Evaluation of the health-related quality of life of Emirati people with diabetes: integration of sociodemographic and disease-related variables

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تقييم جودة الحياة الصحية للإماراتيين المصابين بمرض السكري: تكامل المتغيرات الاجتماعية الديموغرافية والمتغيِّرات المرضية

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الخلاصة: تهدف هذه الدراسة إلى تقييم الحياة الصحية للإماراتيين المصابين بمرض السكري، واستكشاف المتغيرات الاجتماعية الديموغرافية والمتغيِّرات المرضية التي تؤثر عليها. وقد استخدمت الباحثة النسخة الموجزة من النسخة العربية لاستبيان منظمة الصحة العالمية حول جودة الحياة الصحية، وزَّعتها على مئتَيْن من السكريِّين. وبلغ متوسط الـحَرَز الإجمالي 63.1 ± 15.0، مُتَراوحاً بين 61.5 وبين 65.5 وفق المقاييس الفرعية. وقد أثرت ثلاثة عوامل بدرجة يُعْتَدُّ بها إحصائياً على الـحَرَز الإجمالي لاستبيان جودة الحياة الصحية وهي: وجود مضاعفات السكري، ومدة الإصابة بالسكري، والحالة العائلية. ومَثَّلَ وجود المضاعفات أقوى المتغيرات التي أثرت على أربعة مجالات في استبيان جودة الحياة الصحية، ولاسيّما المجال البدني. في حين لم تؤثر مدة الإصابة بالسكري على المجال النفسي، ولم تؤثر الحالة العائلية على المجالين البدني والنفسي. وقد قدَّمت هذه الدراسة بيِّنة إضافيَّة على فائدة وموثوقية النسخة العربية الموجزة من استبيان جودة الحياة الصحية.

ABSTRACT This study aimed to evaluate the health-related quality of life (HRQOL) of Emirati people with diabetes and to explore the sociodemographic and disease-related variables affecting it. The Arabic version of the World Health Organization quality of life questionnaire, short version (WHOQOL-BREF) was administered to 200 people with diabetes. The overall mean score was 63.1 (SD 15.0), ranging from 61.5 to 65.5 on subscales. Three factors significantly influenced the total HRQOL: presence of diabetes complications, duration of diabetes and marital status. Presence of complications was the most powerful variable influencing the 4 domains of HRQOL, especially the physical domain. Duration of diabetes did not influence the psychological domain and marital status did not influence the physical and psychological domains. The study provides further evidence of the usefulness and reliability of the Arabic WHOQOL-BREF.

Évaluation de la qualité de vie liée à la santé des Émiriens atteints de diabète : intégration des variables sociodémographiques et liées à la morbidité

RÉSUMÉ La présente étude visait à évaluer la qualité de vie liée à la santé des ressortissants des Émirats arabes unis souffrant de diabète et à rechercher les variables sociodémographiques et liées à la morbidité qui ont une influence en la matière. La version en langue arabe du questionnaire sur la qualité de vie de l'Organisation mondiale de la Santé, dans sa version abrégée (WHOQOL-BREF) a été administrée à 200 personnes atteintes de diabète. Le score global moyen était 63,1 (E.T. 15,0), et était compris entre 61,5 à 65,5 pour les sous-échelles. Trois facteurs ont nettement influé le score total au questionnaire : la présence de complications dues au diabète, la durée de la pathologie et la situation matrimoniale. La présence de complications était la variable la plus puissante ayant des répercussions sur les quatre domaines du questionnaire, en particulier le domaine physique. La durée du diabète n'avait pas de conséquence sur le domaine psychologique et la situation matrimoniale n'avait pas d'effet sur les domaines physiques et psychologiques. L'étude a confirmé l'utilité et la fiabilité de la version en langue arabe du questionnaire WHOQOL-BREF.

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Introduction

Diabetes is a chronic disease and is a public health concern worldwide. According to the International Diabetes Federation, 171 million people worldwide are suffering from the disease [1]. In the United Arab Emirates (UAE), like other parts of the world, the prevalence of diabetes is rising dramatically. The UAE ranks second highest worldwide for the prevalence of diabetes and the disease accounts for 75% of deaths among UAE nationals [2]. An estimated 20% of UAE nationals have diabetes and that figure is expected to rise to epidemic proportions with the adoption of modern lifestyles and an increase in lifespan [2].

The burdens associated with diabetes, such as anxiety, regimented lifestyle and long-term complications have prompted researchers and clinicians to examine the impact of the disease on the health-related quality of life (HRQOL) of people with diabetes. Several studies have demonstrated that diabetes has a negative influence on the overall HRQOL and its domains of physical, psychological and social relationships and environment [3–12].

Although diabetes is widely known to have a dramatic effect on the HRQOL of people with the disease, the concept of HRQOL is subjective and influenced by both individual and disease-specific variables [5–7,10,11]. Sociodemographic variables such as sex [5–8,12,13], age, marital status [5,7,13], income [7], education [7,9,14], and disease-related variables such as type [3,5,11] and duration of diabetes [3,5,12] and presence of complications of diabetes [3,5,12] can influence the perceptions of HRQOL among people with diabetes.

Measuring HRQOL and identifying the variables affecting it are crucial to guide health care professionals towards intervention strategies tailored to improving the HRQOL of patients with diabetes. This study therefore aimed to fill the gap in knowledge about HRQOL of people with diabetes in the UAE culture and opens the door for future international collaborative research in diabetes.

Methods

Sample

Data were collected over a period of 6 months from February 2009 to July 2009 from 200 people with diabetes attending 4 primary health care centres and 4 diabetes clinics across the UAE. Data were collected from 5 main cities: Abu Dhabi (the capital), Dubai, Sharjah, Ajman and Ras al-Khaima. Two cities, Umm al-Qaiwain and Fujairah, were not accessible for data collection. The sample size was determined based on a review of similar research studies [6,7,13,14], as recommended by Bartlett et al. [15].

Participants were all people attending the selected clinics over the study period who met the study criteria. The inclusion criteria required that subjects were older than 20 years, competent in Arabic language and had been diagnosed with diabetes mellitus either type 1 (insulin treatment) or type 2 (oral hypoglycaemic agents) more than 6 months before the date of participation in the study. Participation in the study was limited to UAE nationals. People with any illness or chronic disease that did not clearly relate to diabetes were excluded from the study. Those who were known to have suffered a major traumatic event at least 6 months prior to data collection, such as divorce, separation or death of someone close, were excluded from the study as such events could negatively influence their HRQOL.

Informed consent was obtained from all subjects to ensure voluntary participation in the study. Ethical approval for the current study was obtained from the local institutional review board at University of Sharjah.

Data collection

To ensure a rigorous research process, 5 trained research staff conducted face-to-face interviews with all the people approached who agreed to participate in the study and who met the study inclusion/exclusion criteria.

HRQOL was assessed using the Arabic translation of the World Health Organization (WHO) quality of life questionnaire, short version (WHO-QOL-BREF). The Arabic version of WHO-HRQOL is an exact translation of the English version that was developed by the WHO-QOL group [16]. The original instrument was developed to provide a quick assessment tool for HRQOL which refers to health-related functioning in all domains of health [16]. Permission to use the Arabic translation of the instrument was obtained from WHO.

The WHOQOL-BREF is a 26-item self-report instrument, scored on a 5-point Likert-type scale ranging from 1 (strongly agree) to 5 (strongly disagree), with the highest scores representing better HRQOL. There are 4 subscales within the instrument which measure the 4 domains of HRQOL: physical (e.g. body pain), psychological (e.g. self-esteem), social relationships (e.g. social support), and environment (e.g. physical safety). The sum of the responses to each of the subscales provides a score for the overall HRQOL. Raw scores on 4 domains were calculated by adding the values of single items and transformed on a scale ranging from 0–100, where 100 is the highest and 0 is the lowest HRQOL [17]. In order to allow meaningful interpretations of the final scores for the total scale and for subscales, the researchers reviewed studies that have used the WHOQOL-BREF to assess HRQOL within diabetes populations [3,7,18,19]. The following values of scores were extracted from the reviewed studies and were applied in the current study: score ≤ 45, poor or bad HRQOL; score < 45–65, moderate HRQOL; and score > 65, relatively high HRQOL.

The Arabic version of the WHO-QOL-BREF has been used among people with diabetes and found to have adequate psychometric properties [7]. Internal consistency reliability on the subscales (Cronbach alpha) was 0.95 for the physical subscale, 0.94 for the psychological subscale, 0.85 for the environment subscale and 0.60 for the social relationship subscale [7]. Researchers have found that the item of sexual life satisfaction on the social relationship subscale demonstrated the lowest mean score compared with other items and this decreased the internal consistency reliability of this subscale; however, the subscale was retained in this study to maintain standardization of the instrument with other studies [7].

Additional questions recorded information on the sociodemographic variables of subjects: sex, age, marital status, education, income and disease-related variables including type and duration of diabetes and presence of at least 1 complication from diabetes such as foot, eye, cardiac or kidney diseases. Average income was estimated by participants' self-report in 3 categories: "below average," "within average," and "less than average".

Statistical analysis

Statistical analysis was performed using *SPSS*, version 17.0. Descriptive statistics— percentages and mean, range and standard deviation (SD) scores—were calculated for all study variables. Statistical significance was set at $P > 0.05$.

Standard multiple regressions (enter method) was applied to investigate the effect of the independent variables—sociodemographic (sex, age, marital status, income, education) and disease-related variables (type, duration and complications of diabetes)—on the HRQOL and its 4 domains (physical, psychological, social and environment). The enter approach is recommended as the safest type of regression model when no theoretical model has been described [20]. The multicollinearity problem was assessed using collinearity diagnostic factors [tolerance and the variance inflation factor (VIF)]. A tolerance of < 0.20 or 0.10 and/or a VIF ≥ 10 indicates a multicollinearity problem which requires the variable to be removed from the model [21]. No multicollinearity problems were found among the independent variables in this study and therefore all variables were entered into the regression model.

Results

Description of the sample

A total of 200 subjects with diabetes participated in the study (62 from Abu-Dhabi, 38 from Dubai, 30 from Sharjah, 30 from Ajman and 40 from Ras al-Khaima). The sociodemographic and disease-related characteristics of the 200 subjects are presented in Table 1. The mean age of participants was 45.0 (SD 12.4) years. More females participated in the study (55.5%), a majority of the subjects were married (72.0%) and half had an average level of income (52.0%).

As illustrated in Table 2, more participants had type 2 diabetes than type 1; 18.0% of people reported having diabetes for > 15 years and more than half (55.5%) had at least 1 complication of diabetes such as foot, eye, heart or kidney problems.

Factors influencing health-related quality of life

The total mean score for the overall HRQOL was 63.1 (SD 15.0). The highest mean subscale scores were for the social relationship [65.5 (SD 17.1)] and the environment domains [63.4 (SD 15.0)]; mean scores were lower for the physical [61.8 (SD 14.3)] and psychological [61.5 (SD 13.7)] domains.

Results of the regression analysis revealed that sociodemographic and disease-related variables together affected

Table 1 Sociodemographic characteristics of the study participants (n = 200)

Variable	No.	%
Sex		
Male	89	44.5
Female	111	55.5
Age (years)		
< 30	32	16.0
31–39	30	15.0
40–49	61	30.5
50–65	77	38.5
Level of education		
None	63	31.5
Primary	42	21.0
Secondary	31	15.5
High school	44	22.0
Graduate school	20	10.0
Marital status		
Single	29	14.5
Married	144	72.0
Widowed or divorced	27	13.5
Monthly income		
Below average	32	16.0
Within average	104	52.0
Above average	64	32.0

Table 2 Disease-specific characteristics of the study participants (*n* = 200)

Variable	No.	%
Type of diabetes		
Type 1	75	37.5
Type 2	125	62.5
Duration of diabetes (years)		
< 5	88	44.0
6–10	44	22.0
11–15	32	16.0
> 15	36	18.0
Presence of diabetes complications		
Yes	111	55.5
No	89	44.5

the total HRQOL and accounted for 0.15% of the variance in total HRQOL [$F(8,198) = 4.17$, $P = 0.001$]. However, the resulting beta weights indicated that only marital status, complications of diabetes and duration of diabetes significantly influenced the total HRQOL of subjects with diabetes (Table 3).

Sociodemographic and disease-related variables also influenced the domains of HRQOL. The regression correlation coefficients (R^2) were significant for all domains (Table 3). Beta-values showed that the 3 variables that influenced the total HRQOL (presence of complications, duration of diabetes and marital status) also significantly influenced the domains of HRQOL. Presence of complications was the most powerful variable influencing all 4 domains of HRQOL, especially the physical domain. Duration of diabetes did not influence the psychological domain and marital status did not influence the physical or psychological domains of HRQOL.

Psychometric properties of the WHOQOL-BREF

The Arabic version of the WHOQOL-BREF demonstrated good psychometric properties in this study. The internal consistency reliability (Cronbach alpha) for the total scale was 0.85, for the physical domain was 0.91, for the psychological domain was 0.90, for the social relationship domain was 0.91 and for the environment domain was 0.89. The instrument performed well and was a suitable measure of HRQOL among people with diabetes.

Discussion

This study examined the HRQOL and explored the sociodemographic and disease-related variables that significantly affected the QOL of Emirati people with diabetes. The results revealed that people with diabetes in the UAE had a moderate level of HRQOL, as illustrated by the mean total score and subscale scores, which ranged from 61.5 to 65.5 (on a 0 to 100 point scale). Comparing the results of the current study with previous research revealed that scores on the HRQOL in people with diabetes vary across cultures. Similar studies using the WHOQOL-BREF reported different mean scores for the overall HRQOL and its domains. For example, people with diabetes in this UAE sample scored lower on the HRQOL (mean scores 61.5 to 65.5) than Danish people with diabetes (mean scores 70.0 to 76.0) [18], higher than people in Gaza (mean scores 32.0 to 52.0) [7] and slightly higher than Iranian people with diabetes (mean scores 55.7 to 63.8) [4]. Similar differences exist for the domains of HRQOL in people with diabetes in different cultures. People with diabetes in this sample scored highest on social relationships, whereas

Table 3 Results of regression analysis for variables associated with total health-related quality of life (HRQOL) and domains of HRQOL in patients with diabetes mellitus (DM)

Variable	Total HRQOL		Domains of HRQOL							
			Physical		Psychological		Social		Environment	
	β	*P*-value	β	*P*-value	β	*P*-value	β	*P*-value	β	*P*-value
Sex	0.03	0.71	0.051	0.44	0.026	0.71	0.046	0.51	0.06	0.42
Age	0.15	0.09	0.06	0.46	0.116	0.19	0.12	0.13	0.11	0.22
Income	0.05	0.49	0.07	0.33	0.002	0.98	0.056	0.44	0.07	0.35
Marital status	0.19	0.02	0.11	0.18	0.14	0.12	0.17	0.045	0.21	0.01
Education level	0.11	0.10	0.10	0.14	0.13	0.08	0.05	0.48	0.11	0.12
Type of DM	0.02	0.81	0.07	0.29	0.040	0.60	0.04	0.61	0.006	0.093
Duration of DM	0.15	0.04	0.15	0.043	0.10	0.21	0.81	0.02	0.16	0.02
Complications of DM	0.24	0.001	0.34	0.001	0.19	0.01	0.19	0.03	0.16	0.02
R^2	0.15		0.20		0.085		0.091		0.13	

people with diabetes in Islamic Republic of Iran scored highest on the physical domain [4], and people with diabetes in Gaza attained the highest score on the social relationship domain [7].

The above differences in the mean scores of HRQOL and its domains among people with diabetes is evidence that the HRQOL is a subjective concept and is perceived differently by people in different cultures [4,5,9,11,22]. There are some characteristics of the UAE culture that may explain the moderately high HRQOL in the current sample even in the presence of a chronic disease. The first characteristic is the relatively high incomes of UAE residents compared with other countries in the same region [4]. The UAE is considered as the wealthiest country in the region and the gross national income *per capita* is US$ 31 190 [23]. Most citizens of the UAE therefore have adequate financial resources, transportation, housing and entertainment facilities and is likely to have a positive influence on their general QOL. The second characteristic is the social environment of the UAE culture in which people enjoy strong social relationships and family connections. The third characteristic is a secure and safe environment that accompanies the political stability of the UAE region. It is possible that these characteristics buffer or decrease the perceived burden of diabetes on HRQOL, especially in the social relationship and environment domains.

The HRQOL of people with diabetes not only varies across different cultures, but it might differ across people living in the same country. Expatriates with diabetes who reside in the UAE, for example, do not have the same family and social resources as UAE nationals and this may negatively influence their perceptions of HRQOL.

This study also provided clear evidence that the concept of HRQOL is a reflection of individual and disease-related variables [9,11,12]. Consistent with previous research, the duration of diabetes, the presence of complications of diabetes [3,5,12] and marital status [5,7,13] significantly affected the HRQOL of people with diabetes. Presence of complications was the most influential variable affecting the HRQOL in this study, especially the domain of physical health.

The current study confirmed the reliability of the Arabic version of the WHOQOL-BREF questionnaire. The tool demonstrated good internal consistency reliabilities for total scores and subscales scores and this agrees with previous research using the same questionnaire [7]. As demonstrated, the WHOQOL-BREF is a suitable generic assessment tool that can be used to evaluate the HRQOL among people with diabetes in the Arab world.

Implications for health care professionals

This study offered a unique opportunity to evaluate the HRQOL of people with diabetes in the UAE and provided important data that has direct implications for health care providers in their practice. The study revealed that all aspects of HRQOL are significantly affected by the complications of diabetes. Therefore health care providers should implement interventions that focus on early detection of diabetes mellitus, mainly type 2, to prevent development of late complications in asymptomatic individuals [24]. Health care providers need to initiate public awareness campaigns about diabetes across the UAE to identify people at risk and to enhance early detection and diagnosis of diabetes in the region. Such intervention strategies should empower patients to practise good control of their diabetes to prevent long-term complications and hence improve their HRQOL. The United Kingdom Prospective Diabetes Study showed that maintaining lower glucose levels may reduce the risk of long-term complications from diabetes [25].

Conclusion

This study was the first to evaluate HRQOL among people with diabetes in the Arab Gulf region. It contributes to the literature by providing background information that can be utilized by health care professionals in research and practice to guide diabetes education and care in the region. Moreover, the study provided further evidence of the usefulness and reliability of the Arabic translated WHOQOL-BREF as a tool to assess the HRQOL of people with diabetes in other Arabic countries. However, we recommend use of additional diabetes-specific tools in conjunction with this generic HRQOL tool for more accurate assessment of HRQOL. Finally, although these study results are useful, the data in this study were obtained from the 2 richest cities in the UAE, Abu Dhabi and Dubai, and were limited to UAE nationals. Data from poorer cities in the UAE and from expatriates should be included in future research to determine differences in targeted interventions for people with diabetes.

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