

To Assess the Awareness of Diabetic Retinopathy among Diabetic Patients

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Abstract: ***Objectives:** To assess the awareness of diabetic retinopathy among diabetic patients. **Method:** The cross-sectional study was conducted at the Ophthalmology Department, K. J. Somaiya hospital, Sion, Mumbai, Maharashtra for duration of 2 years and comprised diabetic patients of either gender, aged 25-87 years. A pre-tested semi-structured questionnaire was used to collect data on socio-demographic, diabetes and diabetic retinopathy characteristics, sources of information, need for regular eye checkup. Data documented was analysed using Microsoft excel version 10. **Results:** Among 200 subjects, 104 (52%) were female, and 95 (were unaware that laser treatment halts progression but does not improve vision, 114 (57%) cited doctors as their primary information source, emphasizing the role of healthcare professionals. 47.5% were male, with a mean age of 57.33 years. Key findings included: 130 patients (65%) knew diabetes mellitus can affect the retina, 126 (63%) recognized that diabetic retinopathy can cause blindness, 115 (57.5%) understood that blood sugar control lowers retinopathy risk, 106 (53%) acknowledged the need for regular eye exams, 140 (70%) mistakenly believed vision loss from diabetic retinopathy is reversible, 162 (81%). **Conclusion:** The study identifies significant gaps in awareness of diabetic retinopathy and diabetes, especially concerning vision loss and laser treatment. Targeted educational interventions and accessible resources are essential for empowering patients to manage their eye health and improve outcomes in diabetic care.*

Keywords: Diabetic retinopathy, Awareness, Blindness

1. Introduction

Diabetic retinopathy constitutes 4.8% of the global causes for blindness^[1] with reported prevalence in India ranging from 7.3% to 25%.^[2] Diabetic retinopathy being a silent disease, early detection and timely intervention are important for its management.^[2] Over the years, it is not only a cause of demise but also a significant public health burden. 422 million people are suffering with diabetes worldwide, particularly in developing countries. Diabetes is currently one of the leading fourth leading cause of death in the world.^[3] Diabetes can be treated so that its consequences can be avoided or delayed with diet, physical activity and regular screening and treatment for the complications. Diabetic retinopathy is an important cause of blindness; it is because of long-term accumulated damage to the small blood vessels in the retina. 2.6% of global blindness is because of diabetes. The prevalence of diabetic retinopathy in India is between 7.3% - 25%. Diabetic retinopathy is asymptomatic in its early stages. Hence, regular screening of diabetic patients and periodic follow up remains the only option to detect and treat the condition before it causes visual loss.^[4]

Diabetes is a major non-communicable disorder and one of the leading long-term diseases globally. It is well established that individuals living with this chronic disorder can develop multiple complications, which are often life-threatening.^[5] DM can result in several complications such as diabetic retinopathy (DR) which is considered the most common microvascular complication of DM, neuropathy, neurologic, and cardiovascular complications.^[6] DR can affect 24% of diabetic patients who have had the disease for 10–15 years. It is estimated that globally around 35% of all diabetic patients develop some form of DR.^[7]

Numerous screening programs have been established throughout the world; these usually involve assessment and grading of the eyes of patients with diabetes, and referral of those with STDR to an ophthalmologist. A successfully implemented screening program should benefit patients by

increasing awareness of the importance of regular monitoring and providing a prompt referral to an ophthalmologist for screen-positive DR, to ultimately reduce the risk of sight loss and preserve patient function and quality of life^[8]

There is a requirement of a high level of awareness about diabetic retinopathy in the community to provide education to the diabetic patients about the risk factors for diabetic retinopathy and also regarding its sight threatening complications. Thus a main challenge to the health care providers in India is to spread awareness and knowledge about diabetic retinopathy and thus reduce the social burden of the disease.^[9]

The occurrence of this disease might lead to the worst-case prognosis of severe vision loss or blindness. Thus, educating diabetic patients about retinopathy is crucial, as these populations are at high risk of developing them. However, to our best knowledge, the level of awareness of retinopathy among diabetic subjects is still limited worldwide. Moreover, among the developed countries, a lot of studies have been performed to evaluate this issue. Sadly, our country's diabetic population lacks awareness and understanding of the condition. This study is related to identifying the awareness of diabetic retinopathy, which enhances the understanding related to it. This research study serves as a baseline assessment of the awareness and relationship between demographic factors among the diabetic population for future research or program planning. Thorough understanding of this issue will motivate the development of a corresponding program to educate the diabetic population.

Aims:

- 1) To assess the level of awareness about diabetic retinopathy among individuals with diabetes mellitus
- 2) To identify gaps in knowledge regarding the risk factors, symptoms, and complications of diabetic retinopathy

Objectives:

- 1) Evaluate participants' understanding of the relationship between diabetes and retinopathy

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- 2) Determine the proportion of diabetic patients who are aware of the need for regular eye examinations
- 3) Assess knowledge of early symptoms and warning signs of diabetic retinopathy
- 4) Identify demographic factors associated with higher or lower levels of awareness
- 5) Explore participants' awareness of available treatment options for diabetic retinopathy
- 6) Investigate the sources of information about diabetic retinopathy among the study population
- 7) Determine the frequency of eye examinations among diabetic patients
- 8) Assess participants' understanding of preventive measures for diabetic retinopathy
- 9) Evaluate the impact of diabetes duration on awareness levels
- 10) Identify barriers to seeking regular eye care among diabetic patient

2. Material and methodology

- 1) Study site: Department of ophthalmology, K. J. Somaiya medical college and research centre, Mumbai
- 2) Study population: Random patients who came for routine eye checkup or with some complaints having diabetes mellitus both recently diagnosed as well as on treatment without any age group limitations.
- 3) Study design: Cross sectional statistical study
- 4) Period of study: Approximately 2 years
- 5) Study sample size: 200 patients
- 6) Data collection:

Inclusion criteria:

- Patients with diabetes mellitus both recently diagnosed as well as on treatment.
- Patient with normal as well as uncontrolled blood sugar levels.
- Patient already diagnosed with diabetic retinopathy.

Exclusion criteria:

- Non-compliant patients to regular follow up
- Patients who are not on regular treatment.

- 7) Data analysis: The data was collected through a survey of the patients entering ophthalmic OPD. Responses were recorded and automatically spread sheet was prepared. Categorical data was summarized with

frequency count and percentage. Appropriate graphs and pie charts were used to represent the data. Analysis was done using Microsoft excel version 10.

3. Results

The study comprised 200 participants, aged between 25 and 87 years, with a mean age of 57.33 ± 11.11 years. This indicates a diverse age range, spanning from middle-aged to older adults, within the sample.

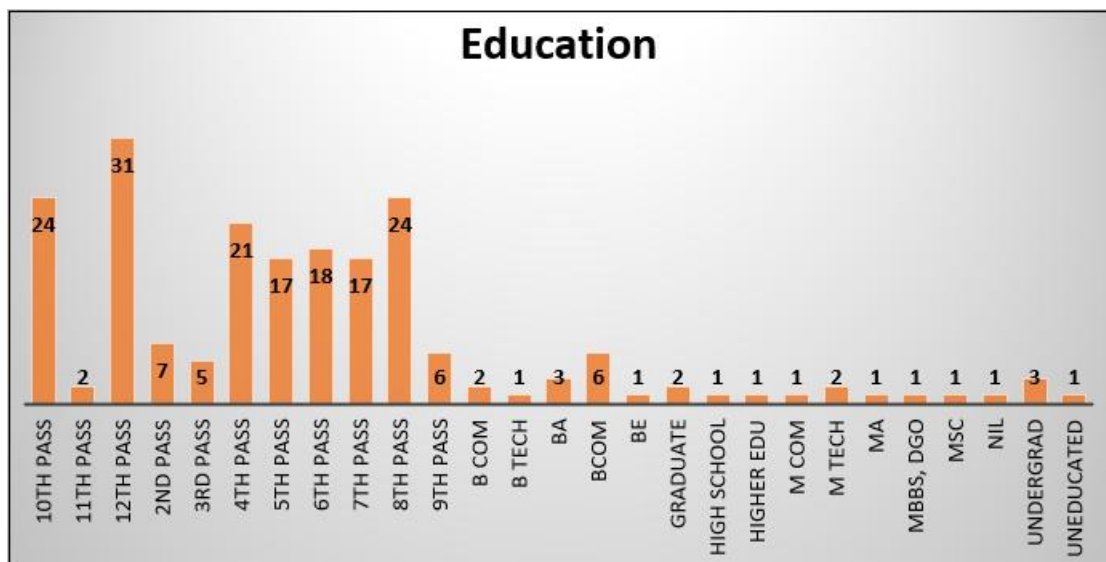
Table 1

Age Distribution					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	200	25.00	87.00	57.33	11.11

The gender distribution among the participants revealed that out of the total 200 individuals, 104 were female, representing 52.0% of the sample, while 95 were male, constituting 47.5% of the cohort. Additionally, one participant identified as transgender, accounting for 0.5% of the total sample. This indicates a relatively balanced representation of genders within the study population, with a slight majority of females.

The occupation distribution among the participants in the study is diverse, covering a wide range of professions. Among the 200 individuals surveyed, occupations varied considerably, with each category contributing to the overall demographic representation. Notably, the majority of participants were housewives, accounting for 44.5% of the sample. Other occupations included drivers (6.5%), retired individuals (13.0%), and salesmen (2.5%). Various professions were represented by smaller percentages, such as farmers (2.0%), doctors (1.5%), and teachers (1.5%). Even less common occupations, like bakers (0.5%), goldsmiths (0.5%), and watchmen (0.5%), were included in the study, illustrating the comprehensive nature of the occupational distribution within the sample.

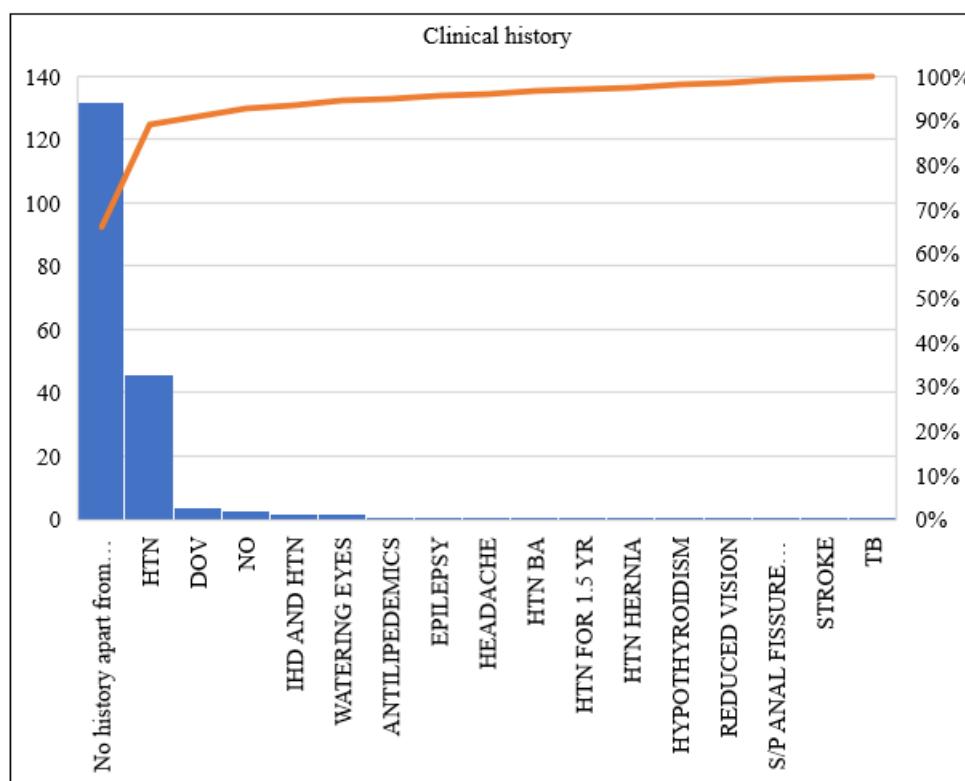
The education level of the participants in the study demonstrates a varied distribution, reflecting diverse educational backgrounds within the sample. Among the 200 individuals surveyed, educational attainment ranged across multiple categories. This comprehensive breakdown underscores the diverse educational backgrounds represented within the study population.



Graph 1: Bar graph showing Distribution of subjects depending upon their education

The clinical history of 200 patients, all diagnosed with diabetes mellitus (DM), was assessed to understand their systemic and clinical backgrounds. Among the recorded conditions, hypertension (HTN) emerged as the most prevalent, with 46 patients (23%) reporting its presence. Other notable conditions included ischemic heart disease

(IHD) and HTN, observed in 2 patients (1%), and hypothyroidism, epilepsy, headache, and tuberculosis (TB), each reported by 1 patient (0.5%). Additionally, 1 patient (0.5%) had a history of antilipidemic, while another reported an anal fissure in 2012. Notably, 132 patients (66%) indicated no other medical history apart from DM.



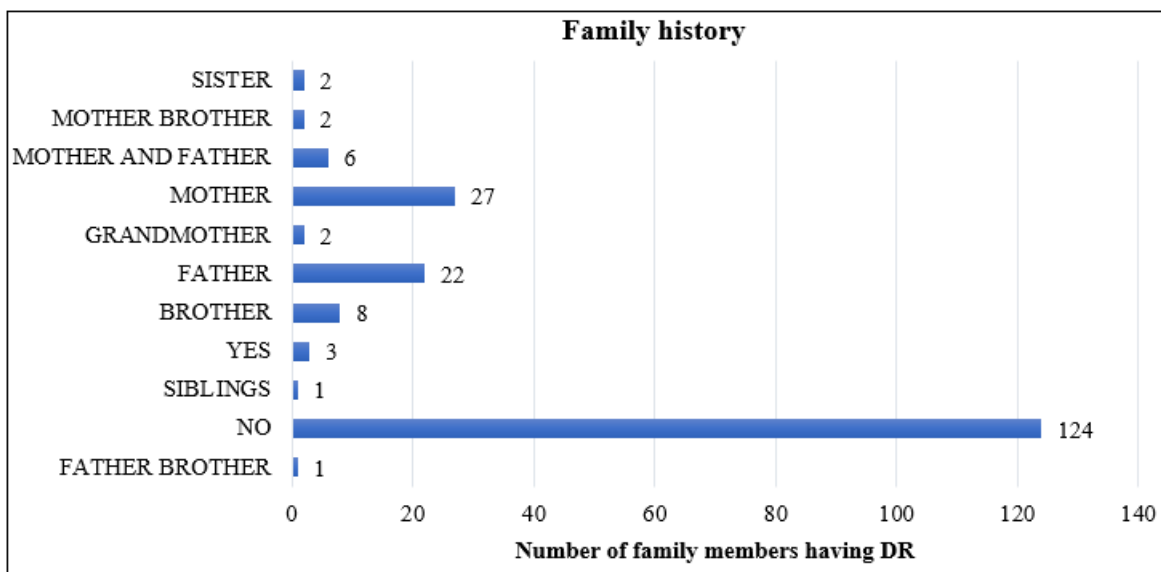
Graph 2: Histogram shows the subjects having clinical history

The duration of diabetes mellitus (DM) among the 200 patients attending the ophthalmology outpatient department varied widely, reflecting diverse experiences in managing the condition. The data revealed durations spanning from very recent diagnoses to longstanding cases. Notably, three patients (1.5%) reported being diagnosed just one month ago, while 13 patients (6.5%) had been managing their diabetes for one year. Furthermore, 10 patients (5%) reported a duration of two years, with two patients (1%) specifying 2.5 years. The

prevalence of diabetes for three years was reported by 12 patients (6%), while durations of four years and five years were reported by 12 patients (6%) and 17 patients (8.5%) respectively. Two patients (1%) indicated a duration of six years, while 14 patients (7%) reported managing diabetes for seven years. Additionally, durations of eight years and nine years were reported by six patients (3%) and three patients (1.5%) respectively. Other durations included 10-12 years (1 patient, 0.5%), 15 days (1 patient, 0.5%), 17 years (2 patients,

1%), 18 years (2 patients, 1%), 20 years (8 patients, 4%), 21 years (1 patient, 0.5%), 22 years (1 patient, 0.5%), 25 to 30 years (1 patient, 0.5%), 27 years (1 patient, 0.5%), and 28 years (1 patient, 0.5%).

The family history of respondents regarding diabetic retinopathy revealed a spectrum of familial connections to the condition. This comprehensive assessment of familial history provides insights into the genetic predisposition and familial patterns associated with diabetic retinopathy among the respondents.



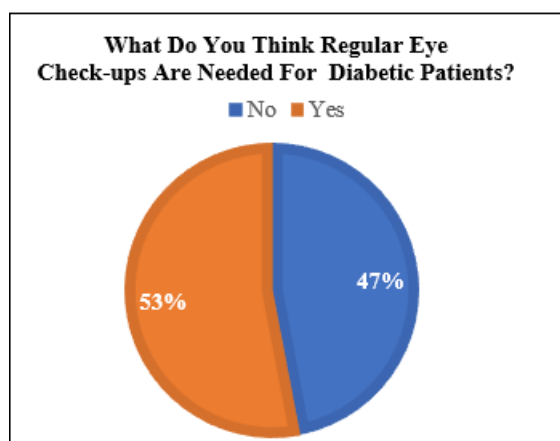
Graph 3: Bar chart shows the subjects having Family history

Indeed, diabetes mellitus (DM) can profoundly impact the retina, leading to a condition known as diabetic retinopathy (DR). Among the 200 patients surveyed, 130 individuals (65%) affirmed that DM can affect the retina, acknowledging the link between diabetes and retinal complications. This recognition highlights the awareness among a significant portion of the respondents regarding the ocular consequences of diabetes. However, it's notable that 70 patients (35%) did not acknowledge this association, indicating a potential gap in understanding or awareness among a portion of the surveyed population regarding the ocular manifestations of diabetes mellitus.

The potential for diabetic retinopathy (DR) to progress to blindness is a critical concern. Among the 200 respondents, 126 individuals (63%) acknowledged that diabetic retinopathy can indeed lead to blindness, indicating a significant awareness of the sight-threatening implications of this condition. However, it's concerning that 74 respondents (37%) answered negatively, suggesting a potential lack of awareness or understanding regarding the severity of diabetic retinopathy and its implications for vision health.

Controlling blood sugar levels plays a crucial role in reducing the risk of diabetic retinopathy (DR), a fact that seems to be recognized by the majority of respondents. Among the 200 individuals surveyed, 115 (57.5%) acknowledged that maintaining blood sugar control can indeed lower the risk of developing diabetic retinopathy. However, it's noteworthy that 85 respondents (42.5%) answered negatively. This underscores the importance of emphasizing the significance of glycemic control as a preventive measure against diabetic retinopathy during patient education and awareness initiatives.

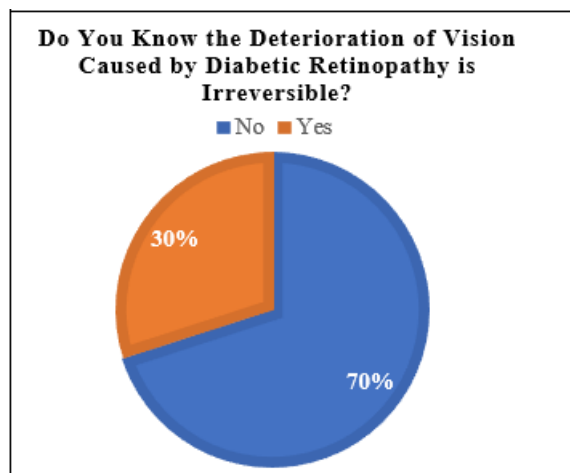
Regular eye check-ups are essential for diabetic patients to monitor their ocular health and detect any signs of diabetic retinopathy (DR) early. Out of the 200 respondents, 106 individuals (53.0%) recognized the importance of regular eye examinations for diabetic patients. This acknowledgment reflects an understanding of the need for proactive eye care to prevent vision-threatening complications associated with diabetes. However, it's noteworthy that 94 respondents (47.0%) indicated otherwise, suggesting a potential lack of awareness regarding the necessity of routine eye screenings for diabetic individuals. This highlights the importance of patient education on the significance of regular eye check-ups in managing diabetic eye disease effectively.



Graph 4: Pie chart shows the subject's response regarding regular eye check-ups essential for diabetic patients or not.

The understanding of whether the deterioration of vision caused by Diabetic Retinopathy is reversible or irreversible varied among respondents in our survey. Out of 200 participants, 140 individuals (70.0%) believed that the vision

deterioration associated with Diabetic Retinopathy is reversible. Conversely, 60 respondents (30.0%) expressed the belief that such deterioration is irreversible.



Graph 5: Pie chart shows the subject's response regarding whether the deterioration of vision caused by Diabetic Retinopathy is reversible or irreversible.

Among the respondents in our survey, 162 individuals (81.0%) were not aware that laser treatment for Diabetic Retinopathy does not lead to vision improvement but rather serves to halt further progression of Retinopathy and prevent vision deterioration. Conversely, 38 participants (19.0%) indicated awareness of this aspect of treatment. These findings underscore the importance of patient education regarding the objectives and outcomes of laser treatment in managing Diabetic Retinopathy, emphasizing the role of healthcare professionals in providing accurate information to diabetic patients to facilitate informed decision-making regarding their ocular health management.

The sources of information about Diabetic Retinopathy and Diabetes Mellitus reported by respondents varied widely, reflecting diverse avenues through which individuals acquire knowledge about these conditions. Among the respondents, 114 individuals (57.0%) cited doctors as their primary source of information, highlighting the pivotal role of healthcare professionals in educating patients about these conditions. Some respondents mentioned obtaining information from multiple sources, such as doctors and screening camps (2 individuals, 1.0%), doctors and friends (12 individuals, 6.0%), and doctors, friends, and hospitals (1 individual, 0.5%). Others relied solely on friends (11 individuals, 5.5%), hospitals (5 individuals, 2.5%), newspapers (1 individual, 0.5%), or self-research (2 individuals, 1.0%) for information. Additionally, a few respondents mentioned unconventional sources like social media (1 individual, 0.5%) and television (1 individual, 0.5%) as their sources of information. The wide range of sources underscores the importance of disseminating accurate and comprehensive information about Diabetic Retinopathy and Diabetes Mellitus through various channels to ensure widespread awareness and understanding among the public.

4. Conclusion

In conclusion, the study highlights both promising trends and concerning gaps in the understanding and awareness of

diabetic retinopathy (DR) and diabetes mellitus (DM) among the surveyed population. While a significant proportion of participants demonstrated awareness of key issues such as the link between DM and retinal complications, as well as the importance of blood sugar control and regular eye check-ups, there remains a substantial segment of the population with incomplete knowledge.

Of particular concern is the lack of awareness regarding the irreversible nature of vision deterioration caused by DR and the misconception that laser treatment improves vision rather than halting further progression of the condition. These findings underscore the critical need for targeted educational interventions aimed at dispelling misconceptions and promoting accurate understanding of the management and prognosis of DR and DM.

Moreover, the diverse sources of information cited by participants highlight the importance of comprehensive and accessible educational resources across various platforms, with healthcare professionals playing a central role in disseminating accurate information. Strengthening patient education efforts can empower individuals to take proactive steps in managing their diabetic eye health, ultimately reducing the risk of vision loss and improving overall quality of life.

In essence, bridging the identified knowledge gaps through tailored educational initiatives holds the potential to enhance patient outcomes, mitigate the burden of diabetic eye disease, and promote a proactive approach to diabetic care within the community.

5. Discussion

The discussion of the study's findings delves into the implications of the observed trends and explores potential avenues for addressing the identified gaps in knowledge and awareness regarding diabetic retinopathy (DR) and diabetes mellitus (DM).

Firstly, the study revealed a varied understanding among participants regarding the link between DM and retinal complications, as well as the significance of glycemic control and regular eye check-ups in preventing diabetic eye disease. While a substantial portion of the surveyed population demonstrated awareness of these key concepts, a concerning number of respondents displayed misconceptions, particularly regarding the irreversible nature of vision deterioration caused by DR and the role of laser treatment in managing the condition.

This discrepancy in knowledge underscores the importance of targeted patient education initiatives aimed at enhancing understanding and dispelling myths surrounding DR and DM. Healthcare providers play a pivotal role in this regard, serving as trusted sources of information and guidance for patients. By incorporating comprehensive and accessible educational resources into clinical practice, healthcare professionals can empower individuals to make informed decisions about their diabetic eye health and adopt proactive measures to mitigate the risk of vision loss.

Furthermore, the diverse sources of information cited by participants highlight the need for a multifaceted approach to disseminating accurate information about DR and DM. While doctors emerged as the primary source of information, other channels such as friends, family, social media, and traditional media were also mentioned. Leveraging these various platforms to deliver consistent and evidence-based messaging can broaden the reach of educational initiatives and reinforce key concepts across different segments of the population.

Moreover, the study underscores the importance of individualized care plans tailored to patients' needs and risk factors. The variability in perceptions regarding the frequency of eye check-ups among diabetic patients highlights the need for personalized approaches to diabetic eye care, taking into account factors such as disease severity, comorbidities, and patient preferences.

In conclusion, the findings of the study underscore the critical role of patient education in promoting early detection, effective management, and prevention of vision-threatening complications associated with DR and DM. By addressing knowledge gaps and misconceptions through targeted educational interventions, healthcare providers can empower individuals to take proactive steps in safeguarding their vision and enhancing their overall quality of life in the face of diabetic eye disease.

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