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Quality of life of people with diabetes attending primary care health centres in Riyadh: bad control – good quality?

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ABSTRACT

Introduction The prevalence of diabetes has exceeded 23% in Saudi Arabia. We conducted a study to evaluate the quality of life among people with diabetes, in primary care in Riyadh city.

Method Data were collected from three primary healthcare centres from different geographical areas in Riyadh. Adult diabetic patient registers were reviewed. People with diabetes with regular follow-up were included in the study. Data could be obtained for 440 patients. Dartmouth Primary Care Cooperative Information Project/World Organization of Family Doctors (COOP/WONCA) charts were applied to each participant, evaluating quality of life.

Results Mean age of the participants was 54 years. Fifty-two percent had one or more co-morbidities. Age was significantly correlated with all dimensions of the life quality ($P < 0.05$) except feelings ($P > 0.05$). Number of children was negatively correlated with physical fitness ($P < 0.001$), daily activities ($P < 0.001$), changes in health ($P < 0.001$), and overall health ($P < 0.001$). Body mass index was correlated with feelings ($P = 0.036$) and changes in health ($P = 0.034$). Haemoglobin A_{1c} (HbA_{1c}) was correlated with physical fitness ($P < 0.001$) and changes in health ($P = 0.001$). Men had significantly better scores in physical fitness ($P < 0.001$), feelings ($P = 0.016$) and social activities ($P < 0.001$), but worse scores in overall health, when compared with women ($P = 0.001$). Men had significantly better glycaemic control when compared with women ($P < 0.001$).

Discussion Quality of life among people with diabetes attending primary healthcare facilities in Riyadh can be regarded as very good. The reason for poor scores in physical fitness may be due to the presence of co-morbidities or under-reporting. Facilities for physical exercise need to be established, and people with diabetes should be motivated to exercise regularly.

Keywords: diabetes mellitus, family medicine, primary care, quality of life, Saudi Arabia

How this fits in with quality in primary care

What do we know?
The prevalence of diabetes has exceeded 23% in Saudi Arabia. Little is known about the quality of life and its relationship with quality of care in this large group of patients.

What does this paper add?
Quality of life among people with diabetes attending primary healthcare facilities in Riyadh is good despite poor control of diabetes. The reason for poor scores in physical fitness may be due to the presence of co-morbidities or under-reporting. Facilities for physical exercise need to be established, and people with diabetes should be motivated to exercise regularly.

Introduction

Diabetes is an important cause of death, illness, and disability across the world. It is estimated that by 2010, 250 million people worldwide will suffer from diabetes.[1] Diabetes substantially increases the risk of blindness, renal diseases, coronary arterial disease, cerebrovascular disease, and peripheral vascular disease.[2–4]

Diabetes mellitus is becoming a major health problem in Saudi Arabia. Changes in the lifestyle of the population are implicated as an important factor in the increase in prevalence, which exceeded 23%.[5–9]

Diabetes care in Riyadh is provided by hospitals and also chronic disease clinics within primary care facilities. Owing to its high prevalence, priority in research is given to diabetes in the Kingdom of Saudi Arabia (KSA).[5,6,10–16] The progressive and debilitating nature of the disease may lead to impairment in many systems of the body, resulting in reduction in quality of life. However, health-related quality of life (HRQOL) in these patients is relatively less studied among people with diabetes in primary healthcare.

We decided to conduct a descriptive study to evaluate different aspects of diabetes care in the primary healthcare (PHC) centres in Riyadh, giving special attention to the perceived quality of life of the patients. Additionally, we investigated the association between HRQOL and diabetic control, presence of co-morbidities or demographic factors.

Methods

Riyadh is the capital city of KSA with around 4 million inhabitants.[17] There are 78 PHC centres in Riyadh city providing free health services to all.[18] Primary care physicians (mostly without a qualification in family medicine) run the chronic disease clinics in these centres. In this health system, all families have to be registered to a PHC centre. Thus, patients with diabetes are also expected to be followed up there. However, some patients prefer to be followed up by their specialists in the hospital. Although there are no data on the proportion of patients who do so, it is usually about 20% (authors' personal observations).

Three of the PHC centres in Riyadh were selected randomly, and nurses providing the diabetes care were invited to join the study. The selected centres were from different geographical areas, namely from south, east, and central Riyadh. The total number of registered persons for each centre was 38 165, 30 961 and 27 337 persons respectively. Out of these registered persons, the number of patients with diabetes for the south, east, and central area were 697, 731 and 685 persons respectively. In KSA, 59.9% of the population is aged 19 years or less.[19] The centres are divided into male and female sections and two to five practitioners serve in each section, together with a nurse experienced in diabetes care.

Data about the demographic characteristics of the patients, their medications and level of control of the disease were collected. Dartmouth Primary Care Cooperative Information Project/World Organization of Family Doctors (COOP/WONCA) charts were used as a tool to collect information on the main outcome (perceived HRQOL of the patients). These charts are developed by the WONCA Classification Committee in collaboration with the WONCA Research Committee.[20] The COOP/WONCA charts evaluate perceived HRQOL in six dimensions using a five-point Likert scale (1 = excellent, 5 = poor): physical fitness, feelings, daily activities, social activities, change in health and overall health. Average HRQOL scores were calculated by calculating the average scores of the six dimensions. Other outcomes measured were fasting blood glucose levels, haemoglobin A_{1c} (HbA_{1c}) levels, presence of any co-morbidity, and body mass index.

Adult diabetic patient registries in the selected health centres were reviewed. A list of all people with diabetes with active files (regular follow-up of at least three per year) was prepared. Twenty percent of the patients were sampled randomly from this list. Patients were interviewed in the health centres. The aim of the study

was explained to all participants followed by an oral consent. Care was given for data privacy, and personal information of the participants was not disclosed at any stage. Written permission was taken from the Ministry of Health, where ethical perspectives are also taken into account. Data could be obtained and analysed for 440 patients.

Power and sample size calculation was based on the HRQOL outcome (physical fitness dimension). Previous studies have shown mean physical fitness scores between 3.0 and 3.7 using the COOP/WONCA charts.[21–23] Taking the population standard deviation as 0.8 and the effect of interest as 7%, 338 patients were needed to reach a power of 90%. Student *t* test, Mann–Whitney *U* test, Chi square analysis, Spearman correlation and logistic regression analysis were used for the hypothesis testing. A *P* value of less than 0.05 was regarded as statistically significant.

Results

The mean age of the participants was 54.27 years (range 22–99 years); 55.2% of the participants were males; 72.4% had educational level of primary school or less; 91% of the females were housewives while 38% of the males were manual workers. Ninety-one percent of males and 62% of females were married (see Table 1).

Fifty-two percent had evidence of one or more co-morbidities (24.6% single co-morbidity, 8.7% two, 6.4% three, and 12.4% more than three co-morbidities). Cardiovascular co-morbidities constituted the highest number with 38.5%, whereas 37.4% of the patients had hypertension (see Table 1). All kinds of co-morbidities (including cardiovascular) were more common among females. The presence of cardiovascular, locomotor and psychosocial co-morbidities among males and females were 77 (31.7%) versus 92 (46.9%) (Chi square 10.659, $P < 0.001$); 24 (9.9) versus 78 (39.8) (Chi square 54.540, $P < 0.001$); and 5 (2.1) versus 60 (30.6) (Chi square 70.129, $P < 0.001$) respectively. The presence of any co-morbidity was associated with a limitation in the HRQOL (value 4 and 5 in any of the COOP/WONCA charts) ($P < 0.001$). Average HRQOL scores increased with increasing number of co-morbidities. Scores for 0 ($n = 205$), 1 ($n = 103$), 2 ($n = 34$), 3 ($n = 28$), 4 ($n = 19$), 5 ($n = 16$), and 6 and more ($n = 20$) co-morbidities were 1.89, 2.02, 2.35, 2.45, 2.61, 2.72 and 3.14 respectively. There was a significant positive correlation between the number of co-morbidities and all dimensions of HRQOL. Spearman correlation coefficient between the number of co-morbidities and average HRQOL scores was 0.456 ($P < 0.001$).

Table 1 Demographic features of the participants

Demographic feature	*n*	(%)
Sex		
Male	243	(55.2)
Female	197	(44.8)
Education		
Primary school or less	314	(72.3)
Intermediate	52	(12.0)
Secondary	49	(11.3)
University and above	19	(4.4)
Occupation		
Professional	60	(14.0)
Technical	9	(2.1)
Manual	96	(22.3)
Housewife	179	(41.6)
Retired	26	(6.1)
Student	4	(0.9)
Others	56	(13.0)
Marital status		
Single	25	(5.8)
Married	344	(80.0)
Divorced	20	(4.7)
Widowed	41	(9.5)
Number of children		
0	20	(5.7)
1–3	57	(16.3)
4–6	120	(34.3)
7–9	93	(26.6)
10 and more	60	(17.1)
BMI (kg/m^2)		
Below 25	86	(20.8)
25–29.9	175	(2.3)
30–39.9	134	(32.3)
40 and above	19	(4.6)
Presence of any co-morbidity		
Yes	210	(47.8)
No	229	(52.2)
Cardiovascular	169	(38.5)
Locomotor	102	(23.2)
Psychosocial	65	(14.8)
Other	84	(19.1)
HbA_{1c} (%)		
7 or less	21	(8.8)
7.1–8.0	32	(13.3)
8.1–9.0	21	(8.8)
>9.0	166	(69.2)

A total of 36.9% of the participants had a body mass index (BMI) of 30 kg/m^2 or more (males 29.3%, females 45.8%). The proportion of those with a BMI of 25 kg/m^2 or more was 79.2%. Females were significantly more obese when compared with males ($t = 4.18$); $P < 0.001$). Demographic features of the participants are presented in Table 1.

Average values for 'duration of diagnosed diabetes', 'last fasting blood glucose', and 'HbA$_{1c}$ levels' were 7.5 years (minimum 2 weeks, maximum 34 years), 189.9 mg/dl (range 36–619 mg/dl), and 11.0% (range 4.2–20%) respectively. The most commonly used drug therapy was a sulfonylurea (53.6%). Five percent were receiving non-pharmacological therapy (see Figure 1). Men had significantly better glycaemic control when compared with women (HbA$_{1c}$ values 10.2% versus 12.6%; $t = 8.545$; $P < 0.001$).

The lowest scores were on the physical fitness dimension of the HRQOL; 53.8% of the participants had some limitations in physical fitness (values 4 and 5 of the charts). There was a significant difference between males and females with regard to physical fitness (Chi square 74.199, $P < 0.001$); 35.1% of the males versus 76.5% of the females had some limitations in physical fitness. All other dimensions except changes in life had limitations less than 7% (value 4 and 5); 14.5% of the participants had worse health perception compared with 2 weeks ago (see Table 2).

Age was significantly correlated with all dimensions of HRQOL ($P < 0.05$; Spearman R for physical fitness, daily activities, social activities, changes in health, and overall health, –0.149, –0.248, –0.139, –0.125 and –0.224 respectively) except feelings ($P > 0.05$). Number of children was negatively correlated with physical fitness ($P < 0.001$; $R = –0.139$), daily activities ($P < 0.001$; $R = 0.199$), changes in health ($P < 0.001$; $R = 0.238$), and overall health ($P < 0.001$; $R = 0.150$; the data were controlled for sex during this analysis). Body mass index was negatively correlated with feelings ($P = 0.036$; $R = –0.104$) and changes in health ($P = 0.034$;

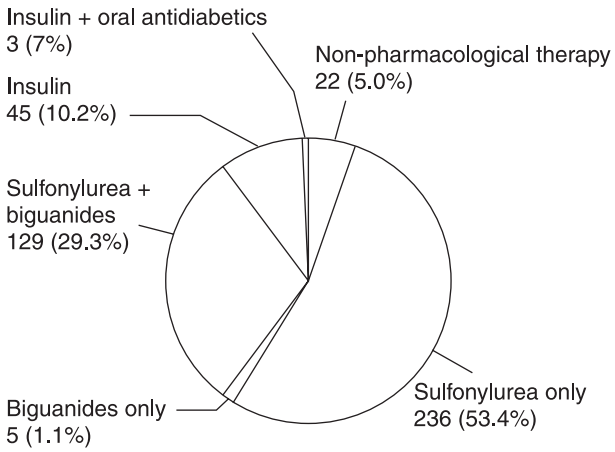

Figure 1 Distribution of different treatment modalities

Table 2 HRQOL in different dimensions of the COOP/WONCA charts

Score	Physical fitness		Feelings		Daily activities		Social activities		Changes in health		Overall health	
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)	*n*	(%)
1	66	(15.2)	282	(65.1)	268	(61.7)	300	(69.1)	116	(26.8)	101	(23.4)
2	53	(12.2)	79	(18.3)	88	(20.3)	88	(20.3)	137	(31.7)	149	(34.5)
3	82	(18.8)	41	(9.5)	49	(11.3)	29	(6.7)	117	(27.0)	166	(38.4)
4	118	(27.1)	14	(3.2)	12	(2.8)	7	(1.6)	59	(13.6)	15	(3.5)
5	116	(26.7)	17	(3.9)	17	(3.9)	10	(2.3)	4	(0.9)	1	(0.2)
Total	435	(100)	433	(100)	434	(100)	434	(100)	433	(100)	432	(100)

$R = -0.105$). HbA_{1c} was correlated with physical fitness ($P < 0.001$; $R = -0.309$) and changes in health ($P = 0.001$; $R = 0.220$).

Males had significantly better scores in physical fitness ($z = -9.848$; $P < 0.001$), feelings ($z = -2.418$; $P = 0.016$) and social activities ($z = -5.034$; $P < 0.001$) but worse scores in the overall health, when compared with females ($z = -3.463$; $P = 0.001$).

A logistic regression model was developed to check for factors affecting the presence of any kind of limitations in the HRQOL (values 4 and 5 of the charts). Age, sex and presence of any co-morbidity were significantly related with limitation (see Table 3). This model could predict HRQOL limitations with a sensitivity of 75.0% and a specificity of 83.8%, explaining 47.1% of the variability in HRQOL. Adding the variables BMI, duration of diagnosed diabetes, fasting blood glucose levels, and marital status to this model did not change the significance.

Discussion

This study demonstrated different aspects of diabetic care in the primary care facilities in Riyadh. We evaluated data in four aspects: the treatment modalities used, the level of diabetic control, presence of co-morbidities, and perceived quality of life from the patients' perspective. Outcomes were compared with demographic factors.

Oral antidiabetic agents are worldwide the most commonly utilised medicine for diabetes. In a previous study from a hospital-based family practice centre in Riyadh, oral antidiabetic use was reported as 49%.[24] Our patient population is from community-based PHC centres. Non-pharmacological therapies could be expected to be more in PHC. However, none of the participating centres to this study had a dietician on their staff.

Oral medication alternatives for diabetes are advancing very rapidly. Biguanides are worldwide still the most commonly utilised agents.[25] Our findings show a contradiction with the guidelines in this manner. The main reason for this is likely to be a lack of up-to-date knowledge among the practitioners. There are so far no updated local guidelines for the treatment of diabetes in KSA. The early side-effects with biguanides may play a role as well. However, patients as well as doctors probably consider the main outcome in therapy as lowering the blood glucose, which is achieved more easily with sulfonylureas. In KSA, basic medicine is freely provided to the PHC centres by the government. However, from time to time problems are experienced in supplying biguanides. This shortage may have effected the prescribing behaviours of the practitioners as well.

Diabetic control was not satisfactory from both fasting blood glucose and HbA_{1c} perspectives. Poor glycaemic control values of 44–49% have also been reported by Azab.[26] Furthermore, Khattab *et al* report similar results: 54.3% of people with diabetes from primary care in Abha were found to have fasting blood glucose levels of 140 mg/dl or more.[15] Inadequate compliance might be an explanation of this finding. Adherence to therapy is a well-known problem in chronic diseases. A lack of proper team care and qualified physicians in the care of people with diabetes might contribute to this. Since symptoms are not as drastic until complications ensue, patients may not be able to recognise the importance of the disease and give attention to the professional suggestions. Whatever the reason, it is the duty of medical professionals to increase awareness among patients and adjust treatment protocols accordingly. Combination drug therapies were common, affecting 30% in our study compared with the 26% reported by Al-Shammari *et al*.[27] Knowledge of diabetes amongst patients (which was not evaluated in our study) is also an important factor affecting treatment outcomes.[28] There seemed to be a need to revise the treatment protocols applied by primary care doctors, which in turn will raise the need for postgraduate training of the primary care doctors.

Women in our study had more co-morbidities. Even cardiovascular co-morbidities were found to be more common among women. This finding may

Table 3 Computer output of the logistic regression model predicting limitations in HRQOL

	B	SE	Wald	*P* value	Odds ratio
Age	0.041	0.011	13.679	0.00	1.04
Sex (1 = male, 2 = female)	2.97	0.32	88.38	0.00	19.46
Presence of co-morbidity (0 = no, 1 = yes)	1.09	0.26	17.85	0.00	2.96
Constant	–1.26	0.59	4.46	0.035	0.29

B = logistic regression coefficient; SE = standard error.

be related to there being fewer exercise facilities for women. The strong relationship between co-morbidities and the HRQOL leads to a lower perceived quality of life among females. Locomotor and psychosocial problems tend to be more common among females; however, cardiovascular problems are known to be more common among males.[29] The relatively high cardiovascular co-morbidities in this population need further clarification by evaluating the cardiovascular risk factors.

The illness burden experienced by individuals with diabetes was not only associated with diabetes itself, but also with co-morbid medical conditions. This issue was addressed by several other researchers. Cardiovascular morbidity,[30–32] obesity,[33,34] and arthritis[35] were found to be associated with lower HRQOL scores. While Mena Martin *et al* found an association between poor glycaemic control and HRQOL,[33] other researchers claim that intensive glucose control does not have any effect on HRQOL.[34,36] However, there is an agreement that co-morbid conditions have a significant impact on HRQOL rather than diabetes itself. In this regard, our findings of a positive correlation between HRQOL scores and the number of co-morbidities seems to be a new contribution to the literature.

Despite the relatively poor glycaemic control and the presence of co-morbidities in more than half of the population, perceived quality of life among the study population was high. People with diabetes tend to have a worse quality of life than those with no chronic illness, but a better quality of life than people with most other serious chronic diseases.[35] It is known that spiritual practices are changing the perceptions related to health conditions.[37] Gratitude to the Creator, whatever the circumstances, is an important feature of Islam.[38] It is possible that limitations in the emotional dimensions of the HRQOL are under-reported due to religious and cultural beliefs (physical fitness is a more objective factor and thus probably less affected by attitudes towards disease), which needs to be confirmed by further studies.

Gender on the other hand has been shown not to be related with HRQOL in western countries.[39] However, in our study, gender was the most important factor affecting HRQOL with an odds ratio of 19, followed by the presence of co-morbidity with an odds ratio of 3. This difference may be due to different lifestyles of Saudi women. As part of respectable community behaviour, Saudi women are bound mainly to their houses, which leads to different eating and exercise habits than males. The high obesity rate among women might be a factor leading to physical limitations. However, further studies are needed to evaluate the reasons for physical fitness limitations among women, as well as different exercise and nutrition behaviours and barriers to these.

Co-morbidities and the relatively older age of the study population may also have contributed to physical fitness scores. Facilities for exercising need to be established, and people with diabetes could be motivated to exercise.

Ethnicity of patients was not recorded in this study. Large-scale studies showing the ethnicity of patients could yield more information. Another limitation of our study was its cross-sectional nature. A repeated cross-sectional study investigating the changes in HRQOL after correcting factors such as glycaemic control or BMI could yield much more important information.

Conclusion

Owing to its chronic nature and inevitable long-term complications, diabetes becomes an emotionally as well as physically restrictive disease. As a result, significant decreases in life quality are expected. However, the quality of life among people with diabetes attending primary healthcare facilities in Riyadh has been found to be very good in general. Limitations could only be found in physical fitness. However, the significantly poor diabetic control among these patients, and deteriorations in health with time as depicted by the 'changes in health' dimension of the COOP/WONCA charts are worrying. Since women seem to be more affected in terms of quality of life, new interventions should focus more on this group. Exercise facilities and educational programmes for women with diabetes could reverse this imbalance.

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CONFLICTS OF INTEREST

None.

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