

# DIABETES KNOWLEDGE AMONG SELF REPORTED DIABETIC FEMALE TEACHERS: AL-KHOBAR, SAUDI ARABIA

Nada A. Abahussain, PhD,\* Ahmed G. El-Zubier, FRCPI†

\*School Health Services, Al-Khobar, Ministry of Education, †College of Medicine, King Faisal University, Dammam, Saudi Arabia

**هدف الدراسة:** تهدف الدراسة إلى التعرف على المعرفة بمرض السكري لدى معلمات المدارس المصابات بالمرض في منطقة الخبر بالمملكة العربية السعودية.  
**طريقة الدراسة:** تمت دراسة عينة من 91 معلمة و تم جمع المعلومات عن طريق مقابلات فردية و باستعمال أسئلة خاصة. تم حساب مؤشر كتلة الجسم.  
**نتائج الدراسة:** أوضحت الدراسة أن مستوى معرفة المعلمات بمرض السكري كانت غير كافية. و كانت معرفتهن بأعراض نقص السكر في الدم ضئيلة. و قد لجأ 25% منهن إلى استعمال الأعشاب لعلاج المرض. و كان حوالي ثلاثة أرباع العينة يعانون من زيادة في الوزن و سمنة. و أشارت النتائج بوجود نقص في المعلومات العامة عن المرض. و قد تم تثقيف هذه العينة عن مرض السكري عن طريق نشرات و محاضرات و ورش عمل.  
**الخلاصة:** أظهرت الدراسة أن هنالك حاجة ماسة لتثقيف مرضى السكري و ذلك لرفع درجة الوعي الصحي للفئة التي أجريت عليها الدراسة.

**الكلمات المرجعية:** مرض السكري – معلمات المدارس -المعرفة – الأعشاب.

**Objective:** The objective of this study was to determine the general knowledge of diabetes among female diabetic school teachers in Al-Khobar, Eastern Province of Saudi Arabia.

**Methods:** A total of 91 female diabetic school teachers were interviewed in the School Health Clinic in Al-Khobar using a structured questionnaire. Their weight and height were measured and BMI was calculated.

**Results:** The results showed that understanding of diabetes was inadequate. Knowledge about symptoms of hypoglycemia was low. One-fourth (25%) of the sample of this study was using certain herbs for the treatment or management of diabetes mellitus. About three- fourths were overweight and obese. The results showed a deficiency of knowledge on the general aspects of diabetes mellitus. An appropriate educational material was prepared in the form leaflets, lectures and workshops.

**Conclusion:** This paper concludes that awareness and education about diabetes are needed urgently among the studied sample.

**Key Words:** Diabetes Mellitus, School teachers, knowledge, herbs.

## INTRODUCTION

Diabetes mellitus (DM) is a complex disease that has an impact on a large portion of the society. It is a growing public health concern in both developed and developing countries.<sup>1,2</sup> High prevalence rates of diabetes mellitus have been demonstrated in the populations of the Arabian Peninsula. Type 2 diabetes mellitus in particular,

is a major public health problem in Saudi Arabia.<sup>3-</sup>

<sup>5</sup> Rapid urbanization and social and economic transformation of the country have been accompanied by changes in lifestyle and by an increase in the incidence of the disease. While studies in the 1980s had shown a low prevalence of DM,<sup>6,7</sup> higher estimates of 12-15% have been shown in recent studies.<sup>8</sup>

Correspondence to:

Dr. Nada A. Abahussain, P.O. Box 2211, Al-Khobar 31952, Saudi Arabia E-mail: n\_abahussain@yahoo.com

The manifestations of diabetes cause considerable human suffering and enormous economic costs. Both acute and late diabetic complications are commonly encountered. The long-term complications represented by cardiovascular and cerebro-vascular diseases, nephropathy, retinopathy, and neuropathies are already major causes of morbidity, disability, and premature death in countries of the Eastern Mediterranean region.<sup>9-11</sup> Recent clinical outcome studies have made diabetics a target for primary care initiatives to improve the quality of care.<sup>12</sup>

Education of the health care team on the management of diabetes and on how to educate people with diabetes is one major area that requires strengthening.<sup>13</sup> Traditionally, the care of patients with diabetes has been provided by a range of health service professionals, including doctors, practice nurses, diabetes-nurse specialists, dieticians, chiropodists, opticians and consultant specialists. Of late, collaboration throughout primary, secondary and community care sectors has been encouraged.

The pharmacist's role in this area is underlined by the observation that diabetic subjects have a higher overall use of drugs compared with the general population. Education is another area in which the pharmacist can become involved. People with diabetes must be made aware of the implications of having diabetes and the need to take control of their condition.<sup>14</sup>

The objective of this paper is to assess the knowledge of female diabetic school teachers about the disease.

## METHODOLOGY

The study population was the female diabetic school teachers working in the girls' education sector in Al-Khobar, Eastern Province of Saudi Arabia. An announcement was made to all schools in the region for all diabetic female teachers to register. The total number of female teachers in Al-Khobar was 1848. A total of 111 diabetic cases were registered. Those registered were contacted, and 91 (82%) of them agreed to participate in the study. They were personally interviewed in the School Health Clinic in Al-Khobar using a structured questionnaire.<sup>15</sup> A teacher is considered diabetic if she has been diagnosed by blood glucose testing and has been on treatment (diet,

insulin or oral hypoglycemic drug OHD) for 3 months or more.

The body mass index (BMI) was used as an index of obesity. It was calculated as the weight in kilograms divided by the height in meters squared ( $\text{kg/m}^2$ ) (16). Obesity was graded to indicate the degree of risk to health.<sup>17</sup> The grading was set as in Table 1.

**Table 1:** Grading system for adults

|          |             |                  |
|----------|-------------|------------------|
| Ungraded | BMI < 20    | Underweight      |
| Grade 0  | BMI 20-24.9 | Desirable weight |
| Grade 1  | BMI 25-29.9 | Overweight       |
| Grade 2  | BMI 30-40   | Obese            |
| Grade 3  | BMI > 40    | Severely Obese   |

The questionnaire consisted of items on personal and medical characteristics besides those pertaining to the level of knowledge about the disease, those testing patient's level of self-care in the ability to follow dietary prescription, and level of compliance to medication. The questionnaire consisted of a number of statements that evaluated certain attitudes and conceptions that are common among the public.

Coded data were entered into personal computer and analyzed using the Statistical Package for the Social Sciences version 10.0.

## RESULTS

A total of 91 female diabetic teachers working in the educational sector in Al-Khobar Eastern Province of Saudi Arabia were included in this study. The mean age was  $40.63 \pm 5.28$ . Table 2 illustrates some general characteristics of the participants. The mean duration of diabetes was  $6.16 \pm 4.73$  years. Family history of diabetes was positive in 86% of the cases.

On the knowledge about the type of diabetes mellitus and symptoms of hypoglycemia, 6 of the sample (6.6%) stated that they had Type 1 diabetes mellitus, while only 9 cases (10.6%) out of total 85 stated that they had Type 2.

The knowledge about symptoms of hypoglycemia was as follows: 73% answered positively that they knew about the symptoms of hypoglycemia in general, yet unsatisfactory answers were given when asked about each symptom separately. For example, more than half of the sample answered positively on (Dizziness, impairment of vision, sweating), less than half of

them answered positively on (palpitations, lack of concentration, loss of consciousness, and sweating).

**Table 2: General characteristics of the participants**

| Characteristics                    | No. (%)   |
|------------------------------------|-----------|
| Age groups in years:               |           |
| 26-35                              | 13 (15.1) |
| 36-45                              | 61 (70.9) |
| 46-55                              | 12 (14.0) |
| Nationality:                       |           |
| Saudi                              | 88 (96.7) |
| Non-Saudi                          | 3 (3.3)   |
| Kind of work:                      |           |
| Governmental employee              | 88 (96.6) |
| Private                            | 3 (3.3)   |
| Educational level:                 |           |
| Low (elementary)                   | 5 (5.5)   |
| Average (intermediate & secondary) | 52 (57.2) |
| High (graduate & postgraduate)     | 34 (37.3) |
| Family history:                    |           |
| Positive                           | 79 (86.8) |
| Negative                           | 12 (13.2) |
| Body mass index:                   |           |
| Normal                             | 13 (14.3) |
| Overweight                         | 34 (37.3) |
| Obese                              | 37 (40.7) |
| Severely obese                     | 7 (7.7)   |

Forty-one point seven percent (41.7%) used only oral hypoglycemic medication (OHD), 26.4% were on diet only and 5.5% were on insulin. The rest used both OHD and diet or insulin and diet.

It seemed that many patients had the wrong answer or had “no idea” about the difference between oral and parenteral medications used for diabetes, whether they cause habituation, what the cost of drug is or whether to stop medications during an illness. The knowledge of medications among diabetics is summarized in Table 3.

Patient compliance with medications, diet and exercise was also assessed. It seems that patients were more compliant with medication (52.7%) and the least compliant with exercise (5.5%). Half of the sample sometimes followed diet restrictions given to them.

It was found that herbs were being used either individually or in a mixture of selected herbs for the management of DM though there is no documentation of their efficacy. These herbs varied in their use as shown: 31.9% used *Lupinus albus*, *Papilionaceae* (Termis) and *Allium sativum*, *Liliaceae* (Fresh garlic), 25.3% *Aloe*

**Table 3: Knowledge about antidiabetic medications**

| Medication knowledge  | Yes<br>No. (%) | No<br>No. (%) | No idea<br>No. (%) |
|---|----------------|---------------|--------------------|
| Tablets are same as insulin   | 25 (27.5)      | 35 (38.5)     | 31 (34.1)          |
| Complications are caused by insulin and tablets if used for long time | 18 (19.8)      | 22 (24.2)     | 50 (54.9)          |
| Tablets use is more effective than insulin                            | 23 (25.3)      | 33 (36.3)     | 32 (35.2)          |
| Vitamins are essential for diabetes                                   | 47 (51.6)      | 15 (16.5)     | 22 (24.2)          |
| Medication should be stopped during inter-current illness             | 1 (1.1)        | 62 (68.0)     | 28 (30.8)          |
| Medications can cause habituation                                     | 18 (19.8)      | 31 (34.1)     | 41 (45.1)          |
| Efficacy of medications depend on the cost of drug                    | 5 (5.5)        | 45 (49.5)     | 40 (44.0)          |

**Table 4: Use of herbs for management of diabetes mellitus**

| Herbal knowledge  | Yes -<br>No. (%) | No<br>No. (%) | No idea<br>No. (%) |
|---|------------------|---------------|--------------------|
| Herbal therapy is more effective and safe than modern medications | 7 (7.7%)         | 54 (59.3%)    | 30 (33%)           |
| Healer management is good for control Diabetes                    | 8 (8.8%)         | 44 (48.4%)    | 39 (42.9%)         |
| <i>Nigella Sativa</i>   | 21 (23.1%)       | 33 (36.3%)    | 37 (40.7%)         |
| <i>Punica granatum</i>  | 20 (22%)         | 17 (18.7%)    | 51 (56%)           |
| <i>Aloe vera</i>  | 23 (25.3%)       | 19 (20.9%)    | 48 (52%)           |
| <i>Ferula foetid</i>  | 12 (13.2%)       | 29 (31.9%)    | 49 (53.8%)         |
| <i>Pistacia terpinthus</i>  | 15 (16.5%)       | 31 (34.1%)    | 43 (47.3%)         |
| <i>Securigera secredaca</i>                                       | 9 (9.9%)         | 61 (67%)      | 21 (23.1%)         |
| <i>Lupinus albus</i>  | 29 (31.9%)       | 24 (26.4%)    | 38 (41.8%)         |
| <i>Commiphora molmol</i>  | 21 (23.1%)       | 24 (26.4%)    | 46 (50.5%)         |
| <i>Artemisia inculata</i>   | 15 (16.5%)       | 23 (25.3%)    | 52 (57.1%)         |
| <i>Allium cepa</i>  | 40 (44%)         | 11 (12.1%)    | 39 (42.9%)         |
| <i>Allium sativum</i>   | 29 (31.9%)       | 18 (19.8%)    | 43 (47%)           |
| <i>Mordeum vulgare</i>  | 17 (18.7%)       | 22 (24.4%)    | 50 (54.9%)         |
| Prescription of Raess Mahakem Tabook                              | 5 (5.5%)         | 70 (76.9%)    | 16 (17.6%)         |

vera, Liliaceae (Saber), 23.1% *Nigella Sativa*, Ranunculaceae (Habba Sawda), 23.1% *Commiphora molmol*, Burseraceae (Morrah), 22% *Punica granatum*, Punicaceae (Roman qesher) and 18.7% *Mordeum vulgarel*, Gramineae (Shaer).

A higher proportion of the sample used other plants such as fresh onion (44%). Table 4 illustrates the pattern of herb use among the sample. Certain herbal prescriptions were found to be used among (27%) of the population of this study. These prescriptions were mainly mixtures of two or more of the common herbs.

The results showed that only 14.3% had normal weight, 78% were overweight and obese, and 7.7% were severely obese.

## DISCUSSION

The sample examined in this study was Saudi female diabetic patients working mainly in governmental teaching sector. About three-quarters of them were middle-aged, very productive and at their peak of their professional careers. Their education varied from average to high. They were expected to be knowledgeable about their main health problem (diabetes). The results of this study showed that their understanding of diabetes was inadequate. Their knowledge of the symptoms of hypoglycemia was deficient. This seems to be a universal finding.<sup>18-21</sup>

This study also showed that half of the sample claimed to be very compliant with the medication regimen. This result seems better than that found in other studies where the adherence to oral hypoglycemic treatment was reported to be low, and about two-thirds of patients with Type 2 diabetes did not regularly take their oral hypoglycemic treatment.<sup>22</sup> However, this result has to be taken with caution since it depended on patient recall.

Knowledge on medication was low. Only about one-third of the sample were aware that different antidiabetic medications had the same purpose; that tablets were as equally effective as insulin. Some believed that antidiabetic medication could cause complications and habituation on long use. In support of the pharmacist's role, the British Diabetic Association is aware that many patients with diabetes do not cope adequately with their disease because of the lack of knowledge. This is especially true of elderly patients. Although all patients with

diabetes can benefit from education and regular updating, it is important for them to have some knowledge about their medication and, in particular, understand the causes of hypoglycemia and how to prevent them.<sup>14</sup> Other reports stated that improving patient knowledge could improve diabetes control.<sup>13,23</sup>

As shown in the results, family history of diabetes was positive in 86% of the cases, so providing education to this sample will certainly be beneficial to all family members suffering from the same disease.

The past 30 years have seen a revival in use of natural medicines in developed countries, and the use of medicinal herbs is still an important area of medical treatment in many developing and third world countries. One of the major reasons cited for the increase in the use of natural medicines is the growing awareness of the side effects of synthetic chemical drugs.<sup>24</sup>

Though belief does not always agree with practice, less than one-tenth of the study sample agreed that herbal therapy was more effective and safer than conventional medication. Twenty-seven percent of the sample of this study actually used some kind of herb for treatment or management of diabetes mellitus (either individually or in a mixed selection of herbs).

The use of herbs amongst the sample of this study reflects a trend observed in adult Saudis. In a study performed in the Northern Province of Saudi Arabia, it was revealed that 24% of primary health care consumers used herbs despite the availability and easy access to modern pharmaceutical medicine.<sup>25</sup> Our study shows a basic lack of awareness among female diabetics of the possible problems with the use of herbal remedies. The pharmacist can advise on drug-herb interaction and the dangers associated with the use of some herbal medicines.<sup>26</sup> Consumers need, more than ever, the pharmacist's expertise and counseling on how to self-select safe and effective herbal remedies and the sensible use of herbs as alternative therapies.<sup>27</sup>

It was evident from the study that though about 87% of the sample responded that obesity was not a sign of good health, about 78% were overweight and obese. This finding is similar to King's study,<sup>1</sup> which stated that more than 80% of the cases of Type 2 diabetes were associated with obesity. Studies reported that obesity might be the

precipitating factor in the development of DM.<sup>3</sup> The high prevalence of Type 2 diabetes is consistently associated with a high prevalence of obesity in Arab societies.<sup>2</sup>

The World Health Organization trials and population studies have shown that prevention was possible. Certain studies estimate that up to 90% of Type 2 diabetes could be avoided through lifestyle changes such as healthy eating, maintenance of normal weight, and regular exercise.<sup>28</sup>

Only one-fourth of the patients complied with the diet and only about 5% of them did regular exercise. The socio-cultural tradition in Saudi Arabia is that of a conservative community, in which women are over-protected and their permitted outdoor activities precludes exercise. In addition, the hot climate also interferes with outdoor activities.<sup>29</sup>

Diabetes mellitus has been cited as a model disease in which health education could make a significant difference.<sup>30</sup> As has been shown in this study, health education is needed to give this sample a certain understanding of the disease, an awareness of the importance of compliance with medication, diet and exercise, weight control and the use of herbal preparations. This group comprised mainly school teachers in a community where diabetes mellitus is prevalent. Their thorough knowledge of this disease would be beneficial to themselves and qualify them as health educators. Education of the person with diabetes is the cornerstone of management. Without appropriate education, the desired therapy targets are difficult or even impossible to achieve. People with diabetes should be encouraged and empowered to participate actively in managing and monitoring their condition.

## CONCLUSION

This study highlighted important deficiencies in the knowledge of diabetes mellitus. Health education is one of the areas which need to be addressed immediately. An awareness program to include lectures, workshops, and home blood glucose monitoring are essential skills needed for long-term glycemic control.

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