ORIGINAL ARTICLE

# The knowledge attitude and practice regarding diabetes and diabetic retinopathy among the final year medical students of King Faisal University Medical College of Al Hasa region of Saudi Arabia: A cross sectional survey

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## Abstract

**Purpose**: The purpose of the study was to assess the knowledge attitude and practice of the final year medical students of king faisal university medical college towards diabetes and diabetic retinopathy.

**Materials and Methods:** A cross sectional survey was conducted in King Faisal university Medical college of Al Hasa province of Saudi Arabia in May 2012. The student population was the Final Year students of MBBS. All 96 students of final year MBBS were included in this study. The data were collected by means of filling up of pre-tested specially designed questionnaires focused on Knowledge, Attitude and practice towards Diabetes Mellitus and Diabetic retinopathy. The answers were scored by assigning marks. A SPSS 17 was used for statistical analysis.

**Results:** The mean of overall KAP score (±SD) for all the respondents were 64.75 ± 11.17 (Maximum 100). Male students scored better than the females students (65.30, $P = 0.02$ vs. 64.18, $P = 0.02$). The male student scored better in the knowledge (35.83 vs. 34.05, $P = 0.018$) and practice (13.63 vs. 12.95, $P = 0.045$) category while the attitude score of female student (17.16 vs. 15.83, $P = 0$ .020) was significantly higher than the male students. The main weakness of knowledge was on epidemiology of Diabetes Mellitus (DM), the follow up of the diabetic patient for the screening of diabetic retinopathy and the relation of duration of diabetes with the development and progression of diabetic retinopathy. Many students believed that diabetes is more prevalent among the uneducated people. Ninty percent students did not know the proper angle of insulin injection.

**Conclusion**: This survey highlights some of the lacuna in the teaching system of the medical students and identified the need for improvement in their knowledge, attitude and practices for treating the patients with diabetes and diabetic retinopathy. This can be done by incorporating special syllabus focusing on diabetes and diabetic retinopathy in their teaching programme.

**Key words:** Attitude, diabetic retinopathy, knowledge, practice

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## Introduction

Diabetes mellitus (DM) is a global public health problem.[1] The prevalence of diabetes mellitus is increasing and the number of persons with the disease will double by 2025.[2] The morbidity caused by its ocular complication has placed this disease as the 4th leading cause of blindness worldwide.[3] There are 4 million cases of blindness due to diabetic retinopathy[4] (Vision 2020); this is expected to increase enormously in the coming years with the increase in the

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prevalence of DM. Fortunately, the visual loss and the blindness due to diabetic retinopathy can be prevented or at least delayed with early detection and timely intervention. Effective management of diabetic retinopathy needs multidisciplinary approach and participation of the community, paramedical personnel, medical practitioners, and medical students. Their knowledge-referred as their understanding of diabetes and diabetic retinopathy, their attitude-referred as their feelings and any preconceived ideas toward diabetes and diabetic retinopathy, and their practice-referred as the ways in which they demonstrate their knowledge and attitude through their actions have very important role in increasing awareness of the disease prevention and health promotion among the diabetic population. The recently concluded study in Al Hasa region of Saudi Arabia[5] and various studies conducted in different places have showed inadequate knowledge, attitude, and practice among the general practitioners and the medical students about the diabetes and diabetic retinopathy. To the best of our knowledge, no study regarding knowledge, attitude, and practice of the medical students on diabetes and diabetic retinopathy has been conducted in Saudi Arabia.

This study was conducted to assess the knowledge, attitude, and practice of final year students and the interns of King Faisal University Medical College, Al Hasa regarding diabetes and diabetic retinopathy. As future primary care physicians, they are at the frontline of diabetes and diabetic retinopathy management. Their present curriculum does not emphasize these topics. Understanding their baseline knowledge, attitude, and practice will allow the Medical Education Department to re-examine their curriculum and design that is more appropriately targeted to the needs of diabetic community.

## Materials and Methods

This cross-sectional descriptive study was conducted in the month of May 2012. The study population consisted of 6$^{th}$ year students of King Faisal University Medical College of Al Hasa district of Saudi Arabia. We included all 96 students of 6$^{th}$ year of MBBS course in our study population.

A consent letter from the King Faisal University Research Cell was obtained before starting this research. The participants were assured that the outcome would not be used for performance appraisal of the individuals. To maintain the confidentiality, the students sent the completed questionnaires directly to the principal investigators, and the first page of the questionnaire containing the name of the physician was immediately removed. The questionnaires were sent to all the participants. The questionnaire, consisting of 22 questions, was designed to collect information on the demographic and professional data of the study population (four questions), current knowledge (10 questions), attitude toward diabetic and diabetic retinopathy patients (five questions), and practices (three questions) while dealing the patients suffering from diabetes and diabetic retinopathy. Each correct answer of knowledge and attitude questions was awarded 5 marks, while 25 marks were allotted to correct answers of practice section (total 100 marks). Each wrong answer was given 0 marks. The knowledge and practice section contained open-ended questions to avoid guessing while a five point Likert Type Scale was used to measure the degree of respondents in the attitude section. However, in some, a close-ended (yes or no) type was also used. Agree and strongly agree option of the answers were grouped under "yes" and neutral, disagree, and strongly disagree options were grouped under "no." The questionnaire was designed by the authors and was validated by the chief of the Ophthalmology Department of King Faisal University Medical College Al Hasa. The participants were requested to complete the answers without consulting materials, textbooks, or fellow staffs. They were given 30 min to do so. The answered questionnaires were then returned to the principal investigators directly. The data were entered into the personal computer using SPSS, version 17. Descriptive statistics for all variables was performed after scrutinizing the data. A $P$ value of $<0.05$ was considered as statistically significant.

## Results

### Basic characteristics of the study participants

All 96 students of 6$^{th}$ year of MBBS were distributed the questionnaires, and 73 students returned the questionnaires after answering properly. Twenty students did not return the questionnaires while three students refused, giving a response rate of 76%. The number of female students was higher than that of male students: 43 (58.9%) and 30 (41.1%), respectively [Table 1]. The average age was 23.85 ± 0.86 years (23-27 years). The source of information of the students about diabetes and diabetic retinopathy was the medical college education (43.8%), Internet (13.7%), journal and CME (8.2%), and combination of books with other sources (34.2%). When asked about any course taken by the students regarding how to educate the public regarding diabetes and diabetic retinopathy, only 21 (29%) of them said that they received a course of such type in the last 1 year.

### Diabetic-related knowledge attitude and practice of the 6$^{th}$ medical students

The mean of the overall KAP score for all the respondents was 64.75 ± 11.17 (maximum, 100). The knowledge score was 34.90 ± 6.95 (maximum, 50), attitude score was 16.64 ± 4.17 (maximum, 25), and practice score was 13.19 ± 3.8 (maximum, 25).

**Table 1: Demographic data and education about diabetes and diabetic retinopathy of the medical students**

| Variables | N | % |
|---|---|---|
| Gender | | |
| Male | 30 | 58.9 |
| Female | 43 | 41.1 |
| Mean age 23.85±0.861 years | | |
| Education about diabetes and diabetic retinopathy | | |
| The source of information about diabetes and diabetic retinopathy | 32 | 43.8 |
| Medical college education | 10 | 13.7 |
| Internet | 6 | 8.2 |
| Journal and continued medical education | 25 | 34.2 |
| Combination of books with other sources | 21 | 28.8 |
| Course taken by the students regarding how to educate the public regarding diabetes and diabetic retinopathy | | |
| Yes | 71.2 | |
| No | 62 | |

**Table 2: Knowledge, attitude, and practice scores for 6th year medical students by gender**

| Variables | Mean (SD) knowledge attitude practice total | | | |
|---|---|---|---|---|
| | Maximum 50 | Maximum 25 | Maximum 25 | Maximum 100 |
| Gender | | | | |
| Male | 35.83 (6.4) | 15.83 (4.1) | 13.63 (3.7) | 65.30 (10.6) |
| Female | 34.05 (7.3) | 17.16 (4.0) | 12.95 (3.9) | 64.18 (11.6) |
| *P* value | 0.018 | 0.020 | 0.045 | 0.02 |

SD=Standard deviation

The mean overall KAP score for female students (64.18, $P = 0.02$) was lower than that of the male students (65.30, $P = 0.02$). The male student scored better in the knowledge and practice category, whereas the attitude score of female student was significantly higher than the male students. Table 2 shows the KAP scores by sex.

## Knowledge pattern

Table 3 shows the response to students' knowledge questions regarding diabetes mellitus and diabetic retinopathy. Almost all of the students knew the symptoms, causes, and complications of diabetes mellitus. More than 70% of the students ($n = 52$) did not know the prevalence of diabetes mellitus in Saudi Arabia and about 40% ($n = 28$) did not know the risk factors for diabetic retinopathy. When asked about the follow-up of diabetic patients for diabetic retinopathy screening, more than 50% ($n = 42$) answered correctly.

Almost two-third of the students knew the treatment and specific risk factors of diabetic retinopathy but only 34 (46%) students knew that the chance of a diabetic patient getting diabetic retinopathy after 20 years was almost 100%. However, 65 (90%) students knew the correct target level of Hb1AC for good glycemic control.

## Attitude pattern

Regarding attitude toward diabetic and diabetic retinopathy patients, 26 (36%) students agreed that diabetes is more common among the uneducated people than the educated people. Almost all students (96%) agreed that all diabetic patients must be referred to ophthalmologist for routine ophthalmological examination for the detection of diabetic retinopathy. More than 50% ($n = 42$) of the students disagreed with the statement that "as long as diabetes is kept under control, there is no need to worry about diabetic complications." Fifty-four percent of the students agreed with the statement that "if the diabetic is treated early on, diabetic retinopathy can be prevented." While most of the students (93%, $n = 68$) strongly disagreed with the statement that "patients with diabetes often waste their time and money in eye check up as most of the time eyes of the diabetics are normal" [Table 4].

## Practice pattern

Table 5 summarized the medical students practice for diabetes and diabetic retinopathy management. Forty-eight (66%) students correctly mentioned that both type 1 (after 5 years of diagnosis) and type 2 diabetic (at the time of diagnosis) patients should be referred to the ophthalmologist for routine eye screening exam for the detection of diabetic retinopathy and almost all of them (99%, $n = 72$) followed the guideline laid by American diabetic association for the advice to the patients with diabetes. When asked as what should be the angle of insulin injection, 90% of the students mentioned that it should be 45° instead of 90°.

# Discussion

This research was aimed to assess the knowledge, attitude, and practice of the final year medical students toward the diabetic and diabetic retinopathy patients. The mean of the overall KAP score for all the respondents was 64.75 ± 11.17 (maximum, 100), which was average standard for the evaluation of medical students. A similar study conducted in Pakistan found a highest KAP score of more than 70% among the medical students of clinical group.[6]

This study revealed that most of the medical students were not aware of the prevalence of diabetes in Saudi Arabia and more than 40% of them did not know the risk factors for diabetic retinopathy. Given the increasing prevalence of diabetic retinopathy in Saudi Arabia[7] and the evidence that diabetic retinopathy is mostly diagnosed at the primary health care level where most of these medical students are supposed to work, it is mandatory for them to know the risk factors and the correct diagnostic criteria. In a recently concluded study conducted in the same area of Saudi Arabia, researchers have found lack of knowledge of epidemiology of diabetes among the general practitioners.[5,4]

**Table 3: No./percentage of correct knowledge of epidemiology, diagnosis, and treatment of diabetes mellitus and diabetic retinopathy among the 6th year medical students**

| Statements | No. | % |
|---|---|---|
| Symptoms of diabetes mellitus | 73 | 100 |
| Main causes of diabetes mellitus | 68 | 93.2 |
| Parts of the body affected by diabetes mellitus | 67 | 91.8 |
| Prevalence of diabetes in Saudi Arabia | 21 | 28.8 |
| Which diabetic patients are at greatest risk for diabetic retinopathy? | 45 | 61.6 |
| How often would you advice follow-up for diabetic patients for ophthalmic exam? | 42 | 57.5 |
| What is the treatment for a patient with diabetic retinopathy? | 51 | 69.9 |
| Acceptable target range for Hb1Ac for most of the diabetic patient | 65 | 89 |
| Specific risk factors for onset and progression of diabetic retinopathy | 54 | 74 |
| The percentage of patients with diabetes having some level of retinopathy after 20 years of disease | 34 | 46.6 |

**Table 4: Evaluation of medical students' attitude on diabetes mellitus and diabetic retinopathy management**

| Statement | Response in No./percentage | | |
|---|---|---|---|
| | Agree | Undecided | Disagree |
| | No. (%) | No. (%) | No. (%) |
| More uneducated people have diabetes than who are educated | 28 (35.6) | 16 (21.9) | 31 (42.5) |
| All diabetic cases must be referred to the ophthalmologist for routine eye exam | 70 (95.9) | 1 (1.4) | 2 (2.7) |
| As long as the diabetes is kept under control, there is no need to worry about diabetic complications | 31 (42.5) | 6 (8.2) | 36 (49.3) |
| If the diabetes is treated early on, diabetic retinopathy can be prevented or delayed | 39 (53.4) | 15 (20.5) | 19 (28.1) |
| Patients with diabetes often waste time and money in eye check up as most of the time eyes of diabetes are normal | 5 (6.8) | 10 (13.7) | 58 (79.5) |

**Table 5: No./percentage of correct answers to questions related to medical students' practice**

| Questions | *N* (%) |
|---|---|
| When will you refer the diabetic patients to the ophthalmologist (according to the type) | 48 (65.9) |
| What advice do you give to the patient with diabetes? | 72 (98.6) |
| What should be the angle of insulin injection | 8 (10%) |

Attitude of the physician plays an important role in managing any disease especially the chronic diseases like diabetes and diabetic retinopathy. Improper attitude of the medical students who are the future physicians can be one of the barriers for proper diabetic and diabetic retinopathy management.[8]

Although almost all of the students in this study strongly agreed that all diabetic patients must be referred to ophthalmologist for routine ophthalmological examination for the detection of diabetic retinopathy, many of them believed that "as long as diabetes is kept under control, there is no need to worry about diabetic complications." However, the fact is that all the diabetic patients whether controlled or uncontrolled should be screened for diabetic retinopathy and for other complications. Studies such as DCCT and UKPDS have proved that the complications of diabetes can be delayed but cannot be completely prevented by diabetic control.[9]

Many students in our study believe in the myth that diabetes is more prevalent among the uneducated people. This highlights the confusion persisting among the medical students regarding practice toward diabetics. Most of the students in our study did not know the practice of accurate angle of insulin injection which is 90°. Accurate angle of insulin injection is necessary for its proper action. Similar studies done in Pakistan and Saudi Arabia have also found the same confusion among the general practitioners.[5,6]

## Conclusion

This survey highlights some of the weakness in the knowledge, attitude, and practice of the medical students toward the management of diabetes and diabetic retinopathy. This points out some lacuna in the teaching system of the medical students. The fresh medical graduates who are the future family physicians can be the most proficient healthcare providers to manage and screen for diabetes and diabetic retinopathy in the community. The success will depend on their solid knowledge, attitude, and practice which can be taught by special attention on their training for diabetes and diabetic retinopathy during their teaching.

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