

## Association of certain sociodemographic and clinical characteristics of diabetic patients with quality of life

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### Abstract

**Background and objectives:** Diabetes mellitus is a common and demanding health problem that has a great effect on everyday life of patients. This study was done to determine sociodemographic and clinical characteristics that affect the quality of life (QOL) of diabetic patients.

**Methods:** A total of 300 patients with diabetes mellitus in Erbil city were included in this study. The World Health Organization Quality of Life (WHOQOL-100) questionnaire was applied for assessment of 6 domains of QOL using multiple regression analysis.

**Results:** Type of work and body weight were the most significant factors shown to affect diabetic patients QOL domains. Type of work was significantly affecting physical ( $P=0.006$ ), psychological ( $P=0.004$ ), level of independence ( $P<0.001$ ) environmental ( $P=0.007$ ) and spiritual ( $P=0.009$ ) QOL domains. Duration of diabetes was significantly affecting physical ( $P=0.002$ ), psychological ( $P=0.037$ ) and level of independence ( $P<0.001$ ) domains. Body weight was significantly affecting physical ( $P=0.039$ ), psychological ( $P=0.012$ ), level of independence ( $P=0.036$ ), social relationships ( $P=0.022$ ) and spiritual ( $P=0.030$ ) QOL domains.

**Conclusion:** QOL had a variable significant association with certain socio-demographic and clinical characteristics of diabetics. There should be an emphasis on improving QOL of diabetics and consequently achieving better metabolic control.

**Key words:** Diabetes, quality of life, Erbil- Iraq

### Introduction

Diabetes is one of the most common non-communicable diseases globally, and has evolved in association with increased obesity, rapid cultural and socioeconomic changes, aging of the population, increasing urbanization, dietary changes, reduced physical activity and other unhealthy lifestyle and behavioral patterns (smoking, alcohol consumption)<sup>1</sup>. Diabetes requires a Lifelong management plan and persons with diabetes have a central role in this plan. Lifestyle modifications are an opportunity for diabetics to take charge of their health. Therefore, it is important to learn as

much as possible about diabetes and to take an active role in making decisions about health care and treatment<sup>2</sup>. Socio-demographic factors are as important as serious physical health needs, in affecting the ability of individuals to function normally in their daily life. As a result they should be taken seriously into consideration, when planning interventions for the prevention of diabetes in the community<sup>3</sup>. In Iraq studies on the QOL of diabetics are scarce<sup>4,5</sup>. Recently a case-control study assessed the effect of diabetes on physical and psychological domains of QOL in Erbil city<sup>6</sup>. This study was done to determine sociodemographic and clinical

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characteristics that affect the quality of life (QOL) of diabetic patients.

### Methods

A cross-sectional study was conducted from the 1<sup>st</sup> of June through 31<sup>st</sup> December, 2009 at Shahid Layla Qassim Health Center for Diabetic Patients in Erbil city. Data were collected by direct interview from a sample of 300 type 1 and type 2 diabetics through application of the World Health Organization Quality of Life (WHOQOL- 100) questionnaire <sup>7</sup>. Inclusion criteria for the diabetic patients were: age 18 years and older, established diabetes for at least 1 year according to the WHO criteria <sup>8</sup>, and patient free from any co-morbidity. The questionnaire includes two parts:

Part I: Sociodemographic characteristics of diabetic patients including age, gender, residence, educational level, marital status, type of work, family size, body mass index (BMI), smoking, alcohol drinking, financial status, and clinical factors including type of diabetes, family history of diabetes and duration of diabetes.

Part II: (WHOQOL- 100) questionnaire: The structure of the WHOQOL-100 questionnaire includes 6 domains (physical, psychological, level of independence, social relations, environment and spirituality). These domains contain 24 facets; each of 4 items with additional facet of 4 items pertains to QOL and general health making 100 items in total. The sexual activity facet was omitted for social and cultural reasons. Thus the total number of items was 96; all items were rated on a five point scale (1-5). All domain scores were scaled in a positive direction (i.e. higher scores denote higher QOL). Facet total of scoring are obtained by summing scores for the four constituent items from that facet. Several facets (pain and discomfort, negative feelings, dependence on medication or treatment) contain negatives items which need to be reverse-scored before facet scores are calculated, using the formula: "x (rev) = 6 - x" <sup>9</sup> where x is the score given for each negative item. A pilot test of the instruments was

performed on 15 diabetic patients on May 2009 and re-tested on the same sample after 2 weeks and showed a reliability correlation coefficient of  $\geq 0.82$ . The internal reliability was high for all domains. Cronbach's alpha <sup>10</sup> was 0.76 for physical domain, 0.82 for psychological domain, 0.84 for independent domain, 0.74 for social relationship domain, 0.89 for environmental domain and 0.86 for spiritual domain. The questionnaire was reviewed by a panel of 19 experts' in the field of diabetes and epidemiology. Changes and modifications were made according to their recommendations. The nature of the study was explained for each participant and a verbal informed consent was obtained from each of them before data collection. Level of education was classified according to the years of formal education into  $\leq 6$  years (including illiterates and un-schooled) 7-12 years and  $>12$  years. Marital status was classified as single, married and widowed. Family size of diabetic patients (number of people financially depending on the participant) was classified into  $\leq 5$ , 6-10, and  $> 10$  peoples and the duration of diabetes was classified into  $\leq 5$ , 6-10, and  $> 10$  years according to the classification used by other workers <sup>11, 12</sup>. Patient's type of work was classified as sedentary, moderate and heavy according to classification of lifestyles in relation to the intensity of habitual physical activity recommended by the report of a joint FAO/WHO/ UNU expert consultation <sup>13</sup>. Body weight was classified as underweight (BMI:  $<18.5 \text{ kg/m}^2$ ), normal (BMI:  $18.5\text{--}24.9 \text{ kg/m}^2$ ), overweight (BMI:  $25\text{--}29.9 \text{ kg/m}^2$ ), obese (BMI:  $\geq 30.0 \text{ kg/m}^2$ ). BMI was calculated using the formula: weight (Kg) / height ( $\text{m}^2$ ), as recommended by WHO <sup>14</sup>. Diabetic patients were classified according to smoking status into smokers (defined as a persons smoking one or more cigarette daily <sup>15</sup>), non-smokers, and exsmokers, while regarding alcohol drinking they were classified simply into alcohol drinkers, and non-drinkers. Monthly family income in Iraqi Dinars (ID) was classified according

to their income in Iraqi dinar (ID) into low (<500000 ID), middle (500000-999999 ID) and high ( $\geq$ 1000000 ID) which is similar to the classification of diabetics in Saudi Arabia according to their income in Saudi Arabian Riyal<sup>16</sup>. The Statistical Package for Social Sciences (SPSS) software (Version 18; SPSS, PASW) was used for analysis. All domain scores are scaled in a positive direction (higher scores denote higher QOL). Multiple regression analysis was used to assess the QOL of diabetic patients throughout the 6 domains of QOL and general health in relation to socio-demographic and clinical characteristics of participants.

## Results

Out of the total sample of diabetic patients 38% were males, the mean age  $\pm$  SD of the total sample was  $50.49 \pm 11.463$  years and 96.7% of them had type 2 diabetes mellitus. More than one third (34.4%) of female diabetics were  $\geq$ 60 years of ages, 84.4% with  $\leq$  primary school education level, 19.9% widowed, 14.5% having sedentary work, 34.9% were overweight or obese and 15.1% only had high monthly family income in comparison with males (22.8%, 61.4%, 6.1%, 7%, 22.8% and 29.8%, respectively). These gender variations are of statistical significance ( $P=0.033$ ,  $P<0.001$ ,  $P=0.001$ ,  $P=0.049$ ,  $P=0.026$  and  $P=0.002$ , respectively). These findings are shown in (Table 1).

Table (2) shows that the overall and general health QOL of diabetic patients was significantly affected by age ( $P=0.014$ ), years of formal education ( $P=0.003$ ), type of work ( $P=0.006$ ), duration of disease ( $P=0.004$ ), body weight ( $P=0.034$ ) and smoking ( $P=0.032$ ). The physical domain of QOL of diabetic patient's was significantly affected by age ( $P=0.001$ ), gender ( $P=0.034$ ), years of formal education ( $P=0.027$ ), type of work ( $P=0.006$ ), duration of disease ( $P=0.002$ ), body weight ( $P=0.039$ ), and monthly family income ( $P=0.021$ ), while the psychological domain of QOL of diabetic patients was significantly

affected by years of formal education ( $P=0.001$ ), type of work ( $P=0.004$ ), duration of disease ( $P=0.037$ ), body weight ( $P=0.012$ ), and monthly income ( $P=0.011$ ). Physical and psychological domains scores are shown in (Table 3). The level of independence domain of diabetic patient's QOL was significantly affected by age ( $P=0.022$ ), residence ( $P=0.048$ ), marital status ( $P=0.009$ ), type of work ( $P<0.001$ ), duration of disease ( $P<0.001$ ), type of diabetes ( $P=0.018$ ), body weight ( $P=0.036$ ), smoking ( $P=0.045$ ), and alcohol drinking ( $P=0.01$ ). The social relationship domain of diabetic patient's QOL was significantly affected by residence ( $P=0.044$ ), marital status ( $P=0.011$ ), family size ( $P=0.048$ ) and type of diabetes ( $P=0.023$ ), body weight ( $P=0.022$ ). Both findings are shown in (Table 4). Age, years of formal education, type of work, smoking and monthly income were significantly ( $P=0.022$ ,  $0.007$ ,  $0.007$ ,  $0.039$  and  $0.018$  respectively) affecting the environment domain of diabetic patient's QOL. Finally the spiritual domain of QOL was significantly affected by marital status ( $P=0.022$ ), type of work ( $P=0.009$ ), body weight ( $P=0.03$ ), smoking ( $P=0.027$ ) and alcohol drinking ( $P=0.043$ ). These findings are shown in (Table 5).

**Table 1:** Certain socio-demographic characteristics of diabetic patients by gender.

Socio-demographic characteristics	Gender			
	Male		Female	
<b>Age groups ( years)</b>	No.	%	No.	%
< 30	6	5.3	8	4.3
30 - 39	8	7	16	8.6
40 - 49	23	20.2	52	28
50 - 59	51	44.7	46	24.7
≥ 60 years	26	22.8	64	34.4
<b>Years of formal education (years)</b>				
≤ 6	70	61.4	157	84.4
7-9	15	13.2	8	4.3
10- 12	13	11.4	4	2.2
> 12	16	14	17	9.1
<b>Marital status</b>				
Single	6	5.3	10	5.4
Married	101	88.6	139	74.7
Widowed	7	6.1	37	19.9
<b>Type of work</b>				
Heavy work	20	17.5	13	7
Moderate work	86	75.4	146	78.5
Sedentary work	8	7	27	14.5
<b>Body weight</b>				
Normal weight	88	77.2	121	65.1
Overweight	19	16.7	40	21.5
Obese	7	6.1	25	13.4
<b>Family monthly income</b>				
Low	34	29.8	60	32.3
Middle	46	40.4	98	52.7
High	34	29.8	28	15.1
Total	114	100	186	100

**Table 2:** Multiple regression model to predict QOL of overall and general health QOL scores for diabetic patients.

Socio-demographic and clinical characteristics	Overall and general health QOL		
	(B) <sup>x</sup>	S.E. <sup>xx</sup>	P value
Age	-0.013	0.005	0.014
Gender	-0.133	0.115	0.248
Residence ( Urban/ Rural)	0.283	0.198	0.154
Education level	0.135	0.044	0.003
Marital status	-0.211	0.127	0.097
Type of work	-0.321	0.116	0.006
Family size	-0.084	0.089	0.346
Duration of diabetes	-0.151	0.052	0.004
Type of diabetes	-0.235	0.319	0.462
Body weight ( BMI)	-0.029	0.014	0.034
Smoking	-0.177	0.082	0.032
Alcohol drinking	-0.203	0.361	0.574
Family monthly income	0.068	0.079	0.389
(Constant)	17.409	0.851	< 0.001

<sup>x</sup> Regression coefficient / <sup>xx</sup> Standard error

**Table 3:** Multiple regression model to predict QOL of physical and psychological domains scores for diabetic patients.

Socio-demographic and clinical characteristics	Physical domain			Psychological domain		
	(B )	S.E	P value	(B )	S.E	P value
Age	-0.025	0.007	0.001	-0.005	0.005	0.391
Gender	-0.337	0.158	0.034	0.081	0.115	0.485
Residence ( Urban/ Rural)	0.486	0.272	0.075	0.326	0.198	0.101
Education level	0.135	0.061	0.027	0.147	0.044	0.001
Marital status	-0.123	0.174	0.482	-0.183	0.126	0.149
Type of work	-0.443	0.16	0.006	-0.334	0.116	0.004
Family size	0.060	0.123	0.627	0.013	0.089	0.889
Duration of diabetes	-0.226	0.071	0.002	-0.108	0.052	0.037
Type of diabetes	0.011	0.439	0.981	-0.337	0.319	0.291
Body weight ( BMI)	-0.039	0.019	0.039	-0.034	0.013	0.012
Smoking	-0.187	0.113	0.100	-0.058	0.082	0.478
Alcohol drinking	0.536	0.497	0.281	0.37	0.361	0.306
Family monthly income	0.252	0.109	0.021	0.204	0.079	0.011
(Constant)	16.167	1.17	< 0.001	15.076	0.85	< 0.001

**Table 4:** Multiple regression model to predict QOL of level of independence and social relationships domains scores for diabetic patients.

Socio-demographic and clinical characteristics	Level of independence domain			Social relationships domain		
	(B )	S.E	P value	(B )	S.E	P value
Age	-0.011	0.005	0.022	.000	0.004	0.977
Gender	-0.069	0.100	0.494	-0.069	0.095	0.47
Residence ( Urban/ Rural)	0.343	0.172	0.048	0.329	0.163	0.044
Education level	0.001	0.038	0.981	-0.016	0.036	0.668
Marital status	-0.289	0.11	0.009	-0.266	0.104	0.011
Type of work	-0.56	0.101	< 0.001	0.058	0.096	0.543
Family size	-0.063	0.078	0.415	0.146	0.074	0.048
Duration of diabetes	-0.304	0.045	< 0.001	0.023	0.042	0.585
Type of diabetes	-0.66	0.278	0.018	-0.599	0.263	0.023
Body weight ( BMI)	-0.025	0.012	0.036	-0.026	0.011	0.022
Smoking	-0.144	0.072	0.045	0.067	0.068	0.325
Alcohol drinking	0.821	0.315	0.01	-0.216	0.297	0.469
Family monthly income	0.023	0.069	0.735	0.055	0.065	0.401
(Constant)	15.324	0.741	< 0.001	16.004	0.701	< 0.001

**Table 5:** Multiple regression models to predict QOL from environmental and spiritual domains scores for diabetic patients.

Socio-demographic and clinical characteristics	Environmental domain			Spiritual domain		
	(B)	S.E	P value	(B)	S.E	P value
Age	-0.015	0.006	0.022	0.003	0.006	0.583
Gender	0.113	0.14	0.42	0.103	0.129	0.427
Residence ( Urban/ Rural)	0.094	0.24	0.697	0.02	0.222	0.929
Education level	0.145	0.054	0.007	0.048	0.05	0.333
Marital status	-0.129	0.154	0.40	0.327	0.142	0.022
Type of work	-0.385	0.141	0.007	0.343	0.130	0.009
Family size	-0.057	0.108	0.597	-0.155	0.100	0.123
Duration of diabetes	-0.036	0.063	0.569	-0.08	0.058	0.171
Type of diabetes	-0.332	0.387	0.393	0.027	0.358	0.94
Body weight ( BMI)	0.022	0.016	0.172	-0.033	0.015	0.030
Smoking	-0.207	0.100	0.039	-0.205	0.092	0.027
Alcohol drinking	0.069	0.439	0.875	-0.824	0.406	0.043
Family monthly income	0.228	0.096	0.018	0.057	0.089	0.526
(Constant)	14.459	1.033	< 0.001	15.225	0.956	< 0.001

## Discussion

In this study old age, smoking, longer duration of diabetes and obesity were associated with negative effect on QOL, while the level of education and type of work had statistical significant effect on overall and general health in positive direction, patients who had higher level of education and heavy worker had higher QOL. These results are similar to those reported in India<sup>17</sup>. Age of diabetic patients was a significant factor affecting the physical, level of independence and environmental QOL domains. Younger diabetic patients had better QOL than old patients. This may be a reflection of aging process and lower physical activity that led to low QOL in diabetic patients. This result is similar to that revealed by a study in Saudi Arabia<sup>16</sup>. Gender of diabetic patients had a significant relationship with physical QOL domain only; males had better QOL than females. This result is similar to those of studies conducted in Gaza strip<sup>11</sup> and Iran<sup>18</sup>. This finding could be attributed to gender inequalities or that a significantly higher proportion of females were  $\geq 60$  years of ages, widowed and overweight or obese, had a lower education level and sedentary work, in addition to

a significantly lower proportion of them having high family monthly income in comparison with males. Residence of diabetic patients had a significant relationship with social relationships and level of independence QOL domains. Urban residents had lower social relationships (working capacity, activities of daily living) than rural residents; a finding along with study conducted in India<sup>17</sup>, and in contrast to study done in Estonia<sup>12</sup>. The level of education of diabetic patients had statistical significant effect on physical, psychological and environment domains of QOL in positive direction. High level of education is associated with better physical, psychological and environmental QOL. This finding is important because education is an essential factor in understanding self care and management of diabetes, glycaemic control, and perception of self worth. This finding is supported by those revealed by studies conducted in Gaza strip<sup>11</sup> and Nigeria<sup>19</sup> which revealed that generally patients who scored good QOL had high level of education, especially concerning physical and emotional functioning. Marital status of diabetic patients was a significant factor shown to affect the level of independence, social relationships and spiritual QOL

domains. In a previous study in Erbil<sup>6</sup> single diabetics of both genders have a significantly higher QOL than both married and widowed and married have a significantly higher QOL than widowed in both genders. This result is coming along with that of a study conducted in Gaza strip<sup>11</sup>. In addition, type of work of diabetic patients was shown to significantly affecting the physical, psychological; level of independence, environmental, and spiritual QOL domains in positive direction i.e. heavy workers had higher QOL. This result is consistent with the results of studies carried out in Saudi Arabia<sup>16</sup> and UK<sup>20</sup>, which revealed that exercise of 30 minutes for 3 days or more each week produce positive changes in QOL. Family size had a significant relationship with social relationships QOL domain only; large families were associated with better personal relationships and social support. This could be attributed to intimate family relationships in our society. Duration of diabetes had a negative effect on the physical, psychological and level of independence domains of QOL, the shorter the duration of the disease the better QOL. This result agrees with that of a study in USA<sup>21</sup>, while disagrees with that of a study carried out in Iraq<sup>5</sup>. Type of diabetes had a statistically significant effect on level of independence domain in positive and social relationships domain in negative direction. Type 1 of diabetes patients had better QOL concerning activities of daily living and working capacity while type 2 had better QOL regarding personal relationships and social support. This result agrees with that of a study done in Norway<sup>22</sup>, but disagrees with that of a study carried out in USA<sup>23</sup>. Regarding body weight (BMI) of diabetic patients; this study revealed a significant negative relationship between BMI and physical, psychological, independence, social relationships, spiritual QOL domains. Obese patients had lower QOL than non-obese patients. This result is similar to that of a study carried out on Dutch patients<sup>24</sup>. Alcohol drinkers had significantly higher level of independence indicating that

alcohol drinkers had better working capacity and activities of daily living than non-drinkers. This may be attributed to the probability of consuming light to moderate amount of alcohol as demonstrated by other studies<sup>25,26</sup>. However, they had lower spiritual QOL than non-drinkers, as alcohol drinkers may lack religious and personal beliefs. Monthly family income of diabetic patients had statistically significant effect on physical, psychological and environmental domains of QOL in positive direction i.e. high financial status was associated with better QOL, a result which agrees with that of a study in USA<sup>27</sup>. Finally, in this study; smoking had a significant affect on the level of independence and spiritual QOL domains. Non-smokers had better working capacity and activities of daily living than smokers and ex-smokers. This result agrees with a study done in Sweden<sup>15</sup>. In conclusion QOL had a variable significant association with certain socio-demographic and clinical characteristics of diabetics. Therefore, there should be an emphasis on changing modifiable socio-demographic characteristics aiming at improving health-related QOL of diabetics and consequently achieving better metabolic control. Diabetes care needs to involve multidisciplinary activities, the family, diabetes health centre, the co-operation and collaboration of many practitioners, nurses, dieticians' podiatrists, psychologists and doctors.

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