DOI: https://doi.org/10.53350/pjmhs221651309

ORIGINAL ARTICLE

Knowledge, Attitude and Practice of Final Year Medical Students and Interns on Diabetic Retinopathy in Saudi Arabia

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ABSTRACT

Background: Diabetic retinopathy (DR) is a preventable complication of uncontrolled diabetes. Following the guidelines in timely evaluation and treatment can delay the onset and slow disease progression. Therefore, medical students should have adequate knowledge, attitude, and practice (KAP) towards DR in preparation for their medical practice after graduation.
Aim: To evaluate the Knowledge Attitude and practices (KAP) among final year medical students and interns in College of Medicine, Majmaah University, Saudi Arabia.
Design: A cross-sectional approach with a self-administered questionnaire.
Methods: Following ethical and administration approval, a link with the questionnaire, generated on Google Forms, was distributed among final year medical students and interns at College of Medicine, Majmaah University. The total number of students was retrieved to be 120, where 80 students participated in this study to yield a response rate of 66%.
Results: Out of the 80 participants, 57.5% were in their internship, 71.25% were male, and 61.25% were aged 25 years or older. In terms of KAP, the knowledge score was borderline 3.95 (SD=1.06), while attitude and practice scores were good, scoring 7.45 (SD=0.93) and 2.17 (SD=0.72), respectively. The final-year medical students were significantly more knowledgeable about this condition than the interns and the common cause of visual impairment in patients with DR. No significant difference was noted in attitude or practice between the study groups.
Conclusion: Knowledge regarding DR was acceptable in final year medical students of College of Medicine. Future practicing physicians should be well educated about the methods to preserve vision among this patient population, especially in a resourceful setting with limited barriers to optimal practice.
Keywords: Diabetic retinopathy; Saudi; Medical students; Knowledge, Attitude; Practice.

BACKGROUND

Diabetes Mellites (DM) is a metabolic disorder that is related to carbohydrate, fat and protein metabolism disorders. It is highly prevalent with an estimate of 170 million people having this condition globally. The incidence is said to double by the end of 2025 (1). Blindness and diabetic retinopathy (DR) are avoidable consequences of diabetes if adequate measures were taken (2). Unfortunately, lower rates of optimal measures are reported leading to high prevalence rates of diabetic retinopathy. These rates ranged between 13.16% and 43.1% (3, 4). Longer duration since diagnosis is a significant predictor for developing this condition where the risk doubles after 5 years of diagnosis (5) and become 3.5 times higher after 12 years of diagnosis (3). Medical students and soon general practitioner, first line encounters with patients, should be aware of these figures, have good attitudes towards DR and practice according to the guidelines to limit their prevalence and delay progression of the disease.

It was found that only 54% of the general practitioner were aware of the guidelines of dilated eye examination annually (6). Additionally, most of the practicing physicians were knowledgeable about the methods of delaying the onset of this condition (7). However, due to certain barriers, only 50% of the practitioners implemented the recommended guidelines. Such barriers included lack of time, training and proper equipment and dilating eye drops (6, 7). Despite the lack of training, only 24% of physicians referred their patients with diabetes to ophthalmologists for specialized care (8).

On the other hand, studies have shown that adequate measures can be taken to avoid such consequences. Such measures include timely and continuous assessment and follow up, performance of cataract surgery (2), well-controlled blood pressure (4) and well-controlled blood sugar levels (5). In fact, it was noted in a regression analysis that the risk of developing DR was increased by 1.7 folds when the HBA1C was elevated by 2% (5).

Having mentioned that, medical education should be based on guidelines to ensure optimal knowledge, attitude and practice among newly graduating physicians. Although good knowledge and attitude was reported in one study in a similar context as the current, practice was less than optimal especially among the female medical students (9). Therefore, the current study aims to replicate a previous study evaluating KAP among medical students of Majmaah University and identify the gaps in knowledge, attitude and practice towards diabetic retinopathy among this study population.

METHODS

Designs: A cross-sectional design was undertaken through a self-administered knowledge, attitude, and practice scale questionnaire.

Sample: Final year medical students and interns at College of Medicine, Majmaah University, Saudi Arabia.

Sample size: Based on the data secured for the student affairs, the total number of medical students in the study years was 120. All participants were sent initial invitations and periodic reminders to secure a good response rate. The response rate was 66%. Those who participated in the study but had not taken the ophthalmology course were excluded from the study.

Procedure: Following the ethical and administration approval from the institutional review board and the university administration, respectively, data collection was initiated. All final year medical students and interns were invited to participate in this study. Potential participants were assured of their privacy and the confidentiality of their data which were to be de-identified. A link with the survey was generated in Google Forms and sent out to the eligible participants for data collection. In addition, reminders were sent out weekly for the data collection period, which took place during April - May 2022. The data collection form was developed in English and included the following sections:

A. Sociodemographic section: This section included the age, gender, and year of their studies.

B. The knowledge, attitude, and practice scale towards diabetic retinopathy: The original scale was used in previous studies to assess the same outcomes in different study populations. Psychometric evaluation has been reported to indicate good validity and reliability (8, 10). The current version was adopted in another study (9) to include elements from the American Diabetic Association. The scale includes six knowledge questions with one correct answer and one other or two incorrect answers. The scoring is a computed sum of the correct answers to a total of 6 with a cut-off score of 4 to indicate good knowledge. The attitude subscale includes four questions on a three-point Likert scale

ranging from zero and two, where zero indicates "undecided." The other two options were one "disagree" and two "agree" for questions one and three and were reversed for questions two and four since the questions were reversed. The total attitude score was eight, with a cut-off score of five to indicate a good attitude. Finally, the practice score was composed of three questions with one point for the correct answer from an option bank. A cut-off score of two indicated good practice. The same scale had been used previously in a similar setting with no reported difficulties (Alharbi et al., 2020).

Data analysis: Descriptive statistics were presented in means and standard deviations when continuous and in frequencies and percentages with categorical. Group analysis was done based on the study year (interns vs. final-year medical students) using the Mann-Whitney, considering the non-normality of the continuous variables. Normality was evaluated using the one-sample Kolmogorov-Smirnov test. P-value was set to less than 0.05 for significance with a power of 0.8, and data analysis was done using SPSS version 24.

RESULTS

Descriptive data: A total of 80 medical students were included in this study. More than half were in their internship, the majority were male participants (71.25%) aged 25 years or older (61.25%), as presented in Table 1.

Table 1: Sociodemographic characteristics of the study participants (N=77)

Variables	Total (N=80, 100%)
Age	
• 23	7 (8.75)
• 24	24 (30.0)
• >25	49 (61.25)
Gender	
• Male	57 (71.25)
• Female	23 (28.75)
Academic year	
• Final year	34 (42.5)
• Internship	46 (57.5)

Knowledge, attitude, and practice scores among the study participants

The total knowledge score was 3.95 (SD=1.06), indicating a borderline knowledge regarding diabetic retinopathy. Most medical students knew the correct answers for K1, K2, K3, K5, and K6. However, more thought that glycemic control alone was enough to reduce the risk of developing diabetic retinopathy rather than glycemic and blood pressure control. Regarding attitude, the mean score was 7.45 (SD=0.93), indicating a good attitude towards diabetic retinopathy. The majority agreed to the correct answers to the four attitude questions. As for the practice, the total score was 2.17 (SD=0.72), indicating good practice toward diabetic retinopathy. The majority answered correctly for P1 and P2, while the answers were divided for P3. The details for the knowledge, attitude, and practice data are presented in Table 2.

Table 2: Knowledge, attitude, and practice scores of the study participants (N=80)

Variables	Total (n=80, 100%)	Final year (n=33, 41.3%)	Internship (n=47, 58.8%)	P value
K1. The estimated prevalence of diabetic retinopathy in diabetic patients:				
• 20%	26 (32.5)	12 (36.4)	14 (29.7)	0.85
• 40%*	33 (41.2)	14 (42.4)	19 (40.4)	
• 70%	21 (26.2)	7 (21.2)	14 (29.7)	
K2. Diabetic retinopathy is a disease of:				
• Blood vessels*	60 (75.0)	28 (84.4)	32 (68.8)	0.88
• Optic nerve	20 (25.0)	5 (15.1)	15 (31.9)	
K3. The most critical risk factor to develop diabetic retinopathy in diabetic patients is:				
• Duration of DM*	68 (85.0)	30 (90.9)	38 (80.8)	0.21
• Hypertension	8 (10.0)	3 (9.1)	5 (10.6)	
• Nephropathy	4 (5.)	0 (0)	4 (8.5)	
K4. The risk of developing DR is reduced through:				
• Optimizing glycemic control	41 (51.25)	14 (42.4)	27 (57.4)	0.18
• Optimizing glycemic control and BP*	39 (48.7)	19 (57.6)	20 (42.6)	
K5. The most common cause of visual impairment in diabetic patients is:				
• Cataract surgeries	1 (1.3)	1 (3)	0 (0)	0.00
• Diabetic macular edema*	55 (68.8)	31 (93.9)	24 (51.1)	
• Glaucoma	4 (5.0)	1 (3)	3 (6.4)	
• Vitreous hemorrhage	20 (25.0)	0 (0)	20 (42.5)	
K6. Initial dilated and comprehensive ophthalmic examination of the diabetic patient should be:				
• Both type I and type II DM at time of diagnosis	5 (6.25)	4 (12.1)	1 (2.1)	0.18
• Type I DM after 5 years of diagnosis and type II DM at time of diagnosis*	61 (76.2)	23 (69.7)	38 (80.9)	
• Type I DM at diagnosis and type II DM after 5 years of diagnosis	14 (17.5)	6 (18.2)	8 (17)	
Total Knowledge score	3.95 (1.06)	4.39 (0.89)	3.64 (1.07)	0.00
A1. A patient with DM should have a regular ophthalmic examination.				
• Agree	78 (97.5)	31 (94)	47 (100)	0.23
• Disagree	1 (1.25)	1 (3)	0 (0)	
• undecided	1 (1.25)	1 (3)	0 (0)	
A2. There is no need for a patient to visit an ophthalmologist if their DM is well-controlled				
• Agree				0.10

• Disagree • Undecided	3 (3.75) 74 (92.5) 3 (3.75)	1 (3) 29 (87.9) 3 (9.1)	2 (4.3) 45 (95.7) 0 (0)	
A3. Does timely treatment of DM decrease/prevent DR? • Agree • Disagree • Undecided	 69 (86.3) 3 (3.8) 8 (10)	 29 (87.9) 2 (6.06) 2 (6.06)	 40 (85.1) 1 (2.1) 6 (12.8)	0.43
A4. Patients with DM often waste time and money undertaking eye check-up as most of the time their eyes are healthy • Agree • Disagree • Undecided	 3 (3.8) 72 (90) 5 (6.25)	 0 (0) 31 (93.9) 2 (6.1)	 3 (6.4) 41 (87.2) 3 (6.4)	0.33
Total attitude score	7.45 (0.93)	7.39 (1.05)	7.48 (0.85)	0.78
P1. Which category of patients with DM require a referral for an ophthalmic examination • All patients with DM* • Patients with visual symptoms only • Patients with retinal changes identified on ophthalmoscopy only	 74 (92.5) 2 (2.5) 4 (5)	 30 (90.9) 2 (6.1) 1 (3.0)	 44 (93.6) 2 (4.3) 1 (2.1)	0.48
P2. Should a patient with DR be referred for an ophthalmic examination undertaken by: • A PHC general practitioner • An ophthalmologist at a local hospital* • An optometrist	 9 (11.3) 69 (86.3) 2 (2.5)	 2 (6.1) 31 (93.9) 0 (0)	 7 (14.9) 38 (80.85) 2 (4.25)	0.08
P3. Which type of patient with DM is at high risk of developing DR? • A patient with type I DM • A patient with type II DM • Patients with either type I or type II DM*	 17 (21.2) 31 (38.7) 32 (40)	 4 (12.1) 18 (54.5) 12 (36.4)	 13 (27.7) 13 (27.7) 20 (42.5)	0.08
Total practice score	2.17 (0.72)	2.21 (0.59)	2.14 (0.80)	0.90

In terms of differences, none was noted between the final year medical students and the interns in all items except one. This was in the question asking about the common causes of visual impairment in patients with diabetic retinopathy, where the final-year students were significantly more knowledgeable than the interns. Additionally, the former scored significantly higher on the overall knowledge score when compared to their counterparts. On the other hand, no significant difference was noted between the groups in the attitude scale, neither in the individual items of the scale nor the total score. Similar results were also noted for the practice scale, where no difference was found between the groups. Further, no significant difference was noted between the genders across the three scores.

DISCUSSION

The study aimed to evaluate the knowledge, attitude and practice among final year medical students and interns in Majmaah University College of Medicine in Saudi Arabia. The scores were found to be suboptimal for the knowledge subscale and good for the attitude and practice subscales. The scores were somehow similar in a previous study in the same context when considering the divided scores between the three scale items (10). In a previous systematic review, the-below-than optimal knowledge scores were reported among patients, nurses, medical students, and even the general population in the Saudi setting (11). These findings highlight the need to augment the education about diabetes primarily and the possible and common complications of the diabetes pandemic (12). The higher attitude and practice scores reflect the adequate practice medical students are provided with during their internships and apprentices. However, these scores did not reflect on the knowledge of patients with diabetes nor on the medical practice and assessment from their medical practitioner. This is reflected in the lower rates of annual screening for DR rates and the poor knowledge among the general diabetic population in Saudi Arabia (13).

Although the guidelines reported that the development of DR is strongly associated with the duration of having diabetes, uncontrolled glycemia and blood pressure (14), more than half the sample considered glycemic control alone was enough to reduce the risk of DR. On the other hand, the majority were aware of the strong association between the duration of diabetes and the development of this condition in contrast to the previous study conducted in the same setting (10).

No groups difference was noted on any of the scale levels between the genders. This contradicted the findings of the previous study conducted in a similar setting which showed that male participants scored higher on the knowledge and practice scores than their female counterparts. On the other hand, females scored significantly higher on the attitude scale (10). These differences were absent in the current study.

The study has some limitations worthy of mentioning. First the small sample size limited the possibility of identifying significant associations between variables. This could be targeted in future studies through sample size calculation based on the main outcomes, KAP in this case. A larger sample size can be achieved through conducting the same study over the years to include participants of the same wanted categories from different student cohorts. Another way to increase the sample size would be to include medical students from other universities. The latter approach would also allow for greater generalizability. Another limitation is the limited sociodemographic data in the sample, which prevented in-depth analysis about the possible link between, and the impact of, such data on knowledge, attitude and practice.

In conclusion, the study highlighted the knowledge, attitude and practice among final year medical students and interns towards diabetic retinopathy. The knowledge level was suboptimal while attitude and practice were above the cut-off points reflecting good scores. The knowledge of students on such topic should be enhanced to reflect on better practice and improved patient outcomes especially in a resourceful setting with limited barriers to optimal practice. Additionally, future studies should include multiple settings to allow for generalizability.

Acknowledgement: The author would like to thank the Deanship of Scientific Research at Majmaah University for supporting this work under Project Number No. (R-2022-210)

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