



Quality of Life among Patients with Hypothyroidism in a Morocco: A Cross-Sectional Study

Soumaya Benmaamar^{1*}, Nada Lazar², Ibtissam El Harch¹, Bineta Jho Diagne¹, Imad Chakri¹, Mohammed Omari¹, Moncef Maiouak¹, Noura Qarmiche¹, Nada Otmani¹, Houda Salhi², Mohamed Berraho¹, Samira El Fakir¹, Hanan El Ouahabi², Nabil Tachfouti¹

¹Department of Epidemiology, Clinical Research and Community Health, Faculty of Medicine and Pharmacy of Fez, Sidi Mohamed Ben Abdellah University, Fez, Morocco

²Department of Endocrinology, Hassan II University Hospital of Fez, Fez, Morocco

Email: *soumaya.benmaamar@usmba.ac.ma

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Abstract

Hypothyroidism is a chronic disease resulting in a multiplicity of symptoms that can affect the physical and mental quality of life of patients. The aim of the present study was to assess the quality of life in these patients and to identify the factors associated with its deterioration. This is a cross-sectional study carried out in 2019-2020 at the Endocrinology Department at Chu Hassan II in Fez in Morocco. The assessment of the quality of life was based on the SF12 score, which allows to calculate two scores: mental and physical. Multiple linear regressions were used to determine factors associated with quality of life by adjusting for confounding factors. A total of 80 hypothyroid patients were included in the study, 80% were female. The mean age of the patients was 50.53 ± 13.16 years. The mean physical score was 41.20 ± 10.23 and the mean mental score was 42.65 ± 10.79 . The alteration of physical and mental score was associated with the presence of symptoms of hypothyroidism and comorbidities. Quality of life was not associated either with the socio-demographic profile of the patients or with thyroid function (TSH values). Our study showed that the quality of life of the hypothyroid patients was negatively affected by having symptoms and comorbidities. It is therefore imperative to integrate the assessment of quality of life into the management strategy for this pathology.

Subject Areas

Diabetes & Endocrinology

Keywords

Comorbidities, Hypothyroidism, Quality of Life, SF12, Symptoms

1. Introduction

Hypothyroidism is defined as “failure of the thyroid gland to produce sufficient thyroid hormone to meet the metabolic demands of the body” [1]. It is an important cause of morbidity. The prevalence of spontaneous hypothyroidism is between 1% and 2% and the mean annual incidence is 3.5 per 1000 and 0.6 per 1000 in women and men, respectively [2]. In Morocco, according to the population and family health survey (2003-2004) [3], the prevalence was 0.5%.

The World Health Organization (WHO) defined QOL as “An individual’s perception of their position in the life in the context of the culture in which they live and in relation to their goals, expectations, standards and concerns” [4]. It has become established as an important element in the management of chronic diseases. Several studies have found that the quality of life is impaired in hypothyroid patients [5].

Thyroid hormone receptors regulate the physiology of many organs. As a result, hypothyroidism can lead to a myriad of clinical symptoms. Mood and emotional disturbances such as depressive syndrome and anxiety are common in patients with hypothyroidism. A meta-analysis reported that the risk of depression is nearly 2.5 times higher in adults with hypothyroidism, compared to their euthyroid counterparts [6]. Another systematic review and meta-analysis showed that 23.8% of patients with Autoimmune Thyroiditis experience depression and 41.6% of them experience anxiety disorders [7]. These psychiatric disorders can significantly affect the mental health of patients.

Other somatic symptoms that lead to significant reductions in physical health such as; physical and intellectual fatigue, hypothermia, cramps and muscle pain, are commonly reported by many patients with hypothyroidism [8]. Patients with hypothyroidism may also experience a decrease in quality of life related to weight gain. Bad quality of life and mental health conditions, including depression, and anxiety often co-occur with obesity [9].

In addition, the depilation, hair and eyebrow loss, dry skin and brittle nails are a source of discomfort and cosmetic problems especially in women, which can also affect the quality of life.

Finally, women who have hypothyroidism may present menstrual irregularities and infertility. Infertility is a stressful condition that influences all aspects of affected couple’s life and has a considerable impact on the quality of life: Impaired mental, physical, social and personal aspects along with waste of time and money, marital disruption and divorce [10].

The evaluation of the quality of life is important in hypothyroidism; it is one of the elements that allow to judge the effectiveness and the quality of the pa-

tient's care. However, there are no data regarding the quality of life in Moroccan patients with hypothyroidism, hence the interest of the present study. The aim is to assess the quality of life of hypothyroid patients and identify the factors associated with its deterioration.

2. Methods

2.1. Study and Population

A cross-sectional study was conducted at Hassan II University-Hospital of Fes over a period of 12 months, from the November 2019 to November 2020 were included adult's patients with a confirmed diagnosis of hypothyroidism. We excluded patients with impairment from auditory, mental and cognitive related medical conditions and pregnant woman.

2.2. Data Collection and Scoring

Data collection was carried out using an anonymous face to face questionnaire comprising:

The socio-demographic variables: age, gender, marital status, education level, employment status, residence and monthly income.

Clinical variables: medical and surgical history, characteristics of hypothyroidism: duration of disease, type, symptoms, treatment and thyroid stimulating hormone level (TSH).

For assessment of quality of life, a shortened form of SF36 questionnaire (SF 12) in its translated and validated Moroccan version [11] was used. The SF-12 is a questionnaire for measuring health-related quality of life. It consists of twelve questions that measure eight domains of physical and mental health. The physical health domains include: General Health (GH), Physical Functioning (PF), Physical Role (PR) and Body Pain (BP). Scales related to mental health include: Vitality (VT), Social Functioning (SF), Emotional Role (ER), and Mental Health (MH). The total physical and mental quality of life scores range from 0 to 100, with higher scores corresponding to better quality of life.

2.3. Statistical Analysis

For each participant, we calculated two summary scores of the SF-12 physical and mental health using the weighted means of the eight domains. Frequencies were used for qualitative variables. Means and standard deviations (mean \pm SD), were used for quantitative variables. Student's test and ANOVA, were used to test associations between scores of quality of life and qualitative variables. For associations between scores of QOL and age, duration of hypothyroidism, and TSH levels, Pearson correlation, was used. Multivariate analysis by multiple linear regressions was used to identify factors associated with the quality of life scores, adjusting for confounding factors. Factors having a p-value \leq 0.2 in bivariate analysis were included in the model. In all the analyses, the level of significance was kept at <0.05 . Statistical analyses were performed by using R software.

2.4. Ethics Statement

Ethical approval was obtained from the ethics committees of Hassan II University Hospital, Fez-Morocco. All participants were informed of the conditions related to the study and gave their informed consent.

3. Results

3.1. Socio-Demographic Characteristics

In total, 80 subjects were included in the study. The average age of the study participants was 50.53 ± 13.16 years, 80% were females, 62.5% were married, more than half (56.3%) were illiterate, 87.5% were unemployed or retired, 66.3% hailed from urban area and 78.8% have a monthly income under 2000DH (**Table 1**). Baseline characteristics of patients are summarized in **Table 1**.

3.2. Clinical Characteristics of Participants

The majority of participants were diagnosed with hypothyroidism post thyroidectomy (87.8%). The mean duration of hypothyroidism diagnosis was 7.5 ± 6.2 years, while the mean TSH us measurement was 5.5 ± 9.9 mIU/L. regarding symptoms of hypothyroidism, 55.0% had more than 3 symptoms. Fatigue was the main symptom presented in our patients, it was present in 73.8% of patients followed by cramps and swarming (61.3%) and memory and concentration problems (43.8%). Depressive disorders were present in 37.5% of subjects. 51.5% of patients had comorbidity. Almost all of patients (96.3%) were on levothyroxine therapy and 3.8% were on surveillance. Clinical characteristics of participants are summarized in **Table 1**.

3.3. Quality of Life

The mean of physical score (PCS) was 41.20 ± 10.23 . The domains most affected in terms of physical quality of life were role physical (37.36 ± 9.95) and general health (37.59 ± 10.81).

The score of Quality of life is described in **Table 2**.

In bivariate analysis, there was a statistically significant relationship between physical score, and fatigue, depressive disorders, memory and concentration problems and comorbidities ($p < 0.05$). After consideration of confounding factors, variables reminding associated with PCS in multivariate regression analyses were: fatigue ($\beta = -5.35$, $95\%CI (-10.03, -0.68)$), comorbidities ($\beta = -5.68$, $95\%CI (-9.77, -1.59)$) and depressive disorders ($\beta = -6.68$, $95\%CI (-10.98, -2.40)$). There was no statistically association between socio demographic, socio economic data, thyroid function and physical quality of life. **Table 3** shows the bivariate and multivariate analysis on factors associated with physical score of SF-12.

The mean of mental score (MCS) was 42.65 ± 10.79 . The mental quality of life was more impaired in the domains of emotional role (37.76 ± 10.14) and mental health 40.15 ± 11.18 .

Table 1. Socio-demographic and clinical characteristics of 80 Moroccan hypothyroid patients, 2019-2020.

Socio-demographic variables	N (%)
Gender	
Male	8 (10.0)
Female	72 (90.0)
Age (Mean \pm SD)	50.53 \pm 13.16
Residence	
Rural	27 (33.8)
Urban	53 (66.3)
Profession	
Unemployed or retired	70 (87.5)
Employed	10 (12.5)
Education level	
Illiterate	45 (56.3)
Primary	16 (20.0)
Secondary or superior	19 (23.8)
Marital status	
Single	13 (16.3)
Married	50 (62.5)
Divorced or widow	17 (21.3)
Monthly income (Moroccan dirham)	
\leq 2000	63 (78.8)
$>$ 2000	17 (21.2)
Clinical Variables	
Duration of disease (mean \pm SD)	7.54 \pm 6.27
Comorbidity	
No	39 (48.8)
Yes	41 (51.3)
Symptoms of hypothyroidism	
weight gain	27 (33.8)
Concentration and memory problems	35 (43.8)
Fatigue	59 (73.8)
Feeling cold	23 (28.8)
constipation	30 (37.5)
Cramps/swarming	49 (61.3)
Cardiovascular	6 (7.5)
Menstrual irregularities/infertility	10 (12.5)
Depressive symptoms	30 (37.5)
Number of symptoms	
\leq 3	36 (45.0)
$>$ 3	44 (55.0)

Continued

Etiology	
Post thyroidectomy	63 (78.8)
Autoimmune/other	17 (21.3)
Levothyroxine	
No	3 (3.8)
Yes	77 (96.3)
TSH us level (mean ± SD) (mIU/L)	5.5 ± 9.9

SD: standard deviation. TSH: thyroid stimulating hormone.

Table 2. Description of quality of life in Moroccan hypothyroid patients, 2019-2020.

Domains of score SF12	Mean ± SD
Physical function	42.61 ± 9.41
Role physical	37.36 ± 9.95
Body pain	41.64 ± 15.79
General health	37.59 ± 10.81
Social function	45.46 ± 11.98
vitality	48.75 ± 11.04
Role emotional	37.76 ± 10.14
Mental health	40.15 ± 11.18
Physical score PCS	41.20 ± 10.23
Mental score MCS	42.65 ± 10.79

SD: standard deviation.

Table 3. Factors associated with physical score of QOL in 80 Moroccan hypothyroid patients, 2019-2020: Results of bivariate and multivariate analysis.

Variables	Mean ± SD	p-value	Adjusted β (95%CI)
Fatigue		0.007	
Yes	39.39 ± 10.38		-5.35 (-10.03, -0.68)
No	46.29 ± 8.01		reference
Concentration and memory problems		0.009	
Yes	37.87 ± 11.42		-
No	43.79 ± 8.47		-
Cardiovascular problems		0.09	
Yes	34.52 ± 14.95		-
No	41.74 ± 9.69		-
Weight gain		0.19	
Yes	39.12 ± 12.21		-
No	42.26 ± 9.00		-

Continued

Depressive symptoms		0.003	
Yes	36.96 ± 11.09		-6.68 (-10.98, -2.40)
No	43.75 ± 8.85		reference
Number of symptoms		0.19	
≤3	42.87 ± 7.99		-
>3	39.84 ± 11.67		-
Comorbidities		0.025	
Yes	38.72 ± 10.72		-5.68 (-9.77, -1.59)
No	43.81 ± 9.10		reference
TSH levels (mIU/L)		0.68	
	-0.05*		-

*Correlation coefficient. SD: standard deviation. TSH: thyroid stimulating hormone. CI: confidence interval.

The alteration of mental score was associated with presence of fatigue ($p = 0.033$), constipation ($p = 0.033$) and depression ($p < 0.0001$). The mental QOL was not associated with the thyroid function (TSH) and with socio demographic and socio economic data. **Table 4** shows the bivariate analysis on factors associated with mental score of SF-12.

4. Discussion

Our study, the first in our knowledge, aimed to explore the quality of life of hypothyroidism patients in Morocco. Our data showed that patients with hypothyroidism experienced mental and physical QOL reductions. The findings of the present study agree with previous reports [12] [13] [14] [15] [16]. However, other studies prove no worsening in quality of life in patients with hypothyroidism [17] [18]. The reason for these varieties could be the difference in study population and the use of different scales for evaluation of QOL.

The QOL of Moroccan patients with hypothyroidism was affected by their thyroid symptoms. Ngiap Chuan Tan *et al.* [12] related that the presence of weight gain, fatigue, feeling weak, having dry or coarse skin, leg swelling contribute to poor QOL among Asian patients with hypothyroidism. Vigario *et al.* [19], noted a relation between less favourable health status scores and the presence of clinical signs in patients with hypothyroidism. A study by Bianchi *et al.* [13] has revealed that the reduced QOL of patients with hypothyroidism is often related to fatigue and psychiatric disturbances.

Similar to the previously reported results [12] [19] [20], we found that the presence of comorbidity related to lower score of QOL. As in all chronic diseases, comorbidities have a negative effect on the quality of life of patients. They contribute to physical, functional and psychological disability, and they also limit social relationships, consequently reducing the quality of life.

Our data showed that QOL in patients with hypothyroidism was not affected

Table 4. Factors associated with mental score of QOL in 80 Moroccan hypothyroid patients, 2019-2020: Results of bivariate analysis.

Variables	Mean ± SD	p-value
Number of symptoms		0.067
≤3	45.09 ± 11.43	
>3	40.66 ± 9.93	
Fatigue		0.033
Yes	41.12 ± 11.18	
No	46.96 ± 8.42	
Cramps and swarming		0.14
Yes	41.24 ± 10.29	
No	44.88 ± 11.35	
Constipation		0.033
Yes	39.34 ± 10.47	
No	44.64 ± 10.59	
Depressive symptoms		<0.0001
Yes	34.56 ± 8.44	
No	47.51 ± 9.02	
Comorbidities		0.12
Yes	44.45 ± 11.15	
No	40.77 ± 10.20	
TSH levels (mIU/L)	0.19*	0.11

*Correlation coefficient, SD: standard deviation, TSH: thyroid stimulating hormone.

by TSH levels. The results are compatible with the findings from other studies [12] [20] [21], which also reported the lack of relationship between TSH levels and the QOL score of patients with hypothyroidism. This result may be explain by that hypothyroidism patients continue to have symptoms despite normal thyroid hormone levels [22]. Two randomized, double-blind clinical trials [23] [24] analyzed the effect of titration of the dose of levothyroxine, in order to obtain TSH values in the normal range, on the quality of life of patients with hypothyroidism. Normal TSH values were not associated with higher measures of well-being, quality of life, mood or cognitive function.

Socio demographic and economic, aspects may affect QOL. In our study, although, different variables were assessed, such as educational level, employment status, marital status, and monthly income, we found no relation with QOL in hypothyroid patients. This results are in line with others studies [16] [18].

This study is first of its kind that had reported the quality of life in hypothyroidism patients in Morocco. Our subjects were heterogeneous in terms of clinical and socio demographic characteristics. However, our study presents a limitation, which is the small sample size. Due to the context of the COVID 19 pan-

demographic, recruitment of more patients was difficult.

5. Conclusions

In conclusion, our study showed that the mental and physical quality of life of the hypothyroid patients was altered. This alteration is primarily associated with the presence of symptoms (fatigue, memory and concentration problems, constipation, and depressive disorders) and the presence of comorbidities.

In this instance, its improvement should be the target of clinicians who are monitoring patients.

Researchers should pay closer attention to QOL studies in these patients for more improvements in this field.

It is also necessary to introduce the aspect of QOL in the teaching of this pathology for medical students.

Conflicts of Interests

The authors declare that they have no competing interest.

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