

# Sociodemographic determinants of management behaviour of diabetic patients. Part I. Behaviour of patients in relation to management of their disease

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المحددات الاجتماعية الديمغرافية للسلوك العلاجي لمرضى السكري المزمنين على إحدى عيادات السكري. الجزء الأول - سلوكيات المرضى بالنسبة لمعالجة مرضهم  
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خلاصة: تمنا بدراسة سلوكيات 300 من مرضى السكري المختارين عشوائياً فيما يتعلق بمعالجة مرضهم. وتبين أن معظم المرضى كانوا على درجة متميزة من الالتزام بالفحوص الدورية المنتظمة (97.0%)، وتحري مستويات السكر في البول والدم (94.3% و 96.0% على التوالي)، وتناول الأدوية الموصوفة (78.3%) وتدابير العناية بأقدامهم (75.0%). ومن ناحية أخرى فقد كان الالتزام ضعيفاً بين 35.3% فيما يتعلق بقياس ضغط الدم، وبين 39.0% فيما يتعلق بمراقبة الوزن. وفيما بين المدخنين، توقف 30.2% عن التدخين، وخفض 42.2% من حجم التدخين، بعد تشخيص المرض. أما الاعتدال للنفط الغذائي فقد كان مقبولاً أو مقبولاً من قبل معظم المرضى.

**ABSTRACT** We studied 300 randomly chosen diabetic patients to assess their behaviours in relation to management of their disease. The majority had very good compliance with regular periodic check-ups (97.0%), urine and blood screening for sugar (94.3% and 96.0% respectively), adherence to the prescribed medicines (78.3%) and foot-care practices (75.0%). However, 35.3% and 39.0% had poor compliance with regard to checking their blood pressure and weight monitoring. Among smokers, 30.2% stopped smoking and 42.2% decreased the amount smoked after being diagnosed with the disease. Dietary compliance was either satisfactory or very good for most patients.

**Déterminants socio-démographiques du comportement de diabétiques venant en consultation de diabétologie à Alexandrie. Première partie: comportement des patients concernant la prise en charge de leur maladie**

**RESUME** Nous avons procédé à une étude sur 300 patients diabétiques choisis au hasard afin d'évaluer leur comportement concernant la prise en charge de leur maladie. La majorité avait une très bonne observance pour les contrôles périodiques réguliers (97,0%), la surveillance de la glycosurie et de la glycémie (94,3% et 96,0% respectivement), la prise des médicaments prescrits (78,3%) et les règles d'hygiène des pieds (75,0%). Toutefois, 35,3% et 39,0% étaient peu observants dans le contrôle de leur pression artérielle et la surveillance de leur poids. Chez les fumeurs, 30,2% avaient arrêté de fumer et 42,2% avaient réduit leur consommation de tabac à la suite du diagnostic de la maladie diabétique. L'observance diététique était soit satisfaisante soit très bonne pour la plupart des patients.

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## Introduction

Diabetes is a serious public health problem that threatens the quality of life of patients with the disease. It can lead to acute and chronic complications. It is a significant cause of disability and death in many countries [1]. Diabetes is an emerging clinical and public health problem [2]. It has been reported that 4.3% of the Egyptian population has been diagnosed as having diabetes [3,4] and the combined prevalence of diagnosed and undiagnosed diabetes for those under the age of 20 years has been estimated to be 9.3% [2].

Diabetes is a chronic disease of lifelong duration, and its management requires a fundamental change in the patient's lifestyle. A health care team that includes a physician, educator, dietician, and other health care professionals depending on the patient's specific health problems should provide effective treatment. The most important member of the diabetic care team is the patient. The success of long-term maintenance therapy for diabetes mellitus depends largely upon the patient's compliance with a therapeutic plan [5]. The aim of our study was to investigate behaviours of diabetic patients in relation to management of their disease.

## Subjects and methods

A cross-sectional descriptive approach was used where the target population was the diabetic patients attending one randomly selected diabetic clinic of the Health Insurance Organization (HIO) in Alexandria from 1 May to 31 July 1996. All diabetic patients attending the outpatient clinic during the study period constituted the basis of the sample. From this group, 300 diabetic patients were selected randomly.

Data were collected using an interview schedule. The treatment behaviours addressed included: compliance with dietary regimen, smoking cessation, physical activity, adherence to treatment regimen, periodic check-up (including eye examination and blood pressure measurements), periodic laboratory tests for glucose in blood and urine and self-care practices (foot care, skin care and weight monitoring). Treatment behaviours were classified as poor (less than 50% of steps carried out), satisfactory (50%–75%) and very good (more than 75% of steps carried out). Descriptive and analytic statistics were used and the 5% level was considered to be significant.

## Results

### General characteristics of the diabetic patients in the study

There were more males (52.3%) than females (47.7%). The ages ranged from 26 years to 85 years with a mean  $\pm$  standard deviation of  $56.2 \pm 9.55$  years. No statistical difference was observed between the mean age of male and female diabetic patients ( $t = 1.19$ ).

Less than one-third of the patients (29.3%) were illiterate and about a quarter (25.7%) could only read and write. Only 13.3% held a primary/preparatory education certificate, while 17.7% had secondary education and 14.0% were university graduates. Significant differences were observed between the education levels of males and females ( $\chi^2 = 39.32$ ,  $P < 0.01$ ). More females tended to be illiterate or had a secondary education, while males tended to have either a primary/preparatory or university education or were only able to read and write (Table 1).

The duration of diabetes ranged from 1 year to 45 years with a mean  $\pm$  standard

Table 1 Distribution of diabetic patients by gender and level of education

Level of education	Males (n = 157)		Females (n = 143)		Total (n = 300)		$\chi^2$ (P-value)
	No.	%	No.	%	No.	%	
Illiterate	24	15.3	64	44.8	88	29.3	39.32 (<0.01)
Read/write	51	32.5	26	18.2	77	25.7	
Primary/preparatory	30	19.1	10	7.0	40	13.3	
Secondary	25	15.9	28	19.6	53	17.7	
University	27	17.2	15	10.5	42	14.0	

deviation of  $9.25 \pm 7.46$  years and a median of 7.50 years.

### Behaviour of diabetic patients with regard to medical care

The majority of the diabetic patients (97.0%) were categorized as having a very good level of behaviour in relation to periodic medical check-ups (Table 2). A similar pattern was observed as regards urine sugar testing and blood sugar testing. Behaviour in relation to blood pressure measuring needs to be corrected as 35.3% of diabetic patients had poor behaviour (Table 2). The majority of patients (62.3%) exhibited poor behaviour with regard to having eye examinations.

### Behaviour of diabetic patients with regard to treatment regimens

More than three-quarters (78.3%) of the diabetic patients adhered well to the medical treatment prescribed and 20.0% adhered to it satisfactorily (Table 3). More than half (59.7%) of the patients were assessed as having very good behaviour with regard to dietary compliance. However, over one-third (34.7%) of the diabetic patients did not take any exercise and 42.3% considered their daily routine activities as sufficient physical exercise. We found that

Table 2 Distribution of the 300 diabetic patients by their seeking of medical care

Seeking medical care	No.	%	$\chi^2_{MH}$ (P-value)
<i>Medical check-up</i>			2.26 (0.133)
Poor	1	0.3	
Satisfactory	8	2.7	
Very good	291	97.0	
<i>Urine sugar test</i>			0.03 (0.859)
Poor	6	2.0	
Satisfactory	11	3.7	
Very good	283	94.3	
<i>Blood sugar test</i>			1.16 (0.281)
Poor	2	0.7	
Satisfactory	10	3.3	
Very good	288	96.0	
<i>Blood pressure measurement</i>			0.79 (0.374)
Poor	106	35.3	
Satisfactory	78	26.0	
Very good	116	38.7	
<i>Eye examination</i>			0.35 (0.551)
Poor	187	62.3	
Satisfactory	91	30.3	
Very good	22	7.3	

MH = Mantel-Haenzel

30.2% of patients had stopped smoking and 42.2% had reduced the number of cigarettes smoked per day.

**Table 3 Distribution of diabetic patients by their treatment behaviour**

Treatment behaviour	No.	%	$\chi^2_{MH}$ (P-value)
<i>Medication adherence</i>			
Poor	5	1.7	5.15 (0.023)*
Satisfactory	60	20.0	
Very good	235	78.3	
<i>Dietary compliance</i>			
Satisfactory	121	40.3	1.41 (0.234)
Very good	179	59.7	
<i>Exercise compliance</i>			
No exercise	104	34.7	0.07 (0.789)
Daily activities	127	42.3	
Sometimes	31	10.3	
Regularly	38	12.7	
<i>Smoking (n = 116)</i>			
Smoker	32	27.6	16.33 (0.000)*
Reduced smoking	49	42.2	
Stopped smoking	35	30.2	
<i>Foot-care practices</i>			
Poor	11	3.7	0.06 (0.803)
Satisfactory	64	21.3	
Very good	225	75.0	
<i>Weight monitoring</i>			
Poor	117	39.0	5.78 (0.016)*
Satisfactory	100	33.3	
Very good	83	27.7	

\*Significant at 5% level  
MH = Mantel-Haenszel

A large proportion of diabetic patients (39.0%) did not monitor their weight very well. Three-quarters of diabetic patients administered foot care very well, while 21.3% handled this in a satisfactory way.

## Discussion

The main objectives of management of diabetes mellitus are to improve the quality of life of patients so that they can have as normal a life as possible [6]. Successful man-

agement depends upon the extent to which a person's behaviour in terms of keeping appointments, taking medication and making lifestyle changes coincides with the medical advice given [7].

Our study indicates that the majority of diabetics (97.0%) periodically attended routine check-ups. Shama also reported high compliance with keeping appointments [8]. The two studies focused on insured patients. Compliance with keeping appointments is expected as health insurance clinics provide patients with free diabetic medications. It should be noted that results from monitoring the patient's condition can be used to assess the efficacy of therapy and the physician can plan future therapy accordingly [9,10].

We found that the majority of patients had their blood and urine tested for glucose (96.0% and 94.3% respectively). Hence, they complied with the recommendation of monitoring of their glycaemia status. A recent study indicated that the cost of urine testing kits was considered a barrier by nearly one-third of diabetic patients [8]. Only 9.2% of the patients interviewed in our study routinely tested their urine at home.

Hypertension is a known risk factor of macrovascular disease in diabetes [11,12]. Hence, diabetic patients should have their blood pressure checked routinely for prevention or early treatment of the disease [13]. The study indicated that only 38.7% periodically went for blood pressure assessment. One of the serious complications of diabetes is diabetic retinopathy, which is a leading cause of blindness and visual impairment [14,15]. Loss of vision from retinopathy can be prevented in the majority of patients provided that the condition is detected early [16]. The study found that 62.3% of diabetic patients did not attend eye screening. Health insurance personnel

should enforce the recommendation that diabetic patients have an annual dilated eye examination [14,15].

An important therapy in the management of diabetes is the use of medications [17]. Patients should be motivated to use the medications prescribed. We found that 78.3% of diabetics were classified as having very good behaviour regarding medication compliance. Shama reported the same trend [8]. All medications are given free of charge so it was expected that more patients would take them as prescribed. Kravitz et al. reported that 91.0% of their patients took medications as prescribed [18]. Anderson and Fitzgerald reported an even higher rate of compliance with medication regimen for pills and/or insulin [19].

Management of diabetes is not restricted to medications and monitoring blood glucose level. It also includes an adjustment of diet and amount of exercise [6]. Diet is considered the backbone of any treatment plan for diabetes mellitus [20]. Dietetic recommendations for patients with type 1 diabetes mellitus and type 2 diabetes mellitus are, in principle, the same [20]. The study indicated that 59.7% of patients complied very well with their prescribed diet. This may be explained by the long duration of illness; the average duration of the disease  $\pm$  standard deviation was  $9.25 \pm 7.46$  years and the median was 7.50 years. However, Glasgow et al. [21] and Shama [8] reported that patients with a longer history of diabetes were less adherent to their diet.

Exercise is another important part of managing diabetes because it improves insulin action in both types of the disease [22]. A regular programme of physical activity helps reduce body weight and decrease glucose intolerance and the occurrence of complications [23]. In spite of the importance of exercise, only 12.7% of our diabetic patients exercised regularly.

Shama also reported the poor performance of diabetic patients in this area [8]. This may be a reflection of the lifestyle of Egyptians. Patients need to understand that daily activities are not considered exercise [24]; 42.3% of our diabetic patients were of the opinion that their daily activities were a substitute to doing physical exercise.

Another risk factor for macrovascular complications is smoking. It has been reported that hypertension and smoking interact to increase the risk of diabetic complications including stroke and heart disease [12]. In our study, at the diagnosis of the disease, 38.7% of patients were smokers. After diagnosis, 42.2% reduced the number of cigarettes smoked and 27.6% continued to smoke as before.

Monitoring weight will indicate whether the diet and exercise programmes are successful or not. This is part of managing obesity [20]. Only 27.7% of our diabetic patients monitored their weight regularly.

Ulceration and amputation of the lower extremities are among the most serious complications of diabetes [25]. Several studies suggest that attention to foot care can lower the rate of extremity amputations by 44%–85% [25,26]. We found that 75.0% of diabetic patients administered foot care efficiently.

## Conclusions

From this study it is clear that there is a gap between what the patients should do and what they are actually doing in managing their diabetes. Moreover, the patients' level of effort was not uniform in all areas of managing the disease. It was very good in the areas of medical check-up and glucose monitoring. It was not very good in the areas of eye examination, exercise and dietary compliance. Also, patients should

attend more blood pressure screenings. Hence, it is recommended that every effort be made to initiate and promote behavioural change in people with diabetes. To achieve this, an appropriate patient education pro-

gramme should be planned. The present data could be used in developing behavioural objectives. However, further research is needed to reveal determinants of compliance behaviour.

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