

RESIDENTS CORNER

Practical Diabetes Knowledge of Final-Year Medical Students in Tripoli, Libya

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Abstract

Objectives: To evaluate the practical knowledge of final year medical students as it relates to care of patients with diabetes. **Methods:** A convenient sample of 325 students (2006) from the Faculty of Medicine at Al-Fateh University, Tripoli, Libya was studied. An Arabic "Short Diabetes Knowledge Test" consisting of 24 multiple choice questions (14 general questions and 10 questions specific to insulin-treatment issues) was used. **Results:** The mean total score was 76.7% [18.4/24 (range 9-24)], 71.4% [10.0/14 (range 4-10)] for the general questions and 85% [8.5/10 (range 4-10)] for insulin-treatment related questions. The highest scores (>90% correct) were related to clinical management issues such as hypoglycemia, insulin-dosing, driving, and complications. Whereas, the lowest scores (<50% correct) were in four questions related to dietary education. **Conclusions:** This information should be helpful in planning the diabetes curriculum for medical students.

Key Words: Diabetes, medical students, undergraduate medical education, final clinical year, diabetes knowledge

Introduction

Diabetes is increasingly a major public health problem worldwide (1). Its impact is particularly felt in the developing countries, in the Middle East and North African regions in particular (2,3). Modern diabetes care emphasizes patients' empowerment and self-management. This is nurtured by both education and motivation (4). In general, diabetic education is the duty of diabetes nurse specialists or diabetes educators, a professional group that is not readily available in developing countries (5). However, doctors continue to have the overall responsibility and leadership role. Future doctors should possess basic knowledge by the time they qualify. To this end, the basic practical diabetes knowledge of final year medical students was assessed. An attempt was made to relate this to their exposure to learning opportunities obtained from attending diabetes care clinics during their medical training, as well as from personal and family experiences.

Materials and methods

A total of 325 final year medical students (2006), Al-Fateh

University, Tripoli, Libya were included. Convenience sampling was used and almost all those approached agreed to participate. Educational authorities approved the study and informed consents were obtained from all participants. The purpose of the study was explained both verbally and in writing; namely, an anonymous assessment

of knowledge of practical issues related to diabetes care and the knowledge source. A 24-item "Short Diabetes Knowledge Test" in Arabic was administered. The test was modified from a previously published test at the suggestion of the original authors with their expressed permission (6). This 24-item test was representative of general knowledge

Table 1. The contents of the modified Diabetes Knowledge Questionnaire (DKT-24) and the percent of correct responses achieved by the total cohort of the respondents. Questions were re-phrased due to space limitations.

The question and most appropriate completion statement (in parenthesis)	Correct (%)
1. The diabetes diet is (a healthy diet for most people).	79.4
2. Which of the following is highest in carbohydrate (baked potato).	93.0
3. Which of the following is highest in fat? (Low fat milk).	43.4
4. Which of the following is a "free food"? (less than 20 calories per serving).	36.0
5. HbA1c is a test of average blood glucose level for the past (6-10 weeks).	73.2
6. Which is the best method for testing blood glucose? (Blood testing).	81.4
7. What effect does unsweetened fruit juice have on blood glucose?(Raises it).	29.8
8. Which should not be used to treat low blood glucose?(1 cup diet soft drink).	62.7
9. What effect does exercise have on blood glucose?(lowers it).	71.7
10. Infection is likely to cause an increase in blood glucose.	68.3
11. The best way to take care of your feet is to (look at and wash them each day).	77.0
12. Eating foods lower in fat decreases your risk for (heart disease).	98.2
13. Numbness and tingling may be symptoms of (nerve disease).	97.2
14. Which of the following is usually not associated with diabetes (lung problems).	99.7
15. Signs of ketoacidosis include (vomiting).	77.1
16. What to do when you are sick (Test for glucose and ketones more often).	86.2
17. The most likely time to have hypoglycemia with NPH excess (6-12 hours).	74.2
18. Realized at lunch that you missed your insulin, What to do? (Check BG).	75.7
19. If you are beginning to have a hypoglycemia, you should (drink some juice).	93.2
20. Low blood glucose may be caused by (too much insulin).	94.1
21. If you take morning insulin but skip breakfast (blood glucose will decrease).	94.4
22. High blood glucose may be caused by (not enough insulin).	86.4
23. Most likely cause a hypoglycemia (heavy exercise).	83.9
24. Insulin-treated driver with hypoglycemia (stop driving and treat it).	96.2

Table 2. Select characteristics of the participating students (total number 325)	
Characteristics	Positive Responders
Have you had internal medicine posting yet?	75.2%
Have you been to the diabetes center?	18.6%
Do you have a family history of diabetes (in the household)?	36.2%
Were you involved in their care?	75.8%
Do you have a health care professional in the family?	31.1%
Do you have a personal interest in health-related lay magazine in Arabic?	49.0%

of diabetes (Table 1). The initial 14 items tested knowledge about non-insulin-dependent diabetes. The entire 24 items could be administered to people who use insulin, of which the first 14 questions cover general living with diabetes, and last 10 questions specifically cover insulin-treatment issues. The original 23-item Diabetes Knowledge Test (DKT) in English is a well-established test developed by the Michigan Diabetes Research Training Center (7). Its psychometric properties confirmed the reliability of the various groups of items, as well as a difficulty index (percent of patients scoring this item correctly), and an item-to-group total correlation for each item. The additional

question was related to safety during fasting. The 24-item test takes approximately 15 minutes to complete (Table 1). Additional data were collected on the students' prior exposure to general medical and diabetes components of the final year course, household history of diabetes, personal involvement with diabetes care, health care professionals in the family, interest in lay Arabic health magazines, and future interests and career intentions. The answers were transferred into an Excel spread sheet (Microsoft Corporation, Redmond, USA) for descriptive analysis. The student T-test was used to compare the mean difference.

Table 3. The career aspirations of the surveyed students (only 269 students responded, the remaining had no definite intentions at this stage).	
Type/specialty of future career interest	Percentage
Medicine in general	18.6%
Surgery in general (including Urology)	18.6%
Pediatrics	18.2%
Obstetrics and Gynecology	15.2%
Ophthalmology	13.8%
Orthopedic Surgery	5.6%
Other specialties*	10.8%
* Including: General Practice (6), Dermatology (6), Forensic Medicine (5), ENT (4), Laboratory Medicine (2), Academic (2), Pathology (2), Public Health (1) and Psychiatry (1).	

Results

Characteristics of the participating students

More than 75% of surveyed students had completed their clinical course in internal medicine but less than 20% attended the specialized diabetes center (usually one full week) (Table 2). There was a history of diabetes in the household for over 33% of the students. Of that group, over 75% were involved in the family support and care of the individuals with diabetes. Just under 33% indicated the presence of a health care professional in the family, and about half confirmed a personal interest in health-related lay magazines in Arabic (Table 2). Only 269 students could affirm their intended future career choice. The majority expressed interest in the main medical specialties, namely surgery, medicine, midwifery and child health (Table 3).

Results of the Diabetes Knowledge Test

The total score (mean range) was 76.7% [18.4/24 (range 9-24)]. The score for the first 14 questions of general living with diabetes was 71.4% [10.0/14 (range 4-10)]. The score for the specific questions related to insulin treatment was 85% [8.5/10 (4-10) (85%)]. The scores in these subgroups of questions were significantly different ($p < 0.001$).

Overall results: responses to all of the questions individually are given in Table 1. The best scores ($>90\%$ correct) were related to clinical management of hypoglycemia, adjustment of insulin dosing, long-term complications of diabetes, and care when driving, whereas the lowest scores ($<50\%$ correct) were in four questions related to dietary education. There was a trend for better scores among students who attended medicine and diabetes clinical education recently 80% [19.2/24 range (12-24)], either course 77.1% [18.5/24 range (11-23)] than those who did not attend either course 74.6% [17.9/24 range (12-23)]. Though this did not reach statistical significance ($p = 0.06$). Similar trends were observed in the subgroups of the general questions and insulin-specific questions. However, there were no differences in the total scores between those who had a household history of diabetes 78.8% [18.9/24 range (12-24)] and others 76.3% [18.3/24 range (11-23)].

There was no impact of having a health care professional in the family ($n = 100$) or having a personal interest in following the lay Arabic health magazines ($n = 158$). There were no differences between those with future career aspirations that trended from medicine to surgery (77.5% vs. 76.3%, i.e. 18.6/24 vs. 18.3/24).

Discussion

This is the first study assessing the practical diabetes

knowledge of medical students in our region. This is particularly relevant in view of the increased burden of diabetes (2) and the increasing emphasis on the role of primary care in diabetes management. Doctors in the developing world must have basic and practical knowledge of diabetes care in the absence of comprehensive care (5). This study demonstrated that our sample of medical students have a good working knowledge of medical-type diabetic problems that enable them to deliver care and educate future patients. However, there were deficits in the dietary aspects of care. These findings call for more emphasis on the practical and clinically oriented teaching, including the multidisciplinary nature of diabetes care. The study population chosen is a convenient sample of final year students from one university. The curriculum in essentially all medical schools in Libya is similar to that used in Tripoli. Typically, students receive clinical tutorials and bedside teaching based on the clinical departments. It is therefore likely that the findings of this study are applicable to other medical schools in Libya. We did not document data on gender and did not suspect any differences to be detected.

Several reports have addressed diabetes knowledge in student nurses, interns, and residents, using similar but not identical methods. UK medical students scored 50% (26-77%) and general practitioners scored 60% (38-83%) on a diabetes knowledge questionnaire (8). Deficiencies in knowledge were mainly in the management of insulin-dependent patients during acute illness, indications for insulin therapy in type 2 diabetes, and, similar to our study, in several aspects of dietary management.

Clinically relevant knowledge and practical experience in the field of diabetes assessed at the time of medical school graduation was surveyed among 310 fourth year medical students in Germany (9). A 28-item questionnaire was administered based on level of knowledge of diabetic patients participating in one of the structured training programs for type 1 and type 2 diabetes. Shortly before graduation, the questionnaire showed lack of clinically relevant knowledge, particularly with regard to diet and practical aspects of diabetes therapy.

Mumtaz, et al (10) assessed diabetes knowledge among 366 medical students of Ziauddin University using a questionnaire. Overall, 77-89% of students knew that diabetes is a metabolic disorder, related it to the pancreas, and identified target organ of insulin action. Individual presenting symptoms were identified by 18-66% of students. More clinical students than preclinical knew about risk factors for diabetes (96% vs 86%, $p = 0.003$) and

that it is a preventable disease (89% vs. 51%, $p < 0.001$). A larger number from the clinical group than preclinical knew about screening (87% vs 30%, $p < 0.001$). Correct diagnostic criteria for diabetes according to the WHO was identified by 55% of clinical but only 6% of preclinical students ($p < 0.001$). Findings of the present study gave an explanation for the findings.

George, et al, (11) assessed confidence, practices and perceived training needs in diabetes care of post-graduate doctors in the UK. Many trainees perceived a need for more training in all aspects of diabetes care, suggesting a more structured post-graduate training in diabetes is needed.

Rubin, et al (12) assessed the diabetes knowledge of nurses and residents in surgery, internal medicine, and family practice. Collectively, all survey participants averaged <50% correct on several items. Internal medicine and family practice residents and inpatient nurses had similar but insufficient levels of knowledge about diabetes. Surgical residents had the most significant deficit of diabetes knowledge. This suggests that most nurses and residents would benefit from additional education in diabetes management. This reduced knowledge is disadvantageous when coupled with the reported attitude of some healthcare professionals who rated diabetes as not a serious condition (13).

In conclusion, the present study and previous work demonstrate a reasonable level of diabetes knowledge in medical students but this may not match the needs for the increasing burden of diabetes. The insufficient level of knowledge in some aspects related to “living with diabetes” and especially dietary managements may weaken the status of physicians being capable of offering or overseeing the therapeutic education of patients and preventive measures for the public. These findings should help guide future revisions of undergraduate curriculum and postgraduate training program.

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