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Knowledge, Attitude And Practice Regarding Diabetic Retinopathy Among Medical And Nursing Students of A Tertiary Care Teaching Hospital of Odisha: A Cross Sectional Study.

[1]Dr Suchitra Panigrahi,[2]Dr Rama Kristna Sahu,[3]Dr S N Jali [4]Dr Bandana Rath,[5]Dr S R Pati,[6]Dr M Kerketta

[1(]Assistant Professor, Dept. Of Ophthalmology, MKCG Medical College and Hospital, Berhampur, Odisha, India)
*[*2](Associate Professor, Dept. of Anatomy, M.K.C.G. Medical College, Berhampur,Odisha, India)*
[3](Assistant Professor, Dept. of Medicine, M.K.C.G. Medical College, Berhampur,Odisha)
[4](Associate Professor, Pharmacology, M.K.C.G. Medical College, Berhampur,Odisha)
[5](Senior Resident, Dept. Of Medicine, MKCG Medical College and Hospital, Berhampur,Odisha, India)
[6](Junior Resident, Dept. Of Ophthalmology, MKCG Medical College and Hospital, Berhampur,Odisha, India)
*Corresponding author*Dr Rama Kristna Sahu*

Abstract:
Back ground: *The purpose of the study was to assess the knowledge, attitude and practice of medical and nursing students towards diabetic retinopathy in diabetic patients.*
Material and Method: *This cross sectional descriptive study was conducted among the 8th semester medical students (n=127) , final year and intern nursing students (n=145) of MKCG Medical college and hospital. The data were collected by means of filling up of pre-tested specially designed questionnaires focused on knowledge, attitude and practice towards diabetic retinopathy. The answers were scored by assigning marks. Graph Pad prism software version 7.0 was used for statistical analysis.*
Results*: The study population consists of 272 medical and nursing students, 190 students were females and 82 students were males, among them156 students belonged to rural back ground and 116 belonged to urban back ground. The mean age of study population was 21.35 ± 1.1 years. Our study revealed, there was statistically significant difference in knowledge score among male and female students (P=0.007). Statistically significant difference was also found in their practice knowledge score (P <0.001). The knowledge score of students from urban back ground was significantly better than their rural counter parts (p=0.061), Significant difference was also found in their practice knowledge score (P =0.0016).*
Conclusion: *Medical and nursing students play a crucial role in the community in the prevention and early treatment of diabetic retinopathy. Our study identified that though their knowledge and attitude level was good but they need improvement in their practice knowledge level.*
Key Words*: Attitude, Diabetic Retinopathy, Knowledge, Practice, Students*

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I. Introduction

Diabetes mellitus is a global public health problem. Global prevalence of diabetes is 8.5% in adult population. [1] 422 million people are living with diabetes worldwide, out of that 69.2million diabetics live only in India.[2] The prevalence of diabetic retinopathy is increasing day by day, the number of persons with diabetes will double by 2030.[3] The morbidity caused by its ocular complications has paced this disease as the fourth leading cause of blindness in the world.[4] A pooled analysis from population based studies has found global prevalence of diabetic retinopathy is 34.6%(95% CI 34.5-34.8). [5] In a study conducted by All India Ophthalmological Society of India in 2014 the prevalence of diabetic retinopathy was found as 21.7% [6] ,with reported prevalence of diabetic retinopathy in India ranging from7.03% to 25%.[7,8,9,10,11,12] Fortunately visual loss and blindness due to diabetic retinopathy can be prevented or delayed with early detection and treatment. Effective management of diabetic retinopathy needs multi - disciplinary approach that is participation of the community and health personals. This study was conducted to assess the knowledge, attitude and practice of 8th semester medical students, final year and intern nursing students regarding diabetic retinopathy in diabetic patients. Their knowledge- referred as their understanding of the most important ocular complication of diabetes, the diabetic retinopathy, their attitude- referred as their feelings and preconceived ideas towards

diabetic retinopathy ,and their practice- referred as the ways in which they demonstrate their knowledge and attitude through their actions [13].The medical students' and nursing students' perceived knowledge, practice and attitude about diabetic retinopathy is essential for effective management of diabetic retinopathy, leading to improved quality of vision[14].They are the health personals who will spend longest time with the patients in the community and will serve as the resource persons for diabetic patients seeking information regarding diabetes and diabetic retinopathy [15,16, 17] . Their knowledge, attitude and practice play a vital role in the dissemination of information about diabetes and its most important ocular complication the diabetic retinopathy. [18, 19] We found the studies evaluating the knowledge, attitude and practice of diabetic retinopathy amongst medical and nursing students are in limited number in our country. So we conducted this study amongst nursing and medical students to assess their knowledge, attitude and practice regarding diabetic retinopathy.

II. Materials And Method

This was a cross sectional descriptive study, conducted in May 2017 in a tertiary level Govt Medical College and Hospital. Our hospital also has a government nursing school conducting a 3 year diploma course with 6 months internship. This study was pursued after getting approval from the Institutional Ethics Committee. 8th semester medical students (n=127) who completed ophthalmology subject and nursing 3rd year, intern students (n=145), a total of 272 students were included in this study, with a perception that by this time they had already acquired sufficient clinical knowledge regarding diabetes and its most important ocular complication, the diabetic retinopathy Informed consent was taken before their participation in this study. The participants were assured that the answers given in questionnaire would not be used as performance appraisal of the students. A pretested semi structured questionnaire was prepared based on KAP study guidelines. The questionnaires were distributed among the students in their respective class room. The participants were not allowed to consult each other while answering questions and the response sheets were collected after a 30 minute time period. The demographic information of the study population, their age, sex and residence status was recorded. The questionnaire comprised of 20 questions to assess the current knowledge, attitude and practice of students regarding diabetic retinopathy, which included 10 knowledge based questions,5 attitude based questions and 5 practice based questions. The 10 knowledge based questions test the knowledge of the students about ocular complication of diabetes, the diabetic retinopathy. The 5 attitude section questions assess their view on primary prevention of diabetic retinopathy, the practice section questions included 5 questions regarding the practice such as screening, intervention, management and counselling towards diabetic retinopathy. (14)

The knowledge questions were assigned scores depending on the correct responses. The correct response was awarded 5 points, 3 points if the person was unaware of the response and 0 marks for incorrect response .The knowledge and attitude questions where the responses of the students were recorded as per the extent of agreement to a particular statement on the five point Likert-type scale (strongly agree, moderately agree, undecided, moderately disagree, and strongly disagree)[7], the responses were assigned scores ranging from 5 points to strongly agree to 1 point for strongly disagree. Combined score marks of knowledge, attitude and practice related questions were regrouped in 3 categories. Students with 75-100% score was considered to have 'excellent' grade of response, with 50-74% was considered in fair grade and 0 to 49% was grouped under poor grade.[14]. The data were entered into the personal computer; using graph pad version 7.03 and MS Office excel for statistical analysis. Descriptive statistics like means, standard deviations, standard errors and percentages were computed. The fisher's exact or chi-square test or unpaired't' test were used to determine statistical significance. A P value of <0.05 was considered as statistically significant.

III. Results

A total of 272 students were distributed the questionnaires, which included 127 medical students and 145 nursing students. The mean age was 21.35 ±1.1years (range of 21-25 years). Among them 190 (69.9%) were females and 82(30.1%)were males.49 (8.8%)students were from rich economic back ground,185(68%) students were from middleclass back ground, 56 (20.6%) were from lower middleclass back ground and 7(2.6%) students were from poor family back ground. 156 (57.4%) students belonged to rural back ground and 116(42.6%) students belonged to urban background. [Table 1]

Table 1: Demographic Details of the Students

Total no of participants(n=272)	Number(n)	Percentage(%)
Gender		
male	82	30.1
female	190	69.9
Socioeconomic Status		
rich	24	8.8
middle	185	68.0
Lower middle	56	20.6
poor	7	2.6
Geographic Location		
urban	116	42.6
rural	156	57.4

Knowledge:

In our study 226(83%) students responded that diabetes affects eyes and 255(93.7%) students knew that retina of the eye was mainly affected by diabetes. Most of the students 258(94.8%) were well aware that Uncontrolled blood sugar will develop diabetic retinopathy. 218(78.1%) students agreed that strict control of blood sugar means, control of fasting, post prandial blood sugar and control of glycosylated haemoglobin. 226(83%) students knew along with strict control of blood sugar, control of blood cholesterol, blood urea, serum creatinine was required to prevent diabetic retinopathy in diabetic patients. Duration of diabetes is directly related to the progression of diabetic retinopathy. when asked about whether duration of diabetes is related to progression of diabetic retinopathy,204(74.9%) students responded correctly.174(64%) students knew that hypertension will cause progression of diabetic retinopathy. 219(80.5%) students agreed that dilated fundus examination by an ophthalmologist has to be done to diagnose diabetic retinopathy. When asked is it essential to diagnosis different stages of diabetic retinopathy (Non proliferative diabetic retinopathy, proliferative retinopathy and clinically significant macular oedema) to prevent vision loss, 200(73.6%) students responded positively.174(64%) students knew diabetic retinopathy will cause blindness. [Table2]

Table2: Responses to Knowledge questions

Questions	Responses by participants(n=272)				
Do you know diabetes affects eyes?	Yes 226 (83.0%) No 46 (16.9%)				
Which part of the eye is mainly affected by diabetes?	Cornea 7 (2.6%) Lens 10 (3.7%) Retina 255 (93.7%)				
	Strongly agree	**agree**	**undecided**	**disagree**	**Strongly disagree**
Uncontrolled blood sugar will develop Diabetic retinopathy	138(50.7%)	120(44.1%)	14(5.1%)	0	0
Strict control of blood sugar means control of fasting, post prandial blood sugar and Glycosylated haemoglobin	76(27.9%)	142(52.2%)	54(19.9%)	0	0
Along with strict control of blood sugar, control of blood cholesterol, blood urea and serum creatinine prevents diabetic retinopathy	63(23.1%)	163(59.9%)	41(15.1%)	5(1.0%)	0
Duration of diabetes is directly related to the progression of diabetic retinopathy.	57(20.9%)	147(54.0%)	61(22.4%)	7(2.6%)	0
Hypertension is directly related to the progression of diabetic retinopathy	59(21.9%)	115(42.3%)	63(23.25)	19(6.9%)	16(5.9%)
Dilated fundus examination by an ophthalmologist has to be done to diagnose diabetic retinopathy	20(7.4%)	199(73.2%)	53(19.5%)	0	0
Diagnosis of different stages of diabetic retinopathy that is Non proliferative diabetic retinopathy, proliferative retinopathy and clinically significant macular oedema has to be done to prevent vision loss	85(31.3%)	115(42.3%)	72(26.5%)	0	0
Diabetic retinopathy will cause blindness	59(21.7%)	115(42.3%)	63(23.2%)	19(6.9%)	169(5.9%)

Attitude:

In our study 212(76.6%) students disagreed that diabetic retinopathy patients did not need eye examination if they have no symptoms and 210(77.8%) students also disagreed that the diabetic patients need not get their eyes checked if they have strict control of blood sugar. 214 (78.6%) students agreed that information on ocular complication of diabetes that was regarding diabetic retinopathy should mainly be provided by the treating physician of diabetes and referral of diabetic patients to ophthalmologist should be done by them. Many of the students 203(74.6%) answered correctly when asked blindness due to diabetes was preventable if diagnosed early. 226(83%) students responded correctly that life style modification was an important factor to prevent diabetic retinopathy.[Table 3]

Table 3: Responses to Attitude Questions

Questions	**Responses**				
	Strongly agree	agree	Not decided	Disagree	Strongly disagree
The diabetic patient does not need eye examination if he has no symptoms	0	10(3.7%)	50(18.4%)	166(61.0%)	46(16.9%)
The diabetic patient need not get his eyes checked if he has strict blood sugar control	7(2.5%)	28(10.3%)	27(9.9%)	169(62.1%)	41(15.7%)
The information on diabetic retinopathy should be provided by the treating physician of diabetes	70(25.7%)	144(52.9%)	28(10.3%)	30(11.0%)	0
Blindness due to diabetes is preventable by early diagnosis and treatment	78(28.7%)	125(45.9%)	43(15.8%)	26(9.5%)	0
Life style change is very important in preventing diabetic retinopathy	69(25.3%)	157(57.7%)	41(15.1%)	5(1.8%)	0

Practice Knowledge:

Our study revealed 93(34.1 %) students had wrong concept that diabetic patients should undergo ocular examination only when their vision got affected. Only 92(32.8%) students had proper practice knowledge that good control of blood sugar, life style modification, laser, intravitreal injections and vitrectomy surgery were the treatment modalities available to prevent blindness in diabetic retinopathy patients. Only 48(17.6%) students were of the view that laser and intravitreal injections could restore vision in most of the cases and very small number 36(13.2%) of students knew that few cases also need vitrectomy to restore vision .When asked about ,diabetic retinopathy patients need regular follow up even after treatment to maintain and prevent further deterioration of vision, only 64(24.7%) students responded correctly.[Table 4]

Table 4: Responses to practice questions

Questions	**Responses**	
	number	Percentage
How frequently a person with diabetes undergo eye check up		
A. Every 3 month	38	13.9%
B. Every 6 months	70	25.7%
C. Yearly	71	26.1%
D. Only when vision get affected	93	34.1%
Do you know about the treatment available for diabetes?		
A. Good control of diabetes alone is adequate	42	15.4%
B. Life style modification	78	28.6%
C .Laser treatment& Intra vitreal injections	42	15.4%
D. Surgeries	18	6.6%
E. All of the above	92	33.8%
Laser and intra vitreal injections in diabetic retinopathy improves vision in most of the cases		
Yes	48	17.6%
No	48	17.6%
Do not know	176	64.7%
Vitrectomy surgery is required in certain cases to regain vision		
Yes	36	13.2%
No	79	29.0%
don't know	157	57.7%

Regular follow up is required to maintain vision even after treatment. Yes No Do not know	 67 34 171	 24.6% 12.5% 62.8%

KAP score:

The mean knowledge score of study population was 40.16 ± 0. 21, the mean attitude score was 15.93 ± 0.09 and the mean practice score was 12.47 ± 0.32. Unpaired t test revealed that there is a highly significant difference in mean scores among female and male participants with respect to knowledge and practice scores. ($p < 0.001$)

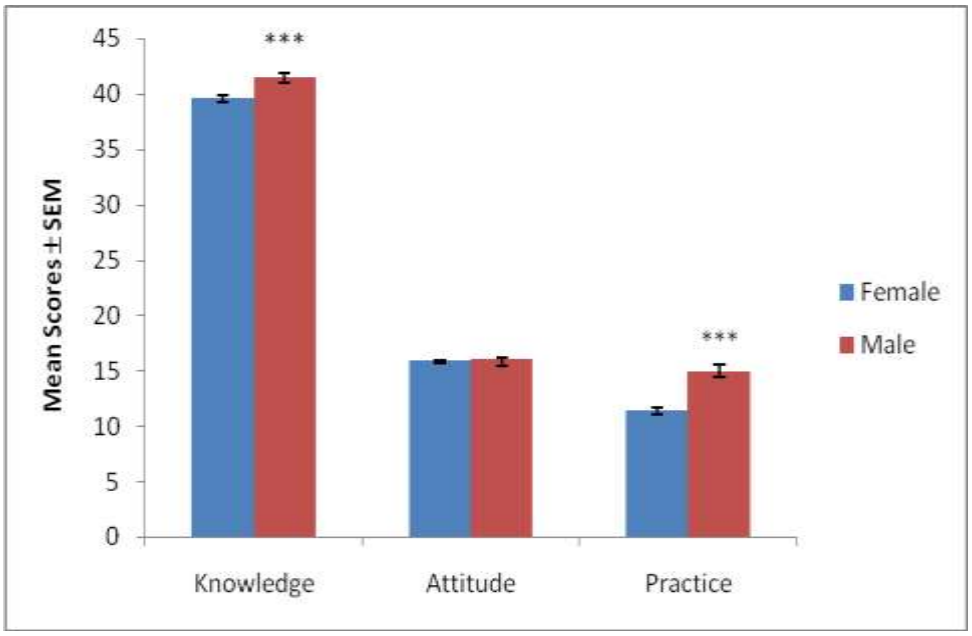

Fig-1: Mean scores of knowledge, attitude and practice among male and female participants

Out of total 272 student participants, the knowledge score of most of the students 220(80.9%) was in excellent range and while in 52(19.2%) in fair range, no student was found in poor range . The attitude score of 21 (7.7%) students was in excellent range, maximum students 246(90.4%) had attitude score in fair range and in 5 (1.8%) students the attitude score was in poor range. The practice knowledge score was excellent only in 40(14.7%)students, fair in 86(21.6%) students and was poor in 146(53.7%) students. There was statistically significant difference in knowledge and practice scores of male and female students. The knowledge score was 92.7% Vs 75.8% in excellent range, 7.3% Vs 24.2% in fair range(P=0.007) .The practice score was 28% Vs 8.9% in excellent range, 40.2% Vs 27.8% in fair range and 31.7% Vs 63.2% in poor range(P value<0.001).There was no statistically significant difference was found in the attitude score among male and female students.

The knowledge score of students from urban back ground was significantly better than their rural counter parts which was 86.2% Vs 76.9% in excellent score range ,13.7% Vs 23.8% in fair score range and 9.5% Vs 6.4% in poor score range (p=0.061). Statistically significant difference was also found in their practice score that was 12.4% Vs 8.9% students were in excellent practice score range, 34.5% Vs 29.5% in fair score range and 43.1% versus 61.6% in poor score range(P =0.0016). No statistically significant difference was found in the attitude score among students from urban and rural back ground. [Table: 5]

Table 5: Detail scores of knowledge, attitude and practice

Variables	Knowledge		Attitude			Practice		
	Excellent	Fair	Excellent	Fair	poor	Excellent	Fair	poor
Male(n=82)	76(92.7)	6(7.3)	6(7.3)	76(92.7)	0	23(28.0)	17(8.9)	33(40.2)
Female(n=190)	144(75.8)	46(24.2)	15(7.9)	170(89.5)	5(2.6)	53(27.8)	26(31.7)	120(63.2)
P value	0.007		0.325			<0.001		
Urban(n=116)	100(86.2)	16(13.7)	11(9.5)	104(89.7)	1(0.9)	26(12.4)	40(34.5)	50(43.1)
Rural(n=156)	120(76.9)	36(23.8)	10(6.4)	142(91.0)	4(2.6)	14(8.9)	46(29.5)	96(61.6)
P value	0.061		0.391			0.0016		

Figures in parenthesis express percentages

IV. Discussion

The information we received from our KAP study on diabetic retinopathy in medical and nursing students gave us an input to assess the lacunae in their knowledge, which will help us in future to enrich them with more knowledge by inoculating more study materials in their curriculum and conducting workshops and CMEs for them. Our study population is going to play a pivotal role in primary prevention of diabetic retinopathy in the community in future, so their core knowledge, attitude and correct practice knowledge towards the prevention and treatment of diabetic retinopathy will definitely decrease the prevalence of blindness in the community as most prevention programs of diabetes emphasize patient empowerment, education and community participation [19, 20]. Our study revealed that the knowledge information about diabetic retinopathy was good among the students, 226(83%) students responded that diabetes affects eyes and 255(93.7%) knew retina of the eye was mainly affected by diabetes, Most of the students 258 (94.8%) were well aware that uncontrolled blood sugar will develop Diabetic retinopathy, 174 (64%) students knew that diabetic retinopathy will cause blindness. This is in accordance with the study conducted in India where knowledge of medical and nursing students were satisfactory.[21] Study in Saudi Arabia among nursing students and study in Swizerland among medical and nursing students found mediocre knowledge among their students.[14][22],Whereas in other studies less knowledge among the student participants was observed.[23][24][25]

A positive attitude of medical and nursing students is one of the important factors for successful patient education and motivation for early diagnosis and prevention of complications of diabetic retinopathy in diabetic patients. Our study revealed positive attitude among students, 212(76.6%) students disagreed that diabetic retinopathy patients did not need eye examination if they have no symptoms, 210(77.8%) students also disagreed that the diabetic patients need not get their eyes checked if they have strict control of blood sugar, 203(74.6%) students answered correctly when asked blindness due to diabetes was preventable if diagnosed early,226(83%) students responded correctly that life style modification was an important factor to prevent diabetic retinopathy, in a study conducted in India, the researchers found positive attitude of students towards diabetic retinopathy in diabetic patients.[20]. The crucial practice knowledge information to prevent complications of diabetic retinopathy that will lead to blindness is lacking among most our students. 93(34.1 %) students had wrong concept that diabetic patients should undergo ocular examination only when their vision got affected. Only 92(32.8%) students had proper practice knowledge that good control of blood sugar, life style modification, laser, intravitreal injections and vitrectomy surgery were the treatment modalities available to prevent blindness in diabetic retinopathy patients. Only 48(17.6%) students were of the view that laser and intravitreal injections could restore vision in most of the cases and very small number 36(13.2%) students knew that few cases need vitrectomy to restore vision .When asked about whether diabetic retinopathy patients need regular follow up even after treatment, to maintain and prevent further deterioration of vision, only 64(24.7%) students responded correctly. Our study recorded the mean knowledge score as 40.16 ± 3.62 , the mean attitude score as 15.93 ± 1.6 and the mean practice score as 12.47 ± 5.32, similar results were found in studies conducted among medical and nursing students of King Faisal university, Saudi Arabia.[13,14]

The outcomes of the study will be useful in the planning of medical and nursing education, towards their approach regarding diabetic retinopathy, the most important ocular complication of diabetes, which results in blindness.

Limitation of the study

We consider the knowledge of third year and intern nursing students as adequate at par with 8th semester medical students who completed ophthalmology, as nursing schools tend to have rigorous teaching programmes to complete the clinical portions by this time .Many studies also found their knowledge to be same as medical students.[21] So we did not compare the KAP among the medical and nursing students.

V. Conclusion

This research study identified the need to improve practice knowledge of medical and nursing students towards early diagnosis and treatment of diabetic retinopathy to prevent blindness in diabetic patients. Though diabetes and diabetic retinopathy is already included in their study curriculum, proper emphasis should be given while teaching the subject .Continuous medical education programmes and workshops should be organised by department of Ophthalmology involving under graduate medical students and nursing students to enhance their knowledge, attitude and practice regarding diabetic retinopathy. The fresh medical graduates and nursing students are future health care providers to screen and manage diabetes and diabetic retinopathy in the community, the success will depend on their solid knowledge, attitude and practice, so special attention is required to teach these subjects during their study and training.

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