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KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING DIABETIC RETINOPATHY AMONG NURSING AND PHARMACY STUDENTS – A CROSS SECTIONAL STUDY

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A B S T R A C T

Introduction: Diabetic retinopathy, most common complication of diabetes mellitus, isa microvascular disorder and ranks as the fourth major cause of blindness globally. According to the Early Treatment Diabetic Retinopathy Study (ETDRS)and Diabetic Retinopathy Study (DRS) timely intervention can reduce vision loss. Nursing and Pharmacy students serve as the resource persons for diabetic patients seeking information regarding diabetes and diabetic retinopathy. Hence, this study aimed to assess the knowledge, attitude and practices regarding diabetic retinopathy among nursing and pharmacy students in tertiary care teaching hospital.

Objectives: To evaluate knowledge, attitude and practice regarding diabetic retinopathy among Nursing and Pharmacy students in tertiary care teaching hospital and to compare awareness between Nursing and Pharmacy students.

Methods: This cross-sectional study was conducted among 360 Nursing and Pharmacy students by convenience sampling in a tertiary care teaching centre in Puducherry, India, from August 2023 to January 2024. Data was collected by administering the semi-structured questionnaire after taking consent and entered in Excel sheet and analysis was done using SPSS software version 23.0

Results: About 63.9% of the participants were found to be males and 36.1% were females. 52.8% were nursing students and 47.2% were pharmacy students. 62.5% of the participants had good knowledge about diabetic retinopathy and 60% had a positive attitude towards the disease. However, good practices were found in only 52.2% of the study participants. On comparison, nursing students had better knowledge, attitude and practice regarding diabetic retinopathy than pharmacy students

Conclusion: According to our research, nursing and pharmacy students demonstrated a satisfactory knowlegde and positive attitude towards diabetic retinopathy. However, there is room for improvement in terms of practice level which will contribute to the early detection and treatment of diabetic retinopathy, ultimately reducing the risk of vision-threatening complications.

Keywords: diabetic retinopathy, diabetes mellitus, students

INTRODUCTION

Diabetes is becoming a critical public health issue, with its prevalence nearing epidemic levels worldwide [1]. The shift in lifestyle patterns and the process of urbanization have contributed to a recent surge in the incidence of this disease, particularly in developing nations like India. Since 1990, the burden of diabetes mellitus in India has been steadily increasing, with a more pronounced escalation observed since the year 2000. Notably, the prevalence of diabetes in India has risen from 7.1% in 2009 to 8.9% in 2019.India stands second after China in the global diabetes epidemic, with 77 million people affected with diabetes[2]. Diabetes mellitus predisposes individuals to a heightened risk of complications, ultimately leading to increased rates of morbidity and mortality among patients [3,4].

Diabetic retinopathy (DR) is a common microvascular complication of diabetes mellitus, leading to visual impairment and blindness in affected individuals [5]. It ranks as the fourth leading cause of blindness worldwide [3]. Studies haveshown that 34.6% of diabetic patients globally have been diagnosed with diabetic retinopathy[4,6]. According to National survey 2015-2019, the prevalence of diabetic retinopathy was found as 16.9% and the prevalence of sight threatening diabetic retinopathy was 3.6% [7]. The pathogenesis of DR is closely linked to hyperglycemia, which plays a crucial role in inducing vascular damage through various metabolic pathways, including the polyol pathway, accumulation of advanced glycation end products and activation of protein kinase C and hexosamine pathways [8].

Controlling blood sugar and blood pressure is crucial in preventing and managing the progression of diabetes and related complications [9,10]. The Diabetes Control and Complication Trial (DCCT) and the United Kingdom Prospective Diabetes Study states that strict control of blood sugar levels can reduce the risk of diabetic retinopathy and delay its progression[10].Nevertheless, as a result of the asymptomatic nature of the condition, many individuals with diabetic retinopathy only seek medical attention once the disease has progressed to an irreversible and advanced stage[11]. Therefore,routine screening of patients for diabetic retinopathy plays a vital role in early detection and prevention of visual impairment.[12-14]

The primary objective of this research was to evaluate the level of knowledge, attitude, and practice related to diabetic retinopathy among nursing and pharmacy students at a tertiary care teaching hospital in Puducherry, India. Since nurses and pharmacists often serve as the first point of contact for many patients, understanding their awareness and practice towards diabetic retinopathy is crucial for improving patient care and outcomes.

MATERIALS AND METHODS

STUDY DESIGN

This cross-sectional study was conducted in a tertiary care teaching centre in Puducherry, India, from August 2023 to January 2024. After obtaining the consent of each participant, a semi-structured questionnaire was administered to all the study participants.

DATA COLLECTION

The questionnaire was pretested in 5% of the student population before the actual data collection of the study population. This was done to assess the ambiguity and comprehensibility of the questionnaire and subsequent modification was done for ease of comprehension. The students who were included in the pretesting were excluded from the study. Experts in the research subject from the departmental research committee of the Institute validated the content of the questionnaire. Study subjects was recruited for the study using Convenience sampling after obtaining informed consent. All the college students were approached and informed about the study's objectives and assured that the information collected would be kept confidential. All the participants were provided with a semi-structured questionnaire with the condition that all the questions should be answered compulsorily and the anonymity of the participants was also assured and ensured among the study participants.

VARIABLES OF THE STUDY

The semi-structured questionnaire consisted of four parts. The first part consisted of the basic demographic details like age, gender, year of the study and course of the study. The second part consisted of 10 knowledge questions with answers on the 5-point Likert scale: strongly agree, agree, undecided, disagree and strongly disagree, which scored from 4 to 0, respectively. Based on the total score, the level of knowledge was divided into good, fair and poor. A cumulative score of more than 30 was considered good knowledge, a score between 10 and 30 was considered fair knowledge and a score of less than ten was considered poor knowledge. The third part consisted of 5 attitude questions with options in a similar Likert scale. A cumulative score of more than 15 is taken as a positive attitude, scores between 5 and 15 are taken as a neutral attitude and a score of less than five is taken as a poor attitude. The fourth part of the questionnaire consisted of 5 questions with multiple-choice answers. A score of more than five was considered good practice and a score of less than five was considered bad practice.

STATISTICAL ANALYSIS

All the data were entered in Excel and analysed through SPSS version 25 software. The chi-square test was used to test the association. Thep-value of < 0.05 was considered significant.

RESULTS

A total of 360 students participated in the study. Among them,190 were nursing students and 170 were pharmacy students. Mean age of the students were 21.35 ±1.1years. 62.9% of the students who participated in the study were male and 36.1% were female.

Table 1: Socio-demographic details of the study participants

Gender		Percentage

Male	130	36.1
Female	230	63.9
Course		
Nursing	190	52.8
Pharmacy	170	47.2
Year		
III	195	54.2
IV	165	45.8

KNOWLEDGE:

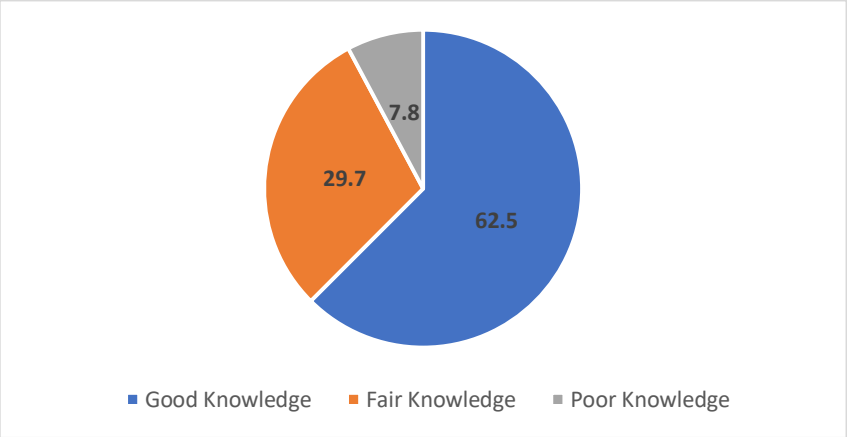
Out of 360 students, about 34.7% of the students were aware that diabetes Mellitus can affect the eyes and 31.1% strongly agreed that retina is mainly affected in diabetes. 31.9% of the students also strongly agreed that uncontrolled blood sugar levels can lead to the development of diabetes. Only 25% of the students acknowledged the correlation between the duration of the diabetes and disease progression. Most students know the necessity of dilated fundus examination to diagnose diabetic retinopathy. 30.5% of students wereaware that diagnosing different stages of diabetic retinopathy is important to prevent vision loss, 36.1% knew that diabetic retinopathy could lead to blindness and 33.3% agreed that strict blood sugar control could be beneficial in preventing the disease. 32.8% of the students firmly accepted that controlling cholesterol, blood urea and creatine also prevent the disease and 20.8% acknowledged the association between hypertension and diabetic retinopathy, as shown in Table 2.

Table 2: Knowledge regarding diabetic retinopathy among the pharmacy and nursing students

Knowledge questions	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Diabetes mellitus affects the eyes	125 (34.7)	128 (35.6)	47 (13.1)	40 (11.1)	20 (5.5)
Diabetes mellitus primarily affects retina	112 (31.1)	97 (26.9)	94 (26.1)	33 (9.2)	24 (6.7)
Poor control of blood sugars will lead to diabetic retinopathy	115 (31.9)	146 (40.6)	62 (17.2)	22 (6.1)	15 (4.2)
Theduration of diabetes has a direct association with diabetic retinopathy progression	90 (25)	119 (27.5)	72 (20)	49 (13.6)	30 (8.3)
To diagnose diabetic retinopathy, A dilated fundus examination by an ophthalmologist is necessary	125 (34.7)	128 (35.6)	47 (13.1)	40 (11.1)	20 (5.5)
Diagnosing various stages of diabetic retinopathy, that is, non-proliferative diabetic retinopathy, proliferative retinopathy and clinically significant macular oedema, is essential to prevent vision loss	110 (30.5)	97 (26.9)	94 (26.1)	35 (9.7)	24 (6.7)
Diabetic retinopathy can lead to blindness	130 (36.1)	115 (31.9)	26 (7.2)	60 (16.7)	20 (5.5)
Strict control of blood sugar includes control of fasting, postprandial blood sugar and glycosylated haemoglobin	120 (33.3)	141 (39.2)	40 (11.1)	40 (11.1)	19 (5.3)
In addition to strict control of blood sugar, control of cholesterol, blood urea and serum creatinine prevents diabetic retinopathy	118 (32.8)	98 (27.2)	54 (15)	50 (13.9)	40 (11.1)
Hypertension has direct correlation to the progression of diabetic retinopathy	75 (20.8)	65 (18.1)	89 (24.7)	81 (22.5)	50 (13.9)

On the evaluation of the cumulative knowledge score among the college students, about 62.5% had good knowledge regarding diabetic retinopathy, 29.7% had fair knowledge and only 7.8% had poor knowledge about diabetic retinopathy

Figure 1: Distribution of the students according to the level of knowledge



On assessing the association between the socio-demographic variables and the knowledge level of the study participants, significant association was noted with gender (p=0.018) and year of study (p<0.001). On comparison nursing students had better knowledge than pharmacy students and it was statistically significant as shown in Table 3.

Table 3: Relationship of socio-demographic details with knowledge score

	Good knowledge	Fair knowledge	Poor knowledge	p-value
Gender				
Male	150 (41.7)	70 (19.4)	10 (2.8)	0.018
Female	75 (20.8)	39 (10.8)	16 (4.4)	
Course				
Nursing	145 (40.3)	36 (10)	9 (2.5)	<0.001
Pharmacy	80 (22.2)	73 (20.3)	17 (4.7)	
Year				
III	101(28.1)	83 (23.1)	11 (93.1)	<0.001
IV	124 (3.4)	26 (7.2)	15 (4.2)	

ATTITUDE:

On assessing the attitude of students regarding diabetic retinopathy, about 29.7% students disagreed that diabetic patients do no require an eye examination if they do not exhibit any symptoms, 33.1% of the students expressed their disagreement with the statement that eye examination is unnecessary when diabetes is under control, 26.7% of the students informed that patients should acquire the knowledge about the disease from the treating physician and 33.9% of the students strongly agreed that the blindness resulting from diabetic retinopathy can be prevented by early diagnosis and treatment and 33.1% of the students agreed that lifestyle changes can aid in prevention of diabetic retinopathy, as in Table 4.

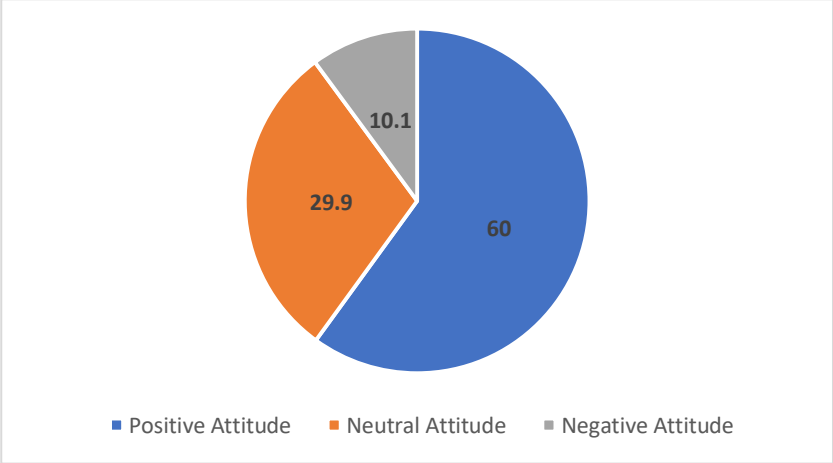
Table 4: Attitude regarding diabetic retinopathy among the nursing and pharmacy students

Attitude questions	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
The diabetic patients does not need an eye examination if they doesn't exhibit any symptoms	40 (11.1)	32 (8.9)	83 (23.1)	98 (27.2)	107 (29.7)
The diabetic patients don't require eye check-up if they have strict blood sugar control	34 (9.4)	46 (12.8)	57 (15.8)	104 (28.9)	119 (33.1)

The information on diabetic retinopathy should be given to patients by the treating physician of diabetes	96 (26.7)	95 (26.4)	35 (9.7)	84 (23.3)	50 (13.9)
Early diagnosis and treatment can prevent blindness due to diabetes	122 (33.9)	108 (30)	45 (12.5)	54 (15)	31 (8.6)
Lifestyle modification is significant in preventing diabetic retinopathy	119 (33.1)	130 (36.1)	46 (12.8)	48 (13.3)	27 (7.5)

On evaluating the cumulative attitude score among the college students, about 60% had positive attitude regarding diabetic retinopathy, 29.9% had neutral attitude and only 10.1% had negative attitude about diabetic retinopathy.

Figure 2: Distribution of the students according to the level of Attitude



On assessing the association between the socio-demographic variables and the attitude level of the study participants, there is a significant association noted with gender (p=<0.001) and year (p=0.002).On comparison nursing students had better attitude towards diabetic retinopathy than pharmacy students but it was not statistically significant as shown in Table 5.

Table 5: Relationship of socio-demographic details with Attitude score

Socio-demographic variables	Positive attitude	Neutral attitude	Negative attitude	p-value
Gender				
Male	144 (40)	80 (22.2)	6 (1.7)	<0.001
Female	72 (20)	28 (7.8)	30 (8.3)	
Course				
Nursing	122 (33.9)	48 (13.3)	20 (5.6)	0.116
Pharmacy	94 (26.1)	60 (16.7)	16 (4.4)	
Year				
III	127 (35.3)	58 (16.1)	10 (2.8)	0.002
IV	89 (24.7)	50 (13.9)	26 (7.2)	

PRACTICE:

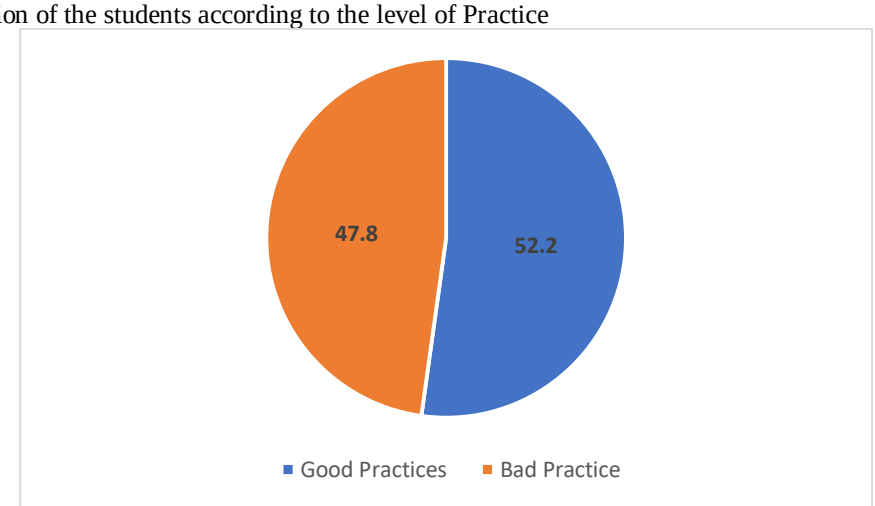
About 28.3% of the students stated that diabetic patients should undergo an annual eye check-up, followed by 27.5% believe that they should have an eye check-up once every six months and 30.8% of the students were aware that controlling sugar levels, lifestyle modification, laser treatment and surgeries were the treatment available for diabetic retinopathy. 26.9% of the students opted that the laser and intravitreal injection improve vision among patients with diabetic retinopathy, 25.9% agreed that vitrectomy surgery may be necessary in certain cases of diabetic retinopathy and 28.9% of the students were aware that regular follow-up is needed to maintain vision after the treatment, as in Table 6.

Table 6: Practice regarding diabetic retinopathy among nursing and pharmacy students

Practice questions		
How frequently diabetic patients undergo eye check-ups		
Every three months	87	24.2
Every six months	99	27.5
Yearly	102	28.3
Only when vision gets affected	72	20
Do you know about the treatment available for diabetes		
Good control of diabetes alone is adequate	55	15.3
Lifestyle modification	97	26.9
Laser treatment & intravitreal injection	40	11.1
Surgeries	57	15.8
All of the above	111	30.8
Laser and intravitreal injections in diabetic retinopathy improve vision in most of the cases		
Yes	97	26.9
No	99	27.5
Don't know	164	45.6
Vitrectomy surgery is required in some instances to regain vision		
Yes	93	25.8
No	89	24.7
Don't know	178	49.4
Regular follow-up is essential to maintain vision even after treatment		
Yes	104	28.9
No	67	18.6
Don't know	189	52.5

On evaluating the cumulative practice score among the college students, about 52.2% had good practice regarding diabetic retinopathy and 47.8% had bad practice

Figure 3: Distribution of the students according to the level of Practice



On assessing the association between the socio-demographic variables and the practice level of the study participants, there is a significant association noted with age ($p<0.001$) and year ($p<0.001$). On comparison nursing students had better practice towards diabetic retinopathy than pharmacy students and it was statistically significant as shown in Table 6.

Table 6: Relationship of socio-demographic details with practice score

	Good Practice	Bad Practice	p-value
Gender			
Male	118 (32.8)	112 (31.1)	0.642
Female	70 (19.4)	60 (16.7)	
Course			
Nursing	120 (33.3)	70 (19.4)	0.001
Pharmacy	68 (18.9)	102 (28.3)	
Year			
III	124 (34.4)	71 (19.7)	<0.001
IV	64 (17.8)	101 (28.1)	

DISCUSSION

Diabetic retinopathy is one of the significant causes of blindness among patients with diabetes mellitus. So, adequate knowledge of the disease is essential to prevent visual impairment. This study aimed to assess the knowledge, attitude and practice regarding diabetic retinopathy among nursing and pharmacy students. Diabetic retinopathy is one of the most common complications of patients with diabetes. In our study, most students know that diabetes affects the eye and retina is mainly affected by diabetic retinopathy. The duration of diabetes is directly related to diabetic retinopathy and strict control of the blood sugar, cholesterol, urea, creatinine and hypertension will aid in the prevention of the disease. In our study, about 62.5% of the students had good knowledge regarding diabetic retinopathy. Similar to our study, Panigrahi S et al.[15] also showed a higher knowledge regarding diabetic retinopathy among nursing students. Another study by Alharbi MM et al. [16] showed that about 57.5% of the medical students had good knowledge regarding diabetic retinopathy. In contrary, the study by Dharmadhikari S et al. [17] and Trepp R et al. [18], showed a low level of knowledge among the medical and nursing staff about the disease. A good level of knowledge is needed in the nursing and the pharmacy staff to educate the patient and create awareness among the patient regarding diabetic retinopathy.

Our study noted a positive attitude toward the disease among nursing and pharmacy students. In our study, more than half, 60% of the students, showed a positive attitude toward the disease. The study by Panigrahi S et al. [15] showed a positive attitude toward the disease among the nursing students. The study by Gazzaz et al. [19], Alharbi et al. [16]And Rao et al. [20] showed an optimistic attitude towards diabetes mellitus and diabetic retinopathy. The study by Althiabi S et al.[21] showed a significant association between attitude scores, age, academic year level and course of study, similar to our study results; however, the study by Alharbi MM et al. [16] showed 89.5% of the medical students had a positive attitude towards diabetic retinopathy. The study by Aro A et al.[22] also showed that lifestyle intervention helps improve the status of retinopathy.

Our study showed that half of the students had good practices towards diabetic retinopathy prevention. In our study, about 28.3% of the students recommended eye examination once a year, followed by 27.5% recommended for once in 6 months. Most of the study participants knew the management option for treating diabetic retinopathy. Students must learn that laser and intravitreal injections and vitrectomy improve the patient's vision in certain cases. It was noted that nearly half of the students didn't know the importance of regular follow-up after treatment. Similar to our study, the study by Panigrahi S et al. [15] showed similar practices among the study participants. However, Alharbi MM et al. [16] showed that about 79% of the participants showed good practices, which was higher than our study results.

CONCLUSION

This study revealed that students exhibited good knowledge (62.5%) and attitude (60%) towards diabetic retinopathy but practice level was comparatively lower (52.2%). So, there is a need to improve the practice level of the participants regarding diabetic retinopathy further. Implementing various strategies such as organizing continuous medical education programs, conducting workshops and incorporating information about Diabetic retinopathy into the curricula of the educational institutions is recommended to improve their knowledge and skills. It is crucial to focus on nursing students and pharmacy students as they serve as the first line of contact for patients. The success of the treatment relies upon their solid knowledge, attitude and practices, so special attention should be given during their training period.

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