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Study of the Quality of Life of Diabetic Patients Treated at the HMA

El Jaafari FZ[1*], Abainou L[2], El Hadri S[2], Meftah A[2-3], Laffinti A[4], Baizri H[2-3]

[1]Endocrinology, Diabetology and Metabolic Diseases Department, Ar-razi Hospital, Mohammed VI University Hospital, Marrakech, Morocco
[2]Endocrinology, Diabetology and Metabolic Diseases Department, Avicenne Military Hospital, Marrakech, Morocco
[3]Bioscience and Health Research Laboratory, Faculty of Medicine and Pharmacy, Cadi Ayyad University, Marrakech, Morocco
[4]Psychiatry Department, Avicenne Military Hospital, Marrakech, Morocco

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***Corresponding author:** El Jaafari FZ
Endocrinology, Diabetology and Metabolic Diseases Department, Ar-razi Hospital, Mohammed VI University Hospital, Marrakech, Morocco

Abstract **Original Research Article**

Introduction: Maintaining or improving quality of life is a major issue in health care, particularly in the context of chronic diseases such as diabetes. The SF-12 is a generic quality of life questionnaire applicable to patients with diabetes. The aim of this study is to assess the quality of life of diabetic patients using a generic SF-12 questionnaire and to detect factors related to this concept. **Materials and methods:** This is a descriptive, cross-sectional and analytical observational study that involved 130 diabetic patients followed up in the Endocrinology, Diabetology and Metabolic Diseases Department at the Avicenne Military Hospital in Marrakech. **Results:** The average age of our population was 50.5 years, with extremes ranging from 7 to 80 years. Females were predominant (52%). The average age of diabetes was 9.55 years (extremes ranging from 15 days to 35 years). The majority of cases (63%) had a history of ketoacidosis and (43%) had a history of hypoglycemia. The results showed that diabetes negatively affects the quality of life of diabetic patients and that the factors associated with their quality of life are multiple : factors related to socio-demographic characteristics (age and sex), socio-economic characteristics (profession, socio-economic level), co-morbidities (hypertension, dyslipidemia, obesity, sedentary lifestyle), and factors related to the disease itself and its acute (hypoglycemia, ketoacidosis) and chronic complications (occlusive arterial disease of the lower limbs (PAOD), myocardial infarction (MI)). **Discussion:** In order to improve the quality of life of diabetic patients, it is necessary to improve their level of education, to ensure a global management of the diabetic person, of the complications related to diabetes and to implement education strategies and programs as well as community interventions.

Keywords: Diabetes, Quality of life, SF-12.

INTRODUCTION

Diabetes is a serious chronic disease defined as a state of chronic hyperglycemia secondary to insulin deficiency, either absolute in type 1 diabetes (T1DM) or relative in type 2 diabetes (T2DM). It is a major public health problem. Its prevalence is constantly increasing. Estimates for the coming years are very alarming: worldwide, the prevalence of diabetes in adults aged 20 to 79 is estimated at 8.8% in 2017 and is expected to rise to 48% in 2045 [1]. In 2016, according to the World Health Organisation (WHO), the prevalence of diabetes in Morocco was 12.4%, and the total death rate among diabetics of all ages was 12% [2].

Because of its complications, diabetes increases both morbidity and mortality. It can therefore alter patients' quality of life through its physical and psychological impact [3,4]. Health-related quality of life (QOL) is a concept newly defined by the WHO as "An individual's perception of his or her place in life, in the context of the culture and value system in which he or she lives, in relation to his or her goals and expectations, norms and concerns" [4]. It is a means of assessing the physical, psychological and social repercussions of the disease on the patient's life [5].

In Morocco, few studies have been carried out in this field, which may be due to the inaccessibility of standardized and valid measuring instruments for healthcare professionals. The "Medical Outcome Short Form 36" MOS-SF 36, and its reduced form "the SF-12", is a generic instrument for measuring HRQoL developed in 1994 from the MOS-SF-36. It is one of the most widely used generic instruments for measuring

HRQoL today [6]. For diabetes, the measurement instruments with good psychometric properties are: Diabetes-39 "D-39", Audit Diabetes Dependent Quality of life "ADDQOL", Diabetes Health Profile "DHP" [5].

The aims of our study are to assess the quality of life of type 1 and type 2 diabetic patients, to determine their needs for psychological support, and to propose a support strategy for diabetic patients in order to improve their quality of life.

MATERIALS AND METHODS

This was an observational, cross-sectional, descriptive and analytical study of type 1 and type 2 diabetic patients recruited from the consultation of the Diabetology and Metabolic Diseases Endocrinology Department of the Avicenne Military Hospital in Marrakech.

The variables in our study were organized in the form of two questionnaires:

- Questionnaire comprising five chapters: identity, epidemiology, history, history of diabetes, and treatment.
- Generic quality of life questionnaire SF 12 in its Moroccan Arabic version.

This self-assessment quality of life scale is a shortened version of the MOS-SF 36. Scores vary from 0 to 100, and when they tend towards 100, they indicate a better quality of life. A score above 50 represents average health. In contrast, people with a score of 40 function at a level below 84% of the population and people with a score below 30 function at a level below about 98% of the population [8]. Data were entered using Microsoft Excel version 16.63 (2019) and SPSS software version 28.0.1.1(2014). The significance level was set at 5% (p=0.05).

RESULTS

One hundred and thirty (130) subjects were included in this study; of which 30 patients are followed for T1DM and 100 patients for T2DM. The mean age of our sample was 50.5 years with extremes ranging from 7 to 80 years, and 52% were women. One hundred and twenty-four (124) of our patients (95%) lived in urban areas, 91 (70%) were at school, 55 (42%) had a professional activity and 92 (71%) had a low socio-economic status. In our series, all diabetics had medical cover.

High blood pressure was present in 28 of our patients (22%), 27 (21%) had dyslipidemia and 24 (19%) were obese. In our series, 17 of our sample (13%) had a psychiatric history (ATCDs) of the following types: depression, anxiety, obsessive-compulsive disorder (OCD). Forty-nine of our patients (38%) had other medical conditions, the most common of which were dysthyroidism and goiter. One hundred and twenty-four (124) of our diabetic patients (95%) lived with their families, and six (5%) lived alone. Three (2%) of our patients had a history of psychiatric disorders, mainly depression.

Retinopathy was the most common microangiopathy in our diabetic patients, accounting for 19% (24 patients) of diabetic complications, followed by nephropathy at 5% (6 patients). MI accounted for 5% (7 patients) of the macro-angiopathies complicating diabetes, while PAOD was present in 1% of our patients. Only two patients (2%) in our sample had developed a diabetic foot. Diabetic ketoacidosis was the most frequent acute complication in our diabetic patients, occurring in 82 (63%) patients, while 56 (43%) patients had presented with hypoglycemia.

Of the 130 patients, 81 (62%) were treated with non-insulin antihyperglycemic agents (NI), of whom 44 (33%) were treated with a single NI antihyperglycemic agent and 37 (28%) with a combination of two NI antihyperglycemic agents. Insulin therapy was initiated in 72 of our patients (55%), of whom 30 (23%) were T1DM and 42 (32%) T2DM. In addition, 44 of our diabetic patients (34%) were on a basal-bolus regimen, 14 (11%) on a 2 or 3 premix regimen, while 14 (11%) were on a bed-time regimen. One hundred and twenty-nine (129) patients (99%) did not benefit from psychological monitoring of their diabetes.

One hundred and thirty (130) diabetic patients had completed the generic SF-12 questionnaire. For the summary physical score, the median was 44.05 with a minimum score of 22.2 and a maximum score of 56.5. For the mental summary score, the median was 37.95 with a minimum score of 18.2 and a maximum score of 57.8 (*table 1*).

Table 1: Overall results for the SF-12

	PCS-12	MCS-12
Average	42.7230769	37.8692308
Standard deviation	8.30301653	9.15741616
Median	44.05	37.95
Minimum	22.2	18.2
Maximum	56.5	57.8

PCS: physical summary score, MCS: mental summary score.

Age, presence of co-morbidities (hypertension, dyslipidemia, obesity, sedentary lifestyle), family lifestyle, type of diabetes (type 1 diabetic patients have a better physical quality of life than type 2 diabetic patients), presence of chronic complications (MI, OIA) are significantly associated with the physical summary score, unlike the mental summary score.

It was also noted that gender (men had a higher generic mental quality of life than women), BMI, occupation, presence of personal history of psychiatric disorders, age at onset of diabetes and its duration, and presence of acute complications were significantly associated with the mental summary score, unlike the physical summary score. Compliance with dietary hygiene measures, good knowledge of the disease and therapeutic objectives were significantly associated with generic quality of life.

The other parameters (variables) studied did not show a significant link with generic quality of life. All the results of the univariate analysis are summarized in the table (table 2).

Table 2: Summary table of the bivariate analysis

	PCS-12 (p)	MCS-12 (p)
1- Age (year)	0,015	0,593
2- Gender	0,089	0,039
3- Origin	0,698	0,849
4- BMI (kg/m2)	0,066	0,034
5- Marital status	0,075	0,344
6- Level of education	0,009	0,129
7- Occupation	0,583	0,038
8- Socio-economic level	0,220	0,153
9- Medical cover	-	-
10- Personal history :		
- Smoking	0,816	0,459
- Alcohol consumption	0,091	0,042
- High blood pressure	0,003	0,810
- Dyslipidemia	0,001	0,325
- Obesity	0,008	0,005
- Sedentary lifestyle	0,015	0,054
- Psychiatric disorders	0,332	0,019
- Other medical history	0,005	0,042
11- Lifestyle	0,293	0,023
12- Family history :		
- T2DM	0,824	0,930
- T1DM	0,606	0,054
- Psychiatric disorders	0,131	0,064
13- Type of diabetes	0,007	0,534
14- Age of onset	0,042	0,700
15- Age of diabetes	0,002	0,271
16- Mode of onset	0,138	0,582
17- Complications	0,941	0,593
- Retinopathy	0,278	0,253
- Nephropathy	-	-
- Neuropathy	-	-
- CVA	0,002	0,152
- MI	0,033	0,113
- PAOD	0,582	0,239
- Diabetic foot	0,056	0,029
- Hypoglycaemia	0,546	0,013
- Ketoacidosis		
18- Hygienic and dietary measures :		
- Diet	0,006	0,001
- Physical activity	0,001	0,001
19- Treatment with :		
- Non-insulin anti-hyperglycemic agents	0,439	0,883
- Insulin	0,224	0,101
- Insulin therapy regimen	0,077	0,034
20- Frequency of medical visits	0,337	0,352
21- Knowledge of the disease and therapeutic objectives	0,001	0,021
22- Psychological follow-up of diabetic disease	0,570	0,573
-		

DISCUSSION

Diabetes mellitus is a metabolic disorder characterized by the presence of hyperglycemia attributable to a defect in insulin secretion and/or insulin action [9]. It is associated with peripheral tissue resistance to insulin [10]. The two main categories of diabetes are type 1 (10%) and type 2 (90%). Type 1 diabetes is characterized by insufficient insulin production, which must be administered daily. The cause of type 1 diabetes is not known; it is an autoimmune disease whose etiopathogenic mechanisms have not yet been elucidated.

Type 2 diabetes is the most common form, accounting for almost 90% of diagnosed cases. The etiology of the disease is complex, involving both genetic and environmental factors. Obesity is the leading risk factor for diabetes, as is age [12]. Over time, diabetes can lead to damage to the heart, blood vessels, eyes, kidneys and nerves. The only treatment for type 1 diabetes is insulin injections, which are essential for life. The reference treatment for type 2 diabetes is the optimisation of lifestyle habits (regular physical activity, smoking cessation and a healthy diet), which may be sufficient to control blood glucose levels in the first instance. In the second instance, OADs and/or insulin therapy are prescribed to control blood glucose levels [13].

The physical summary score (PCS=42.72) and mental summary score (MCS=37.86) in our population were slightly lower than in the majority of studies in the literature. The PCS-12 was slightly better than the studies conducted by Clouet (France) and Fariha (Pakistan). Participants in our study therefore had a lower level of quality of life than participants in other countries (table 3).

Table 3: Comparison of the physical and mental health scores of our participants with other populations

	PCS-12	MCS-12
France 2(Clouet-2001) [37]	38.8	43.6
Lebanon (M. wehbi-2004) [38]	42.07	59.32
France 1(Entred-2007) [39]	57.6	56.4
Greece (Papadopoulous-2007) [40]	60.4	64.7
Pakistan (Fariha.Sh-2012) [41]	37.9	36.46
Poland (Jankowska-2021) [42]	54.5	48.8
Our study	42.72	37.86

PCS: physical summary score, MCS: mental summary score.

The results of our study show that younger age is associated with better quality of life and more significantly for the physical summary score (p=0.015), which is in line with the results found in the literature [14,15,16,17,18]. Indeed, advanced age is generally a risk factor for a number of defects that may be associated with diabetes and thus impair quality of life. In our study, women had a significantly lower mental quality of life score than men. These results are also similar to those found in the literature, notably in the studies by Papadopoulous in Greece, Sh. Fariha in Pakistan and Jankowska in Poland [16,17,18]. This may be explained by the fragility of women and by the psycho-social aspects associated with the conception of the female gender.

According to our results, education is significantly associated with a better quality of life, particularly with the physical summary score (p=0.009). This is consistent with the majority of results found in the literature [14,15,16,17,18,19]. These results may be explained by the ability of educated diabetic patients to understand their condition and adhere effectively to treatment. In our study, people in work reported a better quality of life than those without a profession (p=0.038). These results are in line with those reported in the literature [14,15,16,19]. Indeed, people in employment generally have a better socio-economic and cultural status, enabling them to take better care of themselves. According to our study, the length of time patients have had diabetes is significantly associated with their quality of life (p =0.002), which is in line with the results of the majority of studies found in the literature [15,16,17,20]. This may be explained by the occurrence of chronic complications of diabetes. On the other hand, Clouet's study found no significant link [19].

Our results concluded that there was a highly significant link between the existence of comorbidities and quality of life. They are in line with the results of the Papadopoulos study in Greece [40]. In contrast, the Kazemi study in Iran found no significant link [20]. The majority of other studies did not analyze this parameter [17,18]. According to our results, there is a significant link between the complications of diabetes (heart attack, stroke, hypoglycemia, ketoacidosis) and quality of life. This is in line with the literature, which confirms that the presence of complications is associated with a deterioration in quality of life [14,16,19]. In our study, compliance with dietary hygiene measures was significantly associated with a better generic quality of life for both scores (PCS-12, MCS-12). Treatment with antihyperglycemic drugs NI and insulin were not significantly associated with the quality of life of diabetic patients, unlike the QUODIEM and

AUVERDIAM studies, which concluded that insulin therapy was associated with poor quality of life, explained by the fact that insulin therapy is associated with the severity of diabetes, particularly type 2 diabetes [21,22].

In addition to this, our study identified that the insulin therapy regimen with several injections is significantly associated with a lower mental summary score (p=0.034), given that this protocol is more restrictive than management with NI anti-hyperglycemic agents or with the use of insulin. Insulin therapy with fewer injections. Good knowledge of diabetic disease and therapeutic objectives was significantly associated with better physical (p=0.001) and mental (p=0.021) quality of life, in line with the results of the Polish study by Jankowska [18].

CONCLUSION

Assessing health-related quality of life has become essential for improving patient care, particularly for patients with chronic diseases such as diabetes. Numerous tools have been developed to measure health-related quality of life. Our work has made it possible to evaluate the generic quality of life "SF-12", and to highlight the sociodemographic and diabetes-related factors that influence the quality of life of diabetic patients. It also made it possible to determine certain parameters which have an impact on the quality of life of diabetic patients followed at the Marrakech HMA, in particular age, sex, co-morbidities, age of onset, age of diabetes and complications (CVA, MI). Thus, we can suggest that good control of the disease, the fight against cardiovascular risk factors, the implementation of educational programs and the monitoring of hygienic and dietetic measures as part of an organized and multidisciplinary management of diabetes will significantly reduce the intensity and severity of complications, the cost of the disease and improve the quality of life of diabetic patients.

Declaration of links of interest: The authors declare that they have no links of interest.

REFERENCES

1. International Diabetes Federation. (2017). IDF Diabetes Atlas, 8th edn. Brussels, Belgium:International Diabetes Federation. http://www.diabetesatlas.org
2. WHO. (2021). Diabetes: Country profiles in 2021. http://www.who.int/diabetes/country-profiles/mar_en.pdf?ua=1
3. Wens, J., Sunaert, P., Nobels, F., Feyen, L., Van Crombruggen, P., Bastiaens, H., & Van Royen, P. (2007). Recommandations de Bonne Pratique: Diabete sucré de type 2. *Société scientifique de médecine générale*.
4. Brousse, C., Boisaubert, C. (2007). "Quality of life and its measures". 2006. *La revue de médecine interne*, *28*(7).
5. Auquier, P., Simeoni, M. C., & Robitail, S. (2006). Mesurer la qualité de vie: effet de mode ou véritable critère de jugement?. *Revue neurologique*, *162*(4), 508-514.
6. Gandek, B., Ware, J. E., Aaronson, N. K., Apolone, G., Bjorner, J. B., Brazier, J. E., ... & Sullivan, M. (1998). Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. *Journal of clinical epidemiology*, *51*(11), 1171-1178.
7. Garratt, A. M., Schmidt, L., & Fitzpatrick, R. (2002). Patient-assessed health outcome measures for diabetes: a structured review. *Diabetic Medicine*, *19*(1), 1-11.
8. Ware Jr, J. E., Kosinski, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Medical care*, 220-233.
9. Diabetes", On wikimedi.ca, 18 June 2018 (consulted on 24 October 2018).
10. Kishore, P. "Diabetes mellitus," at www.merckmanuals.com (accessed 24 October 2018)
11. DZA_D1_guide diabète de bonnes pratiques en diabètologie 21x15 cm 151020.pdf
12. Butler, A. E., Janson, J., Bonner-Weir, S., Ritzel, R., Rizza, R. A., & Butler, P. C. (2003). β-cell deficit and increased β-cell apoptosis in humans with type 2 diabetes. *Diabetes*, *52*(1), 102-110.
13. Diabetes | PAHO/WHO | Pan American Health Organization https://www.paho.org/fr/sujets/diabete (accessed June 4, 2022).
14. Wehbe, M. (2004). "The quality of type 2 diabetics". Université Saint-Joseph.Faculte Des Sciences Infirmieres.
15. Entred. (2007). Quality of life in type 2 diabetic patients living in metropolitan France: multiple factors associated". ENTRED 2007
16. Papadopoulos, A. A., Kontodimopoulos, N., Frydas, A., Ikonomakis, E., & Niakas, D. (2007). Predictors of health-related quality of life in type II diabetic patients in Greece. *BMC Public Health*, *7*(1), 1-9.
17. Shaheen, F. (2012). Health related quality of life in patients with diabetes using SF-12 questionnaire.
18. Jankowska, A., & Golicki, D. (2022). Self-reported diabetes and quality of life: findings from a general population survey with the Short Form-12 (SF-12) Health Survey. *Archives of Medical Science*, *18*(5), 1157-1168.
19. Clouet, F., Excler-Cavailher, G., Christophe, B., Masson, F., & Fasquel, D. (2001). Type 2 diabetes and short form 36-items health survey. *Diabetes & metabolism*, *27*(6), 711-717.
20. Kazemi-Galougahi, M., Ghaziani, H., Ardebili, H., & Mahmoudi, M. (2012). Quality of life in type 2 diabetic patients and related effective factors. *Indian journal of medical sciences*, *66*(9/10), 230.

21. Abouothman, S. (2014). Évaluation de la qualité de vie des patients diabétiques de type 2 au niveau de la région de Marrakech. *University Cadi Ayyad, Faculty of Medicine and Pharmacy, Marrakech*.

22. Cornet, C., & Bonnement, C. (2002). Evaluation de la qualité de vie des diabétiques de type 2 et équilibre du diabète " étude AUVERDIAM ".