

## **Behavior, Metabolic Control and Health-related Quality of Life in Diabetic Patients at Bandar Abbas Diabetic Clinic.**

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### **Abstract**

Diabetes is a chronic disease of lifelong duration, and its management requires a fundamental change in the patient's lifestyle. The aims of this study were to determine behaviors of diabetic patients in relation to management of their disease, assess metabolic control and health-related quality of life of them. The target population was type 2 diabetic patients and a cross-sectional approach was used. We studied 80 randomly chosen patients. To determine behaviors of patients, data was collected using an interview schedule. Metabolic control was assessed by measuring glycosylated hemoglobin (HBA1c), and health-related quality of life was measured by means of WHOQOL-BREF questionnaire. The majority of patients had good compliance with adherence to the prescribed medicines (65% always and 35% often) and foot care practices (82.5%). However, only 6.3% of them administered self-monitoring blood glucose and 38.8% complied with dietary regimen always. Among smokers, 13.8% stopped smoking after being diagnosed with the disease. The mean HBA1c in the whole patient group was  $9.25 \pm 1.06$  and it ranged from 6.9 to 12.9 and only 2.5% of them had optimum control. The mean rating of health-related quality of life in all scales varied between 55.67 and 63.75 (maximum score: 100). The highest rated mean score was for physical health and the lowest was for psychological. It is recommended that every effort be made to initiate and promote behavioral change and improve metabolic control in diabetic patients. To achieve this, an appropriate patient's education program should be planned and future research is needed to reveal determinants of compliance behavior and factors associated with metabolic control and health-related quality of life in diabetic patients.

**Keywords:** *Diabetes, Behavior, Metabolic control, Quality of life*

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### **Introduction**

In the 21st century, we see more globalization and industrialization, longer life spans and changes in lifestyles worldwide. A consequence of these changes will be shifts in the patterns of disease, with chronic diseases such as diabetes becoming more prevalent (1). It is now well recognized that diabetes is an epidemic disease in most countries that are undergoing socioeconomic transitions. An estimated 135 million people worldwide had been diagnosed as diabetes in 1995, and this number is expected to rise to at least 300 million by the year 2025 if successful strategies are not

implemented for its prevention and control (1, 2). The number of people with diabetes will increase by 42% (from 51 to 72 million) in industrialized countries between 1995 and 2025 and by 170% (from 84 to 228 million) in industrializing countries (1). In fact by 2025, approximately 75% of all persons with diabetes will be living in developing countries. Moreover, type 2 diabetes, the most common form, is affecting ever younger age groups, striking young adults and even adolescents (2). It has been reported that 2% of the Iranian population have diabetes and prevalence of diagnosed diabetes for those over the age of 30

years has been estimated to be 7.3% (3). Diabetes is a serious public health problem that threatens the quality of life. It can lead to acute and chronic complications. It is a significant cause of disability and death in many countries (4). People with chronic disease, such as type 2 diabetes, have to face many problems which may have an impact on their health-related quality of life (HRQOL) (5). Individuals with the disease have to make major lifestyle changes and learn to live with monitoring blood glucose, using multiple drugs and injections, and dealing with treatment and complications of the disease(1). 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 and good metabolic control for diabetes depends largely upon the patient's compliance with a therapeutic plan and a fundamental change in the patient's behavior (4). Moreover, one of the primary objectives in the treatment of chronic disease, such as diabetes, is the improvement of the patient's HRQOL (5). The aims of our study were to investigate behaviors of diabetic patients in relation to management of their disease, assess metabolic control and HRQOL and identify some factors associated with them at Bandar Abbas diabetic clinic.

## Materials and Methods

A cross-sectional approach was used where the target population was the type 2 diabetic patients attending at Bandar Abbas diabetic clinic which is located in Shahid Mohammadi hospital at Hormozgan University of medical sciences. Approximately, 1400 type 2 diabetes patients had been registered at this clinic (6) and from them, 80 patients were selected randomly.

**Behavior** In order to investigate behaviors of patients in relation to management of their

disease, data were collected using an interview schedule. The treatment behaviors addressed included: adherence to treatment regimen, self-monitoring blood glucose, compliance with dietary regimen, exercise, foot care, weight monitoring and smoking cessation.

**Metabolic control** Metabolic control was assessed by measuring glycosylated hemoglobin (HBA1c). HBA1c was measured by colorimetric method. According to this method in diabetic patients HBA1c<7.5 is optimum control, 7.6-9.5 is acceptable and >9.5 is poor control.

**HRQOL** WHO defines quality of life as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns (7). HRQOL was measured by means of WHOQOL-BREF questionnaire which contains 26 items having a range of 1-5. It also includes four domains: physical health, psychological, social relationships and environment. In each domain raw scores converted to transformed scores and the range of transformed scores is from 0 to 100 (7). This questionnaire was shown to be reliable before study.

**Statistical analysis** 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 females (58.8%) than males (41.2%). The ages ranged from 32 to 72 years with a mean± standard deviation of  $50.56 \pm 8.53$  years. About one-third of the patients (32.5%) were illiterate and more than one-third (37.5%) could only read and write. Only 13.8% had secondary school, 10% had high school and 6.3% were university graduates. The duration of diabetes ranged from less than 1 year to 20 years with a mean± standard deviation of  $5.82 \pm 4.78$  years. Over half (56.3%) of the subjects were

housewives. Diabetes was controlled 5% by diet only, 56.3% by pills and 38.8% by insulin.

**Behavior** About two-third (65%) of diabetic patients always adhered to treatment regimen. Only 5 subjects (6.3%) administered self-monitoring blood glucose and only 38.8% of them complied with dietary regimen. A quarter (25%) of them exercised regularly and 82.5% administered foot care. A large proportion of them (45%) did not monitor their weight. We found that only 13.8% of patients had stopped smoking (Table 1).

**Metabolic control** The mean HBA1c in the whole patient group was  $9.25 \pm 1.06$  and it ranged from 6.9 to 12.9. Only 2(2.5%) of the patients had optimum control, 55(68.8%) acceptable and 23(28.8%) poor control. There was no relationship between age and HBA1c ( $r=-.194$ ,  $P=.08$ ), age at diagnosis and HBA1c ( $r=-.193$ ,  $P=.08$ ) and diabetes duration and HBA1c( $r=.005$ ,  $P=.96$ ). The mean HBA1c in males and females was  $8.86 \pm .90$  and  $9.53 \pm 1.00$  respectively and there was significant difference between them ( $P<0.005$ ).

**HRQOL** In all scales the mean rating of HRQOL varied between 55.67 and 63.75(maximum score: 100). The highest rated mean score was for physical health while the lowest was for psychological (Table 2). There was no relationship between age, age at diagnosis, diabetes duration, HBA1c and all scales of HRQOL (Table 3). There was relationship between smoking and psychological health ( $P=.02$ ) and between smoking and environment ( $P=.003$ ). In these scales nonsmokers were better than smokers (Table 4). The mean of physical health in males was  $68.3 \pm 13.02$  while in females was  $60.5 \pm 16.51$  and there was significant difference between them ( $t=2.27$ ,  $P=.02$ ). Illiterate patients had worse quality of life than literate patients in all scales ( $P<0.05$ ).

**Table 1:** behavior of patients in relation to management of their diseases

Behavior	No	%
Adherence to treatment regimen		
Always	52	65
Often	28	35
Self-monitoring blood glucose		
Yes	5	6.3
No	75	93.7
Compliance with dietary regimen		
Always	31	38.8
Seldom	47	58.7
Never	2	2.5
Exercise		
Always	20	25
Seldom	33	41.2
Never	27	33.8
Foot care		
Yes	66	82.5
No	14	17.5
Weight monitoring		
Yes	44	55
No	36	45
Smoking		
Yes	22	27.5
No	58	72.5
Smoking at the diagnosis diabetes		
Yes	33	41.2
No	47	58.8
Total	80	100

**Table 2:** The mean rating of HRQOL scales in diabetic patients (maximum score: 100, n=80)

scales	mean	S.D.
Physical health	63.75	15.59
Psychological health	55.67	11.96
Social relations	61.65	15.73
Environment	56.48	10.16

**Table 3:** Correlation(r) of the health-related quality of life scales with some variables (Pearson correlation)

Scales r(p)	Age r(p)	Age at diagnosis r(p)	Duration r(p)	HBA1c r(p)
Physical health	.10(.34)	.203(.07)	-.178(.11)	-.143(.2)
Psychological	-.014(.9)	.017(.88)	-.055(.62)	.110(.33)
Social relations	-.016(.88)	-.043(.7)	.049(.66)	.004(.97)
Environment	-.075(.51)	.011(.9)	-.153(.17)	.108(.34)

**Table 4:** Compare means of HRQOL between smokers and nonsmokers

Scales	Smoking	N	Mean	t	p
Physical health	Yes	22	58.7 ± 13.6	-1.7	.07
	No	58	65.6 ± 15.9		
Psychological	Yes	22	50.6 ± 10.01	-2.3	.02
	No	58	57.5 ± 12.1		
Social relations	Yes	22	57.4 ± 15.1	-1.4	.13
	No	58	63.2 ± 15.7		
Environment	Yes	22	51.1 ± 6.9	-3.02	.003
	No	58	58.5 ± 10.4		

### Discussion

The main objectives of management of diabetes are to improve the quality of life of patients so that they can possibly have normal life. Successful management depends upon the extent to which a person's behaviors in terms of keeping appointments, taking medication and making lifestyle changes, coincides with the medical advice given(4). An important therapy in the management of diabetes is the use of medications. Patients should be motivated to use the medications prescribed. We found that 65% of diabetics always and 35% of them often adhered to treatment regimen. Kravitz reported that 91% of his patients took medication as prescribed (8). Anderson and Fitzgerald reported an even higher rate of compliance with medication regimen for pills and insulin (9). Only 6.3% of patients administered self-monitoring blood glucose and the cost of glucose testing kits was considered a barrier by most of patients. About 10% of diabetic patients at Esfahan administered self-

monitoring blood glucose (10). Management of diabetes is not restricted to medications and monitoring blood glucose level. It also includes an adjustment of diet and amount of exercise (11). The study indicated that only 38.8% of patients complied always with their prescribed diet. Kamel et al reported 59.7% of diabetic patients complied very well with their prescribed diet (4). Exercise is another important part of managing diabetes because it improves insulin action in both types of disease (type 1 and type 2). A regular programme of physical activity helps reduce body weight and decrease glucose intolerance and the occurrence of complications (11). In spite of the importance of exercise, only 25% of our diabetic patients exercised regularly. In another studies it has been reported the poor performance of diabetic patients in this area (4). Ulceration and amputation of the lower extremities are among the most serious complications of diabetes. Several studies suggest that attention to foot care can lower the

rate of extremity amputations by 44%-85% (11). We found that 82.5% of diabetic patients administered foot care. Kamel reported that 75% of diabetic patients administered foot care efficiently (4). Weight monitoring will indicate whether the diet and exercise programmes are successful or not. This is a part of managing obesity (11). In our study 55% of diabetic patients monitored their weight. Kamel reported that 27.7% of diabetic patients monitored their weight regularly (4). 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 (11). In our study, at the diagnosis of the disease 41.3% of patients were smokers. After diagnosis 13.8% of them stopped smoking and 27.5% continued to smoke as before. The mean HBA1c result for the total sample was 9.25 and only 2.5% of the patients had optimum control. Murtada found that patients with poor metabolic control were significantly younger and with shorter disease duration (12). In this study, it seems that younger patients had poor metabolic control than older ones, but there was no association between diabetes duration and metabolic control. Males had better metabolic control than females. Probably, physical activity and exercise in males was more than females. Wikblad found that better metabolic control had a favorable effect on HRQOL of diabetic patients (13). However, others suggested that the status and change in quality of life may not be dependent on specific differences related to the diabetes illness (14, 15). Murtada found that poorly controlled diabetic patients had better HRQOL than those with good control (12). In this study there was no relationship between metabolic control and HRQOL, however it seems that patients with better metabolic control had better physical health and patients with worse metabolic control had worse physical health. HRQOL among the patients is generally low. The mean rated score for

psychological health, for instance, in this study is 55.67. Several studies have suggested that HRQOL is not affected by the duration of diabetes(15,16), but Murtada found that patients who were diagnosed early in life had better quality of life compared to those who had the disease later in life(12). In this study there were no association between age, diabetes duration and HRQOL. Physical health in men was better than women. HRQOL was associated with education. Educated patients had better HRQOL in all scales; probably they had higher health information than illiterate patients. Another factor related to psychological health and environment was smoking. Nonsmokers had better HRQOL in these scales. It has been reported that smoking increase the risk of diabetic complications (4). 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 good in the areas of medication and foot care, but not good in dietary compliance, exercise, self-monitoring blood glucose, weight monitoring and smoking cessation. The rate of optimum metabolic control was low and also HRQOL among the patients was generally low. Hence, it is recommended that every effort be made to initiate and promote behavioral change and improve metabolic control in people with diabetes. To achieve this, an appropriate patient education program should be planned. The present data could be used in developing behavioral objectives. However, future research is needed to reveal determinants of compliance behavior and factors associated with metabolic control and HRQOL in diabetic patients.

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