

## Original Research Article

# Awareness on diabetes and its ocular complications among first year medical undergraduates

Lydia Charles, Vinisha Kumaresan\*, Sanjeev Kumar Puri

Department of Ophthalmology, Saveetha Medical College and Hospital, Chennai, Tamil Nadu, India

**Received:** 09 November 2022

**Accepted:** 24 November 2022

### \*Correspondence:

Dr. Vinisha Kumaresan,

E-mail: [vinisha3004@gmail.com](mailto:vinisha3004@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** Diabetes mellitus has nowadays become a world-wide health problem. The aim of this study is to bring awareness among medical students on ocular complications caused due to diabetes mellitus.

**Methods:** A questionnaire-based, cross-sectional study was conducted among 250 first year medical undergraduate students. A simple and easily understandable questionnaire was drafted and validated. This questionnaire tested their knowledge about diabetes and its ocular complications.

**Results:** Out of 250 students, 210 have participated in the study. Out of 210 students, 40.48% (85/210) have heard about diabetes mellitus but they did not know that it can affect the eye and can lead to blindness. 42.86% (90/210) were aware about the disease, its potential to cause vision threatening complications and ways to prevent these complications. 16.67% (35/210) were not aware about diabetes mellitus.

**Conclusions:** The awareness about diabetes mellitus is high among students. But awareness on ocular complications due to diabetes is very low in students. So, it is necessary to educate every single student about the complications of diabetes and how it affects the eye. It is important to implement and conduct awareness programs to increase awareness among students. It is important to educate the students on periodic eye check-up to prevent complications.

**Keywords:** Medical students, Awareness of diabetes, Effect on eye

## INTRODUCTION

Diabetes is a condition that impairs the body's ability to process glucose. It causes an increase in blood sugar level. Higher blood sugar level in body leads to ocular complications. Complications of diabetes are progressive resulting by chronic exposure to high blood levels of glucose which is caused by defect in insulin metabolism and various biological macromolecules which include carbohydrates, lipids, proteins and nucleic acids.<sup>1</sup> ocular complications caused by diabetes include diabetic retinopathy, diabetic macular oedema, cataract and glaucoma. Ocular -related symptoms of DM may also include blurred and fluctuating vision, night blindness as well as flashes and floaters. Diabetes is one of the important causes of blindness in adults. Tight control of blood glucose and blood pressure has been demonstrated

to reduce the risk of retinopathy and associated blindness.<sup>2</sup> People suffering with diabetes develop impaired vision but fewer than 5% suffer severe vision loss. Reduction in visual acuity which is seen in people with diabetes is mostly due to cataract, which is particularly shown by clinical epidemiological studies.<sup>3</sup> The objective of the study is to bring awareness on ocular complications caused due to diabetes. This study is done to assess and to bring awareness on diabetes and its ocular complications in first year medical undergraduates.

## METHODS

### Study type

This is a questionnaire-based cross-sectional study.

### Study place

Study conducted at Saveetha medical college and hospital, Thandalam, Chennai

### Study period

Study carried out from February 2021 to August 2021.

### Sampling method

Method used was convenience sampling method.

Study conducted among 1<sup>st</sup> year medical undergraduate students who were willing to participate. It is a questionnaire-based study where the questions drafted in such a way that it was simple and easy to understand. Majority of questions closed ended questions which required a yes/ no for an answer (Appendix). Questionnaire validated before being used in the study. All students given questionnaire and asked to record their responses. These questions tested the awareness about diabetes mellitus and also about the potential ocular complications of disease. Students not willing to participate excluded. Microsoft excel 2019 used to analyze data and results were expressed as percentages.

### Ethical approval

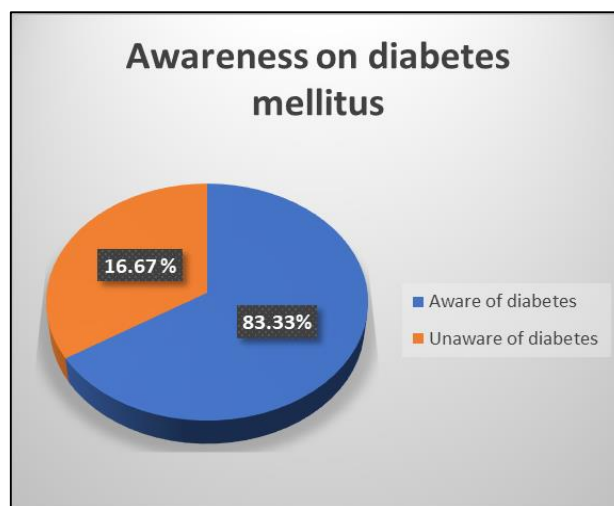
This study was approved by the ethics committee of Saveetha medical college and hospital. As this study was a cross-sectional study, no participants' private data such as name, telephone number and address were involved. Only demographic information and participants' knowledge related to diabetes mellitus and its ocular complication were collected and analyzed in this study.

## RESULTS

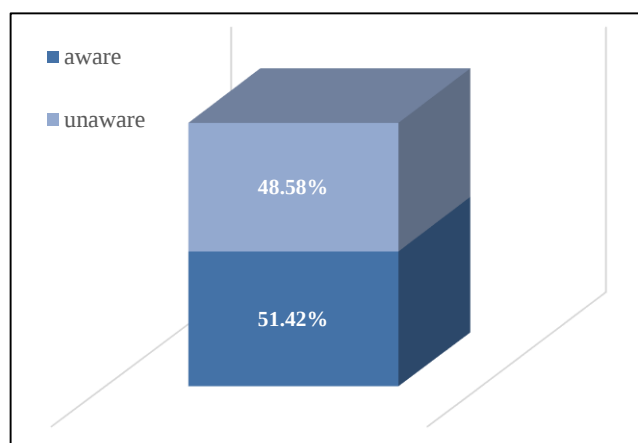
Out of 250 students, 210 have participated in the study. Among them, 47.62% (100/210) were boys and 52.38% (110/210) were girls. The range of age was from 18 to 20 years. Most of the students (50.47%) were 18 years old (Table 1). Out of 210 students, 40.48% (85/210) have heard about diabetes mellitus but they did not know that it can affect the eye and can lead to blindness. 42.86% (90/210) were aware about the disease, its potential to cause vision threatening complications and ways to prevent these complications. 16.67% (35/210) were not aware about diabetes mellitus (Figure 1). Overall, only 42.86% had some basic knowledge about diabetes and its complications (Figure 2).

**Table 1: Age distribution.**

| Age (years)  | Male | Female |
|--------------|------|--------|
| 18           | 50   | 56     |
| 19           | 45   | 51     |
| 20           | 5    | 3      |
| <b>Total</b> | 100  | 110    |



**Figure 1: Awareness of diabetes mellitus among first year medical undergraduate students.**



**Figure 2: Awareness on the ocular complications of diabetes mellitus among the students who were aware of the disease.**

## DISCUSSION

The 422 million people worldwide are affected by diabetes worldwide particularly people living in low- and middle-income countries. Diabetes is very common and increasing in India very rapidly. Approximately more than 60 million people in India are recently diagnosed with diabetes. Changes in diet, physical activity, pharmacological treatment can prevent and reduce prevalence of diabetes.<sup>4,5</sup> It is believed that improved survival contributes to increase in prevalence of diabetes in future in developed countries.<sup>6</sup> Prevalence of diabetes is abruptly increasing in young population in the recent times. 4<sup>th</sup> leading causes of avoidable blindness is considered as diabetic retinopathy and it accounts 5% of blindness throughout the world approximately.<sup>7</sup> Diabetic retinopathy occurs by poorly controlled blood sugar. This is common in both type I and type II diabetes. In microvascular complications of diabetes, diabetic retinopathy (DR) is considered as the

most common leading cause of blindness.<sup>8</sup> Diabetic retinopathy can cause blindness if left undiagnosed and untreated. Individuals with type 1 diabetes and people more than 70% having type 2 diabetes of 20 years duration have high chances of developing retinopathy.<sup>9</sup> Periodic and regular check-up by ophthalmologist is very important to prevent blindness due to diabetic retinopathy. Diabetic retinopathy is a disease that affects 4.2 million people worldwide, making it a leading cause of blindness.<sup>10</sup> Many people are prone to diabetic retinopathy due to lack of knowledge and awareness on diabetes and its ocular complications and lack of periodic eye check-up.

In our study, we conducted a survey among the students to find out their level of awareness of diabetes mellitus and its ocular complications in undergraduate medical students. More than 80% are aware on what is diabetes mellitus. Only 40% are aware that diabetes affects the eye and causes ocular complications.

It is clearly evident that from this study the level of awareness on ocular complications due to diabetes mellitus is comparatively low among students.

Therefore, it is important to provide awareness about diabetes and provide some basic knowledge about the complications especially vision threatening diabetic retinopathy to students. We must strongly educate the students on periodic eye check-up and its importance which prevents needless blindness and visual dysfunction and other ocular related complications due to diabetes. We must educate students in a way that everyone must have basic knowledge about diabetes and how it causes occupation complications and irreversible blindness.

### Limitations

Small sample size and sample bias. Since this study was conducted among the first-year medical undergraduates, a group which might have somewhat better knowledge about the disease, these results could not be applied to the general population.

### CONCLUSION

The awareness about diabetes mellitus is high among students. But students lack knowledge on ocular complications due to diabetes and they are unaware about how diabetes affects the eye and causes visual dysfunction, blindness and vision threatening diabetic retinopathy. So, it is necessary to educate every single student about the complications of diabetes and how it affects the eye. It is important to Implement and conduct awareness programs to increase awareness among students. It is also important

to educate the students on periodic eye check up to prevent complications.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

### REFERENCES

1. Kowluru RA, Chan PS. Oxidative stress and diabetic retinopathy. *Exp Diabetes Res*. Kowluru RA, Chan PS. Oxidative stress and diabetic retinopathy. *Exp Diabetes Res*. 2007;2007:43603.
2. Pelino CJ, Pizzimenti JJ. Contemporary care protocols for DR and DME. *Gale Academic Onefile*. 2012;8(149):
3. Rowe NG, Mitchell PG, Cumming RG, Wans JJ. Diabetes, fasting blood glucose and age- related cataract: the Blue Mountains Eye Study. *Ophtha Epidemiol*. 2000;7:103-14.
4. Diabetes Prevention Program Research Group: Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med*. 2000;346:393-403.
5. Tuomilehto J, Lindstrom J, Eriksson JG, Valle TT, Hamalainen H, Ilanne-Parikka P et al. Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med*. 2001;344:1343-350.
6. Stovring H, Andersen M, Beck-Nielsen H, Green A, Vach W. Rising prevalence of diabetes: evidence from a Danish pharmaco-epidemiological database. *Lancet*. 2003;362:537-8.
7. Klein R. The Wisconsin epidemiologic study of diabetic retinopathy III. Prevalence and risk of diabetic retinopathy when age is less than 30 or more years. *Arch Ophthalmol*. 1984;102:527-32.
8. Semeraro F, Cancarini A, Dell'Omo R, Rezzola S, Romano MR, Costagliola C. Diabetic retinopathy: vascular and inflammatory disease. *J Diabetes Res*. 2015;582060:16.
9. Resnikoff S. Global data on visual impairment in the year 2002. *Bulletin of the World Health Organisation*. 2004;82:844-51.
10. Cho N, Whiting D, Forouhi N. *IDF Diabetes Atlas*, 7<sup>th</sup> edition. 2015.

**Cite this article as:** Charles L, Kumaresan V, Puri SK. Awareness on diabetes and its ocular complications among first year medical undergraduates. *Int J Adv Med* 2023;10:19-22.

## APPENDIX

### ***Sample questions from the questionnaire.***

- 1) Do u know about diabetes mellitus?
  - a) Yes
  - b) No
- 2) Do you know that in Diabetes there is increase in blood sugar level?
  - a) Yes
  - b) No
- 3) Lifestyle modification can help us prevent/ control this disease.
  - a) True
  - b) False
- 4) Do you know Diabetes can affect the eye and causes complications in eye?
  - a) Yes
  - b) No
- 5) Are you aware that diabetes can damage other organs in the body?
  - a) Yes
  - b) No
- 6) Did you know that there are 2 types of diabetes- type 1 and type 2 diabetes?
  - a) Yes
  - b) No
- 7) Do you think by controlling the blood sugar levels we can prevent/delay the ocular and other complications?
  - a) Yes
  - b) No
- 8) Diabetes can cause irreversible damage to the eye and can lead to blindness.
  - a) True
  - b) False