pre and post-data collected.

Statistical analysis:

The Statistical Package for Social Sciences (SPSS), version 21 (SPSS Inc., Chicago, IL) was used to arrange, code, enter, tabulate,

and analyze the collected data. The analysis included number and percentage distributions, chi-square tests, means, standard deviations, and correlation coefficients. A paired t-test was utilized to compare the variables between the study phases. A significance level was established at $p < 0.05$ and $p < 0.001$.

Results:

Table (1): demonstrates that 56% of the participants were aged between 50 and ≤ 60 years, with a mean age of 48.48 ± 7.49 . Additionally, 80% of the DR patients were female, 76% were married, and less than three quarters (70%) from rural areas. Concerning their work 64% had no work, which 40% of them had illiteracy. 92% lived with their family.

Table (2): shows that 56% of the patients had a positive family history of DR. 76% of them had type 2 diabetes and 58% use insulin injections for their treatment. Regarding the comorbid disease, 52% of DR patients had hypertension. 40% of them had been diagnosed with DM from 10 – < 15 years ago, and 52% of them complained of diabetic retinopathy from 1 – < 5 years ago. Concerning their treatment, 74% of them use intravitreal medications for DR and 66% of them use medical glasses although 82% complained of blurred vision.

Table (3): revealed that, before the educational strategies implementation, patients had the mean score for knowledge about the general concept of DR 4.86 ± 2.06 , but the mean score was 2.18 ± 0.52 for clinical features and physical examination of DR. After the implementation of educational strategies, the mean score for clinical features and physical examination of DR increased to 3.68 ± 1.08 immediately post-implementation, but then declined to 2.96 ± 0.83 and 2.80 ± 0.81 at 1st and 2nd months,

respectively. The table also reveals an increase in total mean score of patients' knowledge of 13.26 ± 4.96 from pre-educational strategies implementation to 29.04 ± 7.29 , 25.42 ± 7.26 and 24.62 ± 6.32 , respectively on immediate post, 1st and 2nd-month post educational strategies application with a statistically significant difference between posttest compared to pretest score after implementing the educational ($p < 0.001$).

Table (4): demonstrates that the mean score was 14.08 ± 1.59 regarding healthy prescribed food, but the mean score was 6.10 ± 1.73 regarding periodic medical examination pre-educational strategies implementation. On the other hand, it improved to become (16.48 ± 1.88 , 15.22 ± 1.88 , and 15.06 ± 1.92) and (12.66 ± 2.41 , 12.32 ± 2.28 and 12.14 ± 2.07), respectively on the immediate post, 1st and 2nd-month post educational strategies implementation with a statistical significance difference ($p < 0.001$). The table also reveals an increase in total mean score of reported self-care practice of 52.0 ± 4.22 from pre-educational strategies implementation to 74.36 ± 10.07 , 70.42 ± 9.35 , and 68.56 ± 8.83 , respectively on immediate post, 1st and 2nd-month post educational strategies application.

Table (5): shows the mean score pre-educational strategies implementation concerning patients' practices about applying eye ointment and instilling eye drops as follows mean 18.46 ± 3.56 and 17.90 ± 3.80 , respectively but the mean score was 5.60 ± 1.40 regarding performing eye care and increased at the immediate post, 1st and 2nd-month post educational strategies implementation to 8.24 ± 1.15 ,

7.40 ± 1.36 and 7.12 ± 1.27 , respectively. The table also reveals an increase in total mean score of self-care practice observational checklist of 52.98 ± 8.35 from pre-educational strategies implementation to 70.40 ± 7.32 , 65.12 ± 7.27 and 64.42 ± 5.95 , respectively on immediate post, 1st and 2nd-month post educational strategies implementation with highly significant differences in all of the self-care practices ($p < 0.001$).

Figure (1): illustrates that, the patients' overall self-care practices were improved with 56.14% of total scores at pre-educational strategies implementation and then increased to 77.41% and 72.48% of total scores at immediate and 1st month post-educational strategies implementation, respectively, and slightly declined to 71.11% on 2nd-month post-educational strategies implementation.

Figure (2): illustrates the quality of life among studied patients, that was improved to 61.66% & 59.39% during 1st month and 2nd-month post-educational strategies implementation, respectively, while pre-educational strategies implementation was less than half (42.03%).

Table (6) demonstrates a strong positive correlation between the total knowledge and total practice score of the DR patients pre and post-educational strategies implementation ($P < 0.001$). The table also reveals a strong positive correlation between the total knowledge score and total practices with their life quality post-educational strategies implementation while there was no statistical significant correlation between the total knowledge score of total knowledge and total practices with their quality of life pre-educational strategies.

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Table (1): Frequency and percentage distribution of diabetic retinopathy patients' socio demographic features (n = 50).

variables	No.	%
Age (years)		
30-<40	6	12.0
40-<50	16	32.0
50-≤60	28	56.0
Mean ± SD.	48.48 ± 7.49	
Gender		
Male	10	20.0
Female	40	80.0
Residence		
Rural	35	70.0
Urban	15	30.0
Marital status		
Single	1	2.0
Married	38	76.0
Widow	11	22.0
Education level		
Illiteracy	20	40.0
Read and write	7	14.0
Preparatory education	4	8.0
Secondary education	13	26.0
University education	6	12.0
Nature of work		
Mental work	2	4.0
Technical work	16	32.0
No work	32	64.0
Who do you live with		
Alone	4	8.0
With family	46	92.0

Table (2): Frequency and percentage distribution of diabetic retinopathy patients' medical history (n = 50)

Medical history	No.	%
Family history with diabetic retinopathy	28	56.0
Degree of relation #		
No	12	24.0
Father	6	12.0
Mother	12	24.0
Brother/sister	8	16.0
Grandfather/grandmother	4	8.0
Type of diabetes		
Type I diabetes	12	24.0
Type II diabetes	38	76.0
Comorbid diseases #		
None	13	26.0
Hypertension	26	52.0
Kidney disease	4	8.0
Pulmonary disease	4	8.0
Atherosclerosis	19	38.0
Gastrointestinal diseases	3	6.0
Time since diagnosis (years)		
5 –< 10	11	22.0
10 –< 15	20	40.0
≤ 15	19	38.0
Time since complaining of diabetic retinopathy		
<1 year	20	40.0
1 –< 5	26	52.0
5 –< 10	4	8.0
≤ 10	0	0.0
Main complain #		
Dark spots or threads floating in your field of vision (floaters)	32	64.0
Blurred vision	41	82.0
Poor night vision	12	24.0
Note that the colors appear faded	3	6.0
Light intolerance	13	26.0
Sudden flash in vision field	7	14.0
Eye pain	14	28.0
Medical treatment for DM		
Oral hypoglycemic	19	38.0
Insulin injection	29	58.0
Oral hypoglycemia and insulin injection	2	4.0
Blood glucose level		
Very high	10	20.0
High	25	50.0
Controlled	15	30.0
Medical treatment for retinopathy #		
Laser treatment	25	50.0
Intravitreal medications	37	74.0
Surgery (vitrectomy)	3	6.0
Using medical glasses		
No	17	34.0
Yes	33	66.0

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Table (3): Comparison of the diabetic retinopathy patients' knowledge throughout the program phases (n = 50).

Patient knowledge	Total score	Pre	Post		Relation				
		Mean ± SD.	Immediately Mean ± SD.	1 st month Mean ± SD.	2 nd month Mean ± SD.	p1	p2	p3	p4
General concept about DR.	(0- 12)	4.86 ± 2.06	8.64 ± 2.38	8.14 ± 2.96	8.24±2.55	<0.001*	<0.001*	<0.001*	<0.001*
Clinical features and physical examination of DR.	(0- 6)	2.18 ± 0.52	3.68 ± 1.08	2.96 ± 0.83	2.80 ± 0.81	<0.001*	<0.001*	<0.001*	<0.001*
Management of DR.	(0- 15)	3.22 ± 2.53	10.06 ± 3.75	8.68 ± 3.32	8.28 ± 3.29	<0.001*	<0.001*	<0.001*	<0.001*
Preventive measures of DR complications	(0- 9)	3.0 ± 0.86	6.66 ± 1.08	5.64 ± 1.32	5.30 ± 1.23	<0.001*	<0.001*	<0.001*	<0.001*
Total mean score	(0- 42)	13.26 ± 4.96	29.04 ± 7.29	25.42 ± 7.26	24.62 ± 6.32	<0.001*	<0.001*	<0.001*	<0.001*

SD: Standard deviation.

P1: Relation between pre and immediate post

P2: Relation between pre and 1st month post P3: Relation between pre and 2st month post

P4: Relation between pre and all (average) post

Table (4): Comparison of the diabetic retinopathy patients reported self-care practices throughout the program phases (n = 50).

Patients reporting self-care practice	Total score	Pre	Post		Relation				
		Mean ± SD.	Immediately Mean ± SD.	1 st month Mean ± SD.	2 nd month Mean ± SD.	p1	p2	p3	p4
Self-monitoring of blood sugar.	(0- 15)	7.34 ± 1.73	11.74 ± 1.74	11.26 ± 1.58	10.56 ± 1.36	<0.001*	<0.001*	<0.001*	<0.001*
Periodic medical examination.	(0- 18)	6.10 ± 1.73	12.66 ± 2.41	12.32 ± 2.28	12.14 ± 2.07	<0.001*	<0.001*	<0.001*	<0.001*
Commitment to taking appropriate treatment.	(0- 18)	12.18 ± 1.21	14.68 ± 1.71	13.74 ± 1.50	13.38 ± 1.66	<0.001*	<0.001*	0.001*	<0.001*
Healthy prescribed food	(0- 21)	14.08 ± 1.59	16.48 ± 1.88	15.22 ± 1.88	15.06 ± 1.92	<0.001*	0.018*	0.070	<0.001*
Sports and physical activity.	(0- 27)	12.30 ± 2.07	18.80 ± 3.46	17.88 ± 2.82	17.42 ± 3.04	<0.001*	<0.001*	<0.001*	<0.001*
Total mean score	(0- 99)	52.0 ± 4.22	74.36± 10.07	70.42 ± 9.35	68.56 ± 8.83	<0.001*	<0.001*	<0.001*	<0.001*

SD: Standard deviation.

P1: Relation between pre and immediate post

P2: Relation between pre and 1st month post P3: Relation between pre and 2st month post

P4: Relation between pre and all (average) post

Table (5): Comparison of the diabetic retinopathy patients reported self-care practices throughout the program phases (n = 50).

Variable	Total score	Post				Relation			
		Pre Mean ± SD.	Immediately Mean ± SD.	1st month Mean ± SD.	2nd month Mean ± SD.	p1	p2	p3	p4
Hand washing	(0- 16)	11.02 ± 1.61	13.72 ± 1.46	12.16 ± 1.38	11.84 ± 1.25	<0.001*	0.001*	0.034*	<0.001*
Performing eye care	(0 -10)	5.60 ± 1.40	8.24 ± 1.15	7.40 ± 1.36	7.12 ± 1.27	<0.001*	<0.001*	<0.001*	<0.001*
Instilling eye drops	(0- 32)	17.90 ± 3.80	24.26 ± 3.01	22.88 ± 3.20	22.92 ± 2.57	<0.001*	<0.001*	<0.001*	<0.001*
Applying eye ointment	(0- 30)	18.46 ± 3.56	24.18 ± 2.82	22.68 ± 2.38	22.54 ± 2.09	<0.001*	<0.001*	<0.001*	<0.001*
Total mean score	(0- 88)	52.98 ± 8.35	70.40 ± 7.32	65.12 ± 7.27	64.42 ± 5.95	<0.001*	<0.001*	<0.001*	<0.001*

SD: Standard deviation.

P1: Relation between pre and immediate post P2: Relation between pre and 1st month post

P3: Relation between pre and 2st month post P4: Relation between pre and all (average) post. *: Statistically significant at p ≤ 0.05

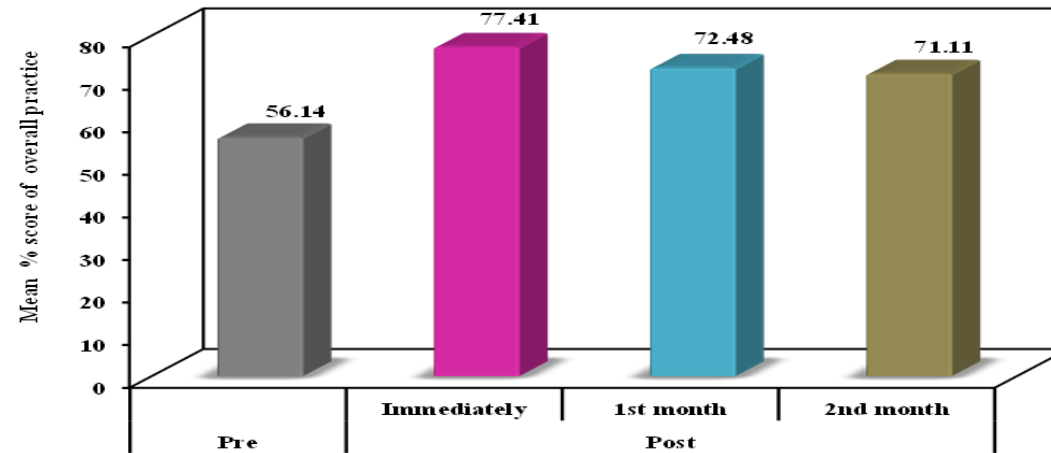


Figure (1): Mean % score of the studied patients according for both reporting and observational self-care practices checklist pre and post-educational strategies implementation (n = 50).

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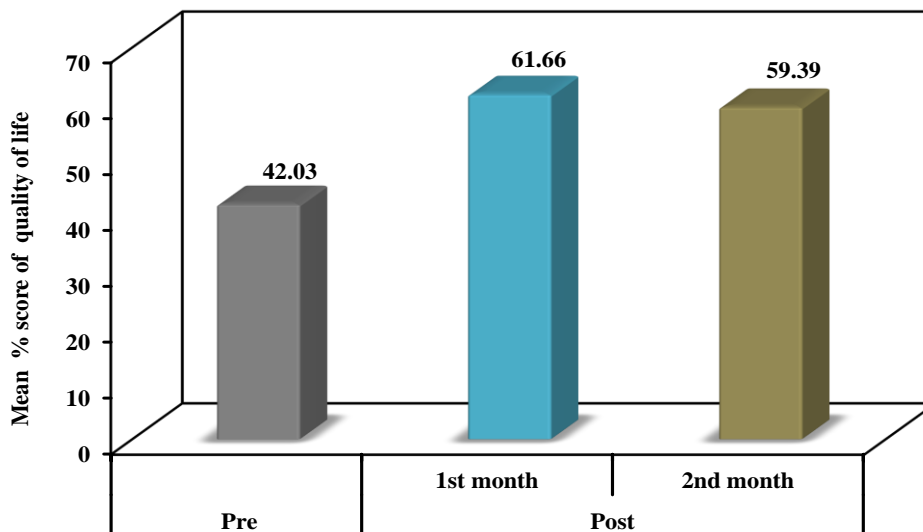


Figure (2): Mean % score according to their quality of life pre and post educational strategies implementation (n = 50).

Table (6): Correlation matrix among total knowledge, total self-care practices, and total QOL scores at the pre-post educational strategies implementation (n = 50).

	Pre		Post (average)	
	R	P	R	P
Knowledge VS. Practices	0.559*	<0.001*	0.781*	<0.001*
Knowledge VS. QOL	0.142	0.325	0.832*	<0.001*
Practices VS. QOL	0.095	0.511	0.756*	<0.001*

r: Pearson coefficient *: Statistically significant at $p \leq 0.05$

Discussion:

Diabetic retinopathy patients are at risk for developing visual impairment that negatively affects patients' functional status, daily living activities, and QOL. However, Vision-threatening diabetic retinopathy can be prevented by administering appropriate treatments to patients while also providing a well-structured educational program designed to enhance their adherence to self-care practices and improve their quality of life (Abid et al., 2022).

Regarding age, the current study reveals that above half of the DR patients were in the age group of forty to sixty years old with a mean age of 48.48 ± 7.49 years, from the researchers' perspective, this finding might

be due to DR is caused due to prolonged effect of diabetes mellitus that takes many of years to impact the patients' eyes. This result agrees with a study conducted by Saad & Elauoty, (2023), who studied about "Effect of prevention instructions regarding diabetic retinopathy on patients' knowledge, practices and attitude" they reported a comparable mean age of their studied sample, it was $49.21 + 9.75$.

Regarding gender, the current study found that four-fifths of the participants were female. The researchers suggests this may be because women are more susceptible to diabetes and its complications, such as diabetic retinopathy, due to factors like increased physical inactivity, higher stress

exposure, and greater family responsibilities. This finding aligns with a study by **Geethadevi et al. (2018)**, which reported that over two-thirds of participants at a primary health care center were female in contrast, **Najee & Shakir (2019)** discovered that the majority of patients in both the control and study groups were men when they conducted a study in an endocrine and diabetes center in Al-Nasiriya City.

In terms of educational level of the DR patients, the current investigation reveals that two-fifths of the patients under investigation lacked literacy, likely because many participants came from rural areas where illiteracy is prevalent. This is consistent with findings from **Memon et al. (2015)**, who reported that above half of the DR patients lived in a suburban area in Karachi were illiterate. However, this contrasts with **Salahen et al. (2020)**, who found that the highest percentage of the DR patients had a primary education.

Regarding the diabetes type, the current study finding indicates that above three-quarters of patients with diabetic retinopathy had type II diabetes mellitus. This result is matched with **Khalaf et al. (2019)**, who explored the effectiveness of educational intervention regarding diabetic retinopathy on the awareness of elderly patient with DR and reported that nearly two-thirds of participants had type II diabetes. In contrast, **Lima et al. (2016)** found that the heightened risk of diabetic retinopathy was linked to type I diabetes in their study on "Risk Factors for Diabetic Retinopathy."

Concerning comorbid conditions, the present study found that over half of the participants had hypertension, likely because hypertension is a significant risk factor for diabetic retinopathy. This finding is supported by **Said & Hamed (2021)** in their recent study on the impact of an education on diabetic patients' understanding of

diabetic retinopathy," which indicated that most patients had hypertension. Similarly, **Kashwa et al. (2021)**, conducted an epidemiological study about risk Factors of developing diabetic retinopathy," and reported that over sixty percent of the patients also had hypertension.

In terms of the diabetic retinopathy duration, the present study reveals that over half of the participants had been living with DR for less than five years. This aligns with findings from **Mostafa (2023)**, who also reported that above half of the patients had DR for under five years. However, this contrasts with the study by **Albaiuomy et al. (2019)**, who declared that over one-third of the patients with diabetes had DR for less than one year.

Regarding the primary complaint, the current study found that the most of the DR patients experienced blurred vision. This may be due to the retina's need for a constant blood supply, which is provided by a network of tiny vessels. In non-proliferative diabetic retinopathy (NPDR), these blood vessels become weakened, leading to tiny bulges that may leak fluid into the retina. This leakage can cause swelling of the macula, resulting in blurred vision (**American Optometric Association, 2024**). This finding is consistent with **Shaban (2018)** study, on diabetic retinopathy patients' self-care practice," which also mentioned that the majority of DR patients had impaired vision. However, it contrasts with the findings of **Aznan et al. (2018)** about factors associated with DR prevalence, in Primary Care Clinics," which found that most patients had good vision, with only a few experiencing visual impairment.

Regarding treatment for diabetic retinopathy, this study found that near seventy five percent of the DR patients received intravitreal medications. This is

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similar to the findings of **La Torre & Pacella (2017)** about Quality of Life among Patients with DR," where more than half of the patients were treated with intravitreal medications. However, this contrasts with the study by **Deswal et al. (2020)**, about the effect of DR on life Quality of Indian Diabetics," They reported that over one-third of the patients were treated with laser therapy. The variation in these findings could be attributed to several factors influencing the choice of treatment, such as the severity of DR.

Regarding the total mean knowledge score, the present study reveals highly statistically significant differences between patients' knowledge before and after the implementation of educational strategies. This improvement may be attributed to the use of diverse teaching methods such as lectures, discussions, colorful booklets, and data show presentations. This finding is consistent with **Mostafa (2023)**, They discovered no statistically significant differences in the research groups' and control groups' prior awareness of diabetic retinopathy. All knowledge items showed highly statistically significant differences between the two groups following the intervention.

The current study demonstrates highly statistically significant improvements in patient practices following the deployment of educational measures compared to previously, with regard to the total mean score of overall practice. This improvement may be attributed to regular follow-up by the researchers, who continuously corrected any missing or incorrect self-care practices. Additionally, patients were provided with instructional videos on their phones to ensure easy access to information and aid in memory retention. The researchers also

emphasized the importance of reinforcing self-care practices, which likely contributed to the observed improvements.

This finding aligns with the study by **Saad & Elauoty (2023)**, which demonstrated a highly statistically significant difference in the total practice mean scores before and after the implementation of preventive instructions. Most patients in their study exhibited competent practices following the intervention.

Regarding quality of life (QOL) score, the current study showed an improvement in overall QOL after the implementation of educational strategies compared to before. From the researchers' perspective, this reflects the usefulness of the educational strategies in enhancing the patients' overall quality of life. This result is matched with a study by **Mostafa (2022)**, which showed that patients in the study group had notably higher quality of life scores compared to those in the control group after the educational intervention that is sustained throughout the follow-up period.

Finally, regarding the correlation between patients' total knowledge, self-care practices, and overall quality of life (QOL) scores before and after the implementation of educational strategies, the present study found a positive correlation between total knowledge and practices. This indicates that as patients' knowledge increased, their self-care practices improved. This finding is corresponding with **Abid et al. (2022)**, who also identified statistically significant correlations between patients' total knowledge and self-care practices.

Conclusion:

The present study concluded that the patients with diabetic retinopathy showed a significant improvement in their knowledge

of diabetic retinopathy and self-care practices scores following the implementation of educational strategies. Similarly, this improvement was positively correlated with an enhancement in their quality of life after the educational strategies were applied. Furthermore, the study's findings confirmed the research hypotheses.

Recommendations:

The following recommendations are suggested based on the current study findings: Create a health education initiative for patients and their families to enhance self-care management, instructing patients on how to adopt healthy self-care practices related to diabetic retinopathy while avoiding detrimental behaviors. Furthermore, additional research should be carried out with a larger sample size to assess self-care practices and quality of life among diabetic retinopathy patients across different hospital environments.

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تأثير الاستراتيجيات التعليمية على ممارسة الرعاية الذاتية وجودة الحياة لمرضى اعتلال الشبكية السكري

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إحدى النتائج الشائعة والفريدة من نوعها للأوعية الدموية الدقيقة لمرض السكري هي اعتلال الشبكية السكري، والذي يتطور تدريجيًا مع مرور الوقت ويمكن أن يؤدي إلى فقدان الرؤية بشكل دائم. لذلك هدفت هذه الدراسة إلى تقييم تأثير الاستراتيجيات التعليمية على ممارسة الرعاية الذاتية وجودة الحياة لمرضى اعتلال الشبكية السكري. تم استخدام تصميم شبه تجريبي (اختبار قبل وبعد لمجموعة واحدة) لتحقيق هدف الدراسة في العيادات الخارجية لطب وجراحة العيون والعيادات الخارجية لمرضى السكر في مستشفى بنها الجامعي، في مدينة بنها، محافظة القليوبية، مصر، علي عينة غرضية مكونة من ٥٠ مريضًا مصابًا باعتلال الشبكية السكري. استخدمت الدراسة استبيان مقابلة منظمًا، وتقييم ممارسات الرعاية الذاتية لمرضى اعتلال الشبكية السكري، واستبيان جودة الحياة المرتبطة بوظيفة الرؤية. أظهرت النتائج ان هناك تحسن في المعرفة العامة وممارسات الرعاية الذاتية بعد تنفيذ الاستراتيجيات التعليمية، مع وجود علاقة إيجابية ذات دلالة عالية وإيجابية لجودة حياتهم الشاملة لذلك تم دعم فرضية الدراسة وتم تحقيق الهدف من الدراسة. واوصت الدراسة بإنشاء برنامج تعليمي لإرشاد مرضى اعتلال الشبكية السكري حول ممارسات الرعاية الذاتية الفعالة لتقليل المضاعفات.