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**Original Research Article**

# Understanding the knowledge about diabetic and its effect on eye among patients visiting a multi-specialty hospital: a cross-sectional study

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## ABSTRACT

**Background:** The objective of this study was to access the knowledge about diabetic and its effect on eye.
**Methods:** A cross-sectional study was conducted among 352 patients visiting a multi-specialty hospital of Moradabad, Uttar Pradesh. The study was conducted among the age group 29 to 80 years. A pre validated questionnaire was used to collect the responses about knowledge on diabetic and its effect on eye.
**Results:** The study included a sample of 352 individuals aged between 29 and 80 years, with a mean age of 53.7 years. The gender distribution was fairly balanced, with 53.7% females and 46.3% males. Most participants resided in urban areas (60.8%), while the remaining 39.2% were from rural localities. Out of the 352 individuals surveyed, 282 participants, accounting for 80.1% of the total, indicated that they had heard of diabetic retinopathy. Out of the 352 individuals surveyed, 236 provided valid responses on asking diabetes affect eyes.
**Conclusions:** Despite of good knowledge of participants about diabetic, eye health care providers must prioritize comprehensive education about the ocular complications of diabetes during routine consultations. Such interventions are crucial for early detection and management of diabetic eye diseases, which can significantly reduce the risk of vision loss and improve the quality of life for these patients.

**Keywords:** Diabetic, Effect, Eye, Knowledge

## INTRODUCTION

Diabetes has been identified as a significant health crisis in the 21st century, with the global diabetic population projected to rise from 415 million in 2015 to 642 million by 2040.[1,2] Diabetic retinopathy, contributing to 4.8% of worldwide blindness cases, poses a substantial concern.[3] It is a leading cause of new-onset blindness in industrialized nations' working-age populations and an increasingly prevalent cause in middle-income countries.

Diabetes mellitus, particularly type II, represents a significant global public health challenge.[4] According to the World Health Organization (WHO), there is a projected substantial increase in the prevalence of type II diabetes mellitus across both developed and developing nations over the next two decades. In developed regions, estimates indicate a rise of approximately 46%, from 55 million in 2000 to 83 million in 2030. Conversely, among developing countries, the anticipated surge is around 150%, from 30 million in 2000 to 80 million in 2030.[4]

Studies such as the Wisconsin epidemiological study have demonstrated a correlation between the duration of diabetes and the occurrence of microvascular complications, such as diabetic retinopathy (DR).[5] While the onset of DR may not be preventable, measures can be taken to mitigate its sight-threatening implications. Previous research indicates that a significant portion (63%) of the rural diabetic population has not undergone eye examinations.[6] Additionally, there is a notable lack of response to invitations for DR screening, as evidenced by

the low attendance rate (11.6%) at screening camps following diabetes detection events.[7]

Moreover, Dandona et al observed a limited awareness (28.8%) of DR among the urban general population in India, with greater awareness noted among individuals of higher socio-economic status.[8]

Observations at our tertiary eye care center in south India reveal a concerning trend: many diabetic patients present with advanced retinopathy, lacking proper screening, treatment, or follow-up as per recommended guidelines. This neglect results in preventable visual impairment. Similar concerns have been voiced globally, highlighting gaps in disease knowledge and suboptimal screening methodologies.[9-11]

## METHODS

This cross-sectional study was conducted in Moradabad, Uttar Pradesh between October 2023 to January 2024. This study aimed to assess knowledge and attitude regarding diabetic retinopathy among diabetic patients in Moradabad, Uttar Pradesh. The study was conducted on 352 individuals aged between 29 and 80 years. The inclusion criteria were diabetic patients and non-diabetic patients of rural and urban area of Moradabad, Uttar Pradesh. The convenient sampling was carried for the study. A pre validated questionnaire was used to collect data. The questionnaire was presented in English and Hindi language to make it suitable for patients to understand. The questionnaire contained the following two sections: the participant's demographic data and knowledge about diabetic and its effect on eye. The date was collected from the patients who have visited the Internal medicine OPD at Teerthanker Mahaveer University Hospital by presenting the questionnaire to the patients who has satisfied the inclusion criteria. The data were analyzed using SPSS software. Descriptive analysis was performed based on the frequencies and percentages calculated for categorical variables. Informed consent was obtained from the participants before filling out the questionnaire. The study was conducted after obtaining approval from institutional ethical committee.

## RESULTS

The study included a sample of 352 individuals aged between 29 and 80 years, with a mean age of 53.7 years (Table 1). The gender distribution was fairly balanced, with 53.7% females and 46.3% males. Most participants resided in urban areas (60.8%), while the remaining 39.2% were from rural localities. The predominant religion was Hinduism (55.4%), followed by Islam (44.3%), with a negligible percentage belonging to other religions.

Education levels varied significantly, with 45.2% having no formal education and only 8.8% having completed post-graduate studies or higher. A considerable proportion of the sample were engaged in home duties (52.6%), followed by those in service jobs (17.9%), and the rest distributed among business persons, unemployed, and other occupations.

### *Responses on knowledge*

Among respondents, the question "is diabetes hereditary?" yielded insightful results. Out of the 352 total participants, 231 responded to this question, while 121 did not answer as they were not knowledgeable about diabetes. Of the valid responses, 64 individuals (27.7%) indicated that they did not know whether diabetes is hereditary. A smaller portion, 32 respondents (13.9%), believed that diabetes is not hereditary. The majority, comprising 135 participants (58.4%), affirmed that diabetes is hereditary. This indicates a significant awareness among diabetic patients regarding the hereditary nature of diabetes, although there is still a considerable percentage that either lacks knowledge or holds incorrect beliefs about the condition's hereditary aspects.

The responses to the question "have you heard of diabetic retinopathy?" reveal a significant gap in awareness among the participants. Out of the 352 individuals surveyed, 282 participants, accounting for 80.1% of the total, indicated that they had heard of diabetic retinopathy. Conversely, only 70 respondents, or 19.9%, were not aware of the condition. This data suggests that the majority of the population sampled good knowledge about diabetic retinopathy, a serious complication of diabetes that can lead to vision loss if left untreated.

The question "can diabetes affect eyes?" was posed to the participants, yielding insightful results. Out of the 352 individuals surveyed, 236 provided valid responses. Among these respondents, 167 individuals, representing 70.8% of the valid responses, acknowledged that diabetes can indeed affect the eyes. On the other hand, 69 participants, accounting for 29.2% of the valid responses, indicated that they did not know about this potential complication of diabetes. Notably, there were 116 participants who did not answer the question, as they did not have knowledge about diabetes in general. These findings highlight a relatively good awareness among the surveyed population about the ocular complications of diabetes, yet there remains a substantial proportion (29.2%) who are unaware of this crucial information. This indicates a need for ongoing education and knowledge to ensure that all individuals with diabetes are fully informed about the risks to their eye health.

The survey question "is it important for a person with diabetes to control blood pressure?" was directed at participants knowledgeable about diabetes, yielding 68 valid responses. The results indicated that the majority, 54 respondents (79.4%), affirmed the importance of blood pressure control for diabetics. A small number, 13 respondents (19.1%), were uncertain, and only 1

respondent (1.5%) believed that blood pressure control was not important. These findings highlight knowledgeable participants about the significance of controlling blood pressure in diabetic individuals. However, the presence of some uncertainty suggests a need for continued education on the critical role of blood pressure management in preventing complications associated with diabetes as shown in Table 1.

**Table 1: Knowledge about diabetes and eye.**

| Awareness and knowledge | Frequency | Valid percent |
|---|---|---|
| **Knowledge about diabetes** | | |
| Yes | 236 | 67 |
| No | 116 | 33 |
| **Is diabetes hereditary?** | | |
| Yesz | 135 | 58.4 |
| No | 32 | 13.9 |
| Don't know | 64 | 27.7 |
| Don't know | 29 | 25 |
| **Have heard of diabetic retinopathy** | | |
| Yes | 282 | 80.1 |
| No | 70 | 19.9 |
| **Can diabetes affect eyes?** | | |
| Yes | 236 | 67 |
| No | 116 | 33 |
| **Is it important for a person with diabetes to control blood pressure?** | | |
| Yes | 279 | 79.26 |
| No | 73 | 20.73 |

## DISCUSSION

Diabetes is becoming a greater global burden.[12] As a result, an increase in the prevalence of diabetic retinopathy is also anticipated. Effective screenings can lower this risk. And strict blood sugar management.[13] The community's ignorance of diabetes and diabetic retinopathy has a significant influence on the quality of care provided.

While comparing the knowledge regarding diabetic retinopathy with the study conducted by Al-Yahya et al.[14] It has been found that the median knowledge score for diabetes was good. And the similar finding has been reported in our study. Similarly, while comparing the about diabetes check his/her blood sugar, in our study we have found that 67.04% has reported valid respond while the study conducted in Turkey by 41.9% stated that annual examination was necessary which is statically lesser response than our study.[15]

Also, In an Ethiopian study of diabetes patients, 47.4% of the participants reported having good awareness of DR and in a similar study conducted in India, 47% of the participants reported having good understanding of DR.[16,17] Studies conducted in Bangladesh and Saudi Arabia on the other hand, revealed higher values (64% and 76%, respectively).[18,19]

Further while collecting the response from patient about diabetic can affect the eye, we have found that again 67.04% participants has reported the valid response while the study conducted in the Middle Eastern region were conducted in Jordan and Oman which revealed that 88.2% and 72% has reported that DM can affect the eye respectively.[20,21] Similarly the study conducted by Owusu-Afriyie et al has reported that 71.4% were aware that diabetes can have an impact on the eyes which is having a bit greater knowledge comparing to our study, the reason could be we have consider the population from rural area too.[22]

Further while collecting the response on DR, it important for a person with diabetes to control blood pressure we have found that 79.4% has reported the valid response while comparing with the study conducted by Klein et al, it has been suggested that elevated blood pressure damages the retinal capillary endothelial cells in diabetics' eyes through the effects of increased blood flow.[23]

## CONCLUSION

This cross-sectional study highlights the critical link between knowledge about diabetes and its impact on ocular health. Our results show that diabetes individuals have an excellent understanding of the possible ocular problems that could arise from their disease. Although there is ample evidence linking diabetes to eye conditions such diabetic retinopathy and other ocular complications, a significant segment of the research population lacked knowledge or possessed insufficient understanding of these risks.

During routine consultations, eye health care providers should make it a priority to provide thorough information regarding the ocular consequences of diabetes. These therapies are essential for the early diagnosis and treatment of diabetic ocular disorders, which can greatly lower the chance of vision loss and enhance the patients' quality of life.

Additionally, rapid diagnosis and treatment of diabetic eye diseases depend on routine eye exams. Public health campaigns and policy modifications are desperately needed to encourage routine eye exams and to lower the cost and increase the accessibility of these treatments for people with diabetes. Additionally, spreading awareness through the encouragement of routine eye exams is crucial to lowering the risk of diabetic vision loss.

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