

Quality of Life in Outpatient Primary Hypothyroidism in Riyadh

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ABSTRACT

Objective: To estimate the Primary Hypothyroidism and to study its effects on the Quality of Life of those patients.

Study design: It was a Cross-Sectional Study done using random sampling.

Sample size: 463 patients

Duration and location of the study: It was done between December 2018 and December 2019 in outpatient clinics of a tertiary care hospital in Riyadh. Study tool: The quality of life of these patients was assessed by World Health Organization (WHO) Health Survey 36-Item Short Form (SF-36) questionnaire with a score less than 50% was considered to be 'Poor quality'.

Results: The response rate of participants was 92.6% and the prevalence of Primary Hypothyroidism was observed to be 47.8%. They experienced a poor mental health with an average score (35.1 ± 1.6). Factors such as illiteracy (35.0 ± 1.0), primary level of education (29.4 ± 3.6), housewife (43.49 ± 38.19) and the retired patients (20.31 ± 37.88) had a poor Physical function ($P=0.001$). However, the patients without primary hypothyroidism had better quality of life with physical, social and mental functional scores ($P=0.001$). The statistically significant poor quality of life observed due to poor education, income level and marital status exposed the need for the guidelines and management of this morbidity in the Saudi community.

Keywords: Primary Hypothyroidism, SF-36, Quality of Life, Cross-Sectional study

INTRODUCTION

Hypothyroidism is considered to be the most common thyroid disorder, worldwide¹. Approximately 4.6% of the USA population are suffering of hypothyroidism according to the National Health and Nutrition Examination Survey (NHANES III)². Hypothyroidism cases reached up to 10% in Saudi Arabia³. Hypothyroidism is defined as an insufficiency of the thyroid hormone that regulates and maintains the metabolic demands of the body and is categorized as primary or secondary^{4,5}.

Primary hypothyroidism is an insidious condition with a significant morbidity and often subtle and nonspecific symptoms & clinical signs and further classified as clinical (overt) or subclinical⁶. Overt hypothyroidism is diagnosed by the presence of clinical features, levels of thyroid-stimulating hormone (TSH) above the reference range (normal range: approximately 0.5 to 4.5 μ U per ml [0.5 TO 4.5 μ U PER l]), due to reduced levels of triiodothyronine or thyroxine (T3 or T4)⁵. On the other hand, subclinical hypothyroidism has serum TSH above the reference range but there is no overt presentation of symptoms of thyroid dysfunction⁶. It might occur as a result of congenital abnormalities, autoimmune destruction like Hashimoto disease, iodine deficiency or infiltrative diseases⁵.

Primary hypothyroidism can cause various physiological and psychological symptoms that can have a substantial negative impact on the quality of life (QOL)^{7,8}. Hypothyroidism may cause psychological symptoms like anxiety, memory decline, somatic complaints, poor concentration and depression; which may deteriorate the well-being of an individual⁹. The main physiological symptoms of hypothyroidism are fatigue, weakness and myalgia; which also can result in the decline of function and productivity of the affected patients^{4,5}. The above mentioned clinical manifestations contribute to infirmity not only through physical and psychological impairments but also by placing limitations on social relationships and thereby poor QOL, health status and well-being¹⁰.

Many studies referred to the Medical Outcome Study Health Survey 36-Item Short Form (SF-36) as a valuable measure to assess the quality of life among hypothyroidism patients^{9,10,12-14,20}. Gulseren et al. study used SF-36 tool to assess the changes of QOL, psychological symptoms in patients with different types of

thyroid diseases before and after the treatment⁹. It concluded that patient's compliance with treatment had substantial positive changes in physical composite score and mental composite score on the SF-36 scale and great impact on their QOL⁹. The SF-36 measured in a multi-disciplinary lifestyle interventions study that implement health program of protocol diet with nutrients essential for thyroid functioning among hypothyroid participants and showed significant improvement in the physical role functioning, emotional role functioning, and general health subscales after multi-week of observation²⁰.

Although many studies conducted among primary hypothyroidism patients are focused on clinical outcomes, there is little known about the Saudi Arabian patients' psychological, physical and socioeconomic aspects. Moreover, patients' perception toward mental, physical, and social health factors associated with thyroid dysfunction relies on several socioeconomic factors like their level of education and availability of healthy environment. Understanding these factors can have an impact on the QOL and the long-term health outcome in patients with primary hypothyroidism.

Aim: was to assess the effect of primary hypothyroidism disease on the Quality of Life(QOL) including physical, social and mental health along with the effect of socioeconomic parameters on these functions in Saudi Arabia. The results of this study could help empower family medicine doctors, endocrinologists, and public health leaders to have a deeper understanding of the above-mentioned issues.

METHODOLOGY

The Cross-Sectional study was carried out from December 2018 to December 2019 in a large tertiary care hospital - King Saud Medical City (KSMC), Riyadh, Saudi Arabia. The minimum required sample size was calculated to be 377 with a stipulated 95% power, 5% margin of error, $\alpha = 5\%$ and a prevalence (p) of 50% (www.raosoft.com).

Participants using medications like lithium, rifampicin, amiodarone, that could cause thyroid hormone dysfunction, patients who were hospitalized or had a history of diseases that could affect thyroid hormone secretion e.g., Addison disease,

sarcoidosis, hemochromatosis were excluded 5. The patients were screened from the medical records.

The participants were adult diagnosed with primary hypothyroidism by family medicine and endocrine consultants in their respective outpatient clinics were randomly selected and personally interviewed during their follow-up visits. A compared control group was adult patients with no history of primary hypothyroidism of the same characteristics.

The participants were selected randomly using the online generated random numbers [www.researchrandomizer.com] and the informed consent were obtained from the participants before data collection. The authors personally interviewed them by validated Arabic version of the SF-36 questionnaire 15. The Medical Outcomes Study 36 – Item Short-Form Health Survey has 36 items divided into eight domains which include physical functioning, the physical aspects of role functioning, bodily pain, general health perceptions, vitality, social functioning, emotional aspects of role functioning and mental health 15. "Physical Functioning" implies the limitations in physical activities because of health problems, "Physical Role Functioning" implies the limitations in usual role activities because of physical health problems, "Social Functioning" implies limitations in social activities because of physical or emotional problems, and "Mental Health" implies psychological distress and well-being. Score of "0" means lowest score of poor health and "100" means highest score of good health with cutoff score of 50%.

Statistical Analysis: Data were analyzed using SPSS (IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp) 19. The items in the SF-36 were scored and computed as the transformed scale for different domains of physical, social and mental health. Student t-test was used for the difference between two groups and ANOVA test was used for comparing the mean differences of more than two groups. Pearson coefficient of correlation was estimated between all the 8 domain scores. Chi-square test was used to measure associations between the categorical variables. The Univariate and Multivariate Logistic Regression models were formulated based on all the mean scores of 8 domains. Differences were considered statistically significant at 5% level.

RESULTS

In the present study, out of the 500 participants selected for this study, only 463 agreed to participate, resulting in a response rate of 92.6%. Of all the participants enrolled in the study, 221(47.8%) had primary hypothyroidism while 242(52.2%) were considered to be non-primary hypothyroidism patients.

Table 1 presents the descriptive statistics of the demographic information of study participants, 57.1% were females (n = 264) and 42.9% were males (n=198). The median age of the patients was 34 years with the interquartile range (IQR) 25-51year and the median BMI was 26.6 with IQR 22.6 to 30.8 respectively. Majority of the participants had completed high school and/or undergraduate education, with 26.6% being employed in a non-health care sector, 25.9% were students and 23.6% housewives at the time of study.

Figure 1 displays an overall comparison of mean scores between primary hypothyroidism and the non-hypothyroidism. The physical functional scores of the cases were comparatively lesser than the controls (t=4.12, (P-value=0.001)), a large difference was noticed

in physical activities (t=6.092; P=0.0011), there was significantly limited social role function among cases compared to controls (t=3.672; P-value=0.001) and the mental health was slightly poor (t-statistic 3.679; P=0.001) among cases.

Figure 2 illustrates that majority (53.8%) of the patients were found to be chronically ill for more than 5 years of primary hypothyroidism.

Table 2 shows the physical, social and mental domains of SF36 and its association with socioeconomic parameters of 221 primary hypothyroidism patients. There was statistically significant decline in the physical functions among the Illiterate, Primary, Secondary level (F=3.88; P= 0.001) and a deterioration in Physical role function among the primary, diploma and postgraduate holders (F=2.81; P=0.012) in regard to the patient's level of education. The social and mental function domains did not show much significant differences in scores relative to education level.

Occupation played a significantly declined role in the Physical functioning especially among retired patients (F =12.912, P=0.001), Physical activities among the retired, housewife & unemployed (F=6.545, P=0.001) and a diminished Social role play among retired (F=3.785, P=0.003). We observed not much difference in the mental health between occupation categories, as well their scores were very much around the borderline of 50 (F-value= 0.579, P-value is 0.71).

The patients who were earning more than SAR10,000/- per month had a very poor Physical activity (F=2.507; P=0.031), but a difference was observed in Physical function (F=3.724; P= 0.003), more restricted activities in the social domain (F=2.609; P=0.026) and no statistically significant difference in the mental health scores (F=1.508; P=0.189).

The marital status of the primary hypothyroid patients showed a statistically significant difference in physical domains (F value= 16.918; P-value is <0.001), (F value= 9.133; P-value < 0.001); and social domain (F value= 7.703; P-value < 0.001). The mean of physical and social domains presented lower score among the primary hypothyroid patients with widow status. In the mental health domain, there was no statistically significant difference in scores with regard to the patients' marital status (F value= 1.595; P-value = 0.177).

Positive high correlation (r=0.78, P=0.000) was seen between body pain and social role function, body pain with physical role function (r=0.653, P=0.000) and a very mild significant correlation observed between mental health and rest of the domains. Among all the domains, mean score of vitality of the patients were found to be very low.

Table 3 presents the results of univariate and multivariate logistic regression models. Considering the presence of Primary hypothyroidism (Yes/No) the odds ratio were estimated for individual domain independently by univariate logistic regression model. We observed four main domains were significantly affecting the morbidity. From the univariate model, we perceive the cases had 1.86 times risk of changes in Physical functions (P=0.013), 2.74 times risk of reduced Physical role function (P=0.000), 1.6 times risk of limited social role function (P=0.014) and 1.46 times risk of diminished Mental health (P=0.050) compared to the control group. All these 4 domain scores were now incorporated in the Multivariate logistic regression and we noticed the primary hypothyroidism patients had 2.71 times (P=0.000) difficulty in the Physical Role functions compared to the control group.

Table 1: Demographic data of the study population

Variable	N(%)	Variable	N(%)
Gender: Female	264(57.1)	Income per month (SAR):	21(4.5)
Male	198(42.9)	<225/-	98(21.2)
Education (completed years):	4(0.9)	225/- to 1000/-	158(34.2)
Illiterate	21(4.5)	1000/- to 5000/-	84(18.2)
Primary	63(13.6)	5000/- to 10000/-	96(20.8)
Secondary	165(35.7)	>10,000/-	172(37.2)
High School	23(5.0)	Marital Status: Single	224(48.5)
Diploma	150(32.5)	Married	28(6.1)
Undergraduate	34(7.4)	Widow	21(4.5)
Post graduate	38(8.3)	Divorced	17(3.7)

Occupation (present):	10(2.2)	Separated	119(25.8)
Unemployed	123(26.6)	Smoker: Yes	340(73.6)
Employed - Healthcare	120(25.9)	No	11(2.4)
Employed - Others	109(23.6)	Alcoholic: Yes	450(97.4)
Student	41(8.9)	No	
Housewife			
Retired			

Table 2: Physical, social and mental health domains of SF36 in relation to the socioeconomic parameters of 221 primary hypothyroid patients

SEC Parameters	Physical Function Mean ± SD (95% CI)	Physical Role Function Mean ± SD (95%CI)	Social Function Mean ± SD (95% CI)	Mental Health Mean ± SD (95% CI)
*Level of education	35.00±10.00 (10.16-59.84)	41.66±38.19 (53.19-136.53)	50.00±37.50 (43.15 -143.15)	50.66±6.11 (35.48-65.84)
Illiterate	60.59±30.36 (44.98-76.19)	29.41±39.76 (8.96-49.85)	61.03±28.26 (46.50 - 75.55)	53.65±16.79 (45.01 - 62.28)
Primary	66.80±26.89 (57.70-75-.90)	41.67±43.09 (27.08-56.24)	56.25±3.10 (46.06 - 66.43)	51.89±20.11 (45.08 - 58.69)
Secondary	78.54±23.43 (72.73-84.34)	62.69±37.01 (53.52-71.86)	64.23±23.89 (58.31-70.15)	54.21±18.08 (49.73-58.69)
High School	58.00±24.96 (40.14-75.86)	37.50±39.53 (9.22-65.77)	55.00±33.43 (31.08-78.91)	56.40±17.93 (43.57-69.22)
Diploma	74.87±19.98 (70.30-79.43)	57.56±38.94 (48.66-66.46)	56.90±26.01 (50.96 - 62.85)	54.05±16.41 (50.30 - 57.80)
Undergraduate	75.00±22.10 (62.24-87.76)	41.07±44.51 (15.37-66.77)	66.96±26.67 (51.56-82)	59.43±20.14 (47.79-71.05)
Postgraduate	(P=0.001)*	(P=0.012)*	(P=0.54)	(P=0.91)
*Occupation	74.79±20.29 (66.22-83.36)	57.29±42.01 (39.55-75.03)	60.41±22.62 (50.86-69.96)	56.50±16.48 (49.54-63.46)
Unemployed	90.00±7.07 (26.46-153.53)	75.00±00.00 (75.00-75.00)	56.25±8.83 (23.16- 135.66)	56.00±11.31 (45.64 157.64)
Employed-Healthcare	78.07±17.42 (73.75-82.39)	57.30±38.45 (47.77-66.83)	59.61±26.86 (52.95-66.27)	54.89±18.75 (50.24-59.53)
Employed – Others	90.46±14.50 (85.24-95.69)	78.12±31.59 (66.73-89.51)	74.60±23.86 (66.00-83.21)	56.87±19.90 (49.69-64.05)
Student	64.58±26.33 (58.44-70.73)	43.49±38.19 (34.58-52.40)	58.21±26.37 (52.06-64.37)	51.78±17.20 (47.76-55.79)
Housewife	45.31±24.04 (32.49±58.12)	20.31±37.8 (80.13-40.49)	41.40±28.03 (26.47-56.34)	57.00±15.83 (48.56-65.43)
Retired	(P=0.000)*	(P=0.000)*	(P=0.003)*	(P=0.71)
*Income/month (Riyal)	81.78±18.67 (71.01 - 92.56)	53.57±46.88 (26.50-80.63)	76.78±21.29 (64.49-89.07)	50.86±18.19 (40.35-61.36)
<225	82.62±21.48 (75.75-89.49)	70.62±35.75 (59.19-82.06)	67.50±22.78 (60.21-74.78)	58.40±16.35 (53.17-63.62)
225 to 1000	65.60±26.29 (60.13-71.08)	44.50±39.05 (36.37-52.63)	54.80±29.03 (48.75-60.86)	51.34±17.30 (47.73-54.95)
1000 to 5000	73.81±20.67 (67.02-80.61)	54.60±39.78 (41.53-67.68)	56.90±24.61 (48.82-64.99)	53.16±19.79 (46.65-59.66)
5000 to 10000	71.11±23.24 (63.25-78.97)	47.91±41.99 (33.70 -62.12)	59.72±25.37 (51.14-68.30)	58.33±15.28 (53.16-63.50)
>10,000	(P=0.003)*	(P=0.031)*	(P=0.026)*	(P=0.189)
*Marital Status	88.25±13.77 (84.69- 91.80)	74.58±33.97 (65.80-83.36)	73.54±21.35 (68.02-79.06)	57.53±17.95 (52.89-62.17)
Single	69.13±22.50 (65.08-73.18)	45.45±38.45 (38.53-52.37)	55.68±26.66 (50.88-60.48)	52.23±18.44 (48.91-55.55)
Married	42.50±29.33 (25.56-59.43)	17.85±28.46 (1.42-34.29)	39.28±29.76 (22.09-56.47)	49.42±12.90 (41.98-56.87)
Widow	60.00±28.21 (43.70-76.29)	50.00±47.02 (22.84-77.15)	60.71±24.93 (46.31-75.10)	60.28±15.23 (51.48-69.09)
Divorced	72.50±22.41 (58.26-86.73)	50.00±46.46 (20.47-79.52)	54.16±23.43 (39.27-69.05)	54.33±12.58 (46.33-62.33)
Separated	(P=0.000)*	(P=0.000)*	(P=0.000)*	(P=0.177)

*Statistically significant at 5% level

Table 3: Univariate and Multivariate Logistic Regression analysis of 462 patients under study

SF-36 Domain	Univariate Logistic Regression Odds Ratio (P-value)	Multivariate Logistic Regression Odds Ratio (P-value)
Physical Function	1.86 (0.013)*	1.14(0.649)
Physical Role Function	2.74 (0.000)*	2.71(0.000) *
Social Function	1.60 (0.014)*	0.88(0.595)
Mental Health	1.46 (0.050)*	1.23(0.314)

*Statistically significant at 5% level

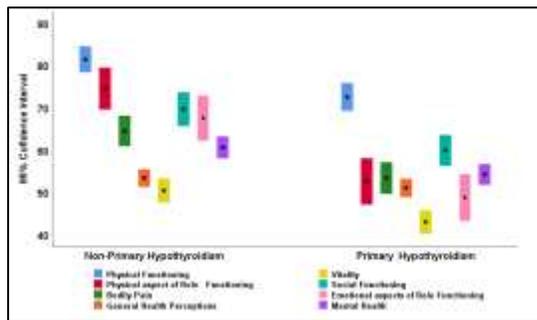


Fig 1: The Error bars of all the domains

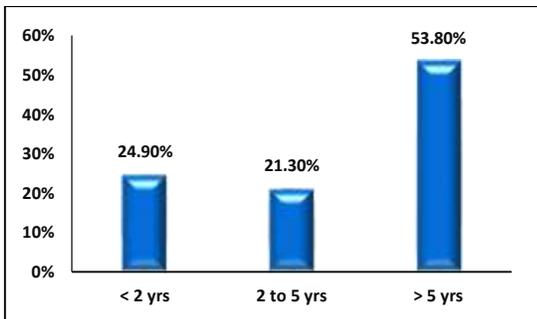


Figure 2: Duration of primary hypothyroid disease in the study population

DISCUSSION

Primary hypothyroidism might lead to poor physical, social and mental factors that negatively affect the quality of life ^{9,10,12}. The Patricia Vigário et al. study showed that patients with hypothyroidism have poorer scores in almost all domains of the SF-36, resulting in significant dissatisfaction with health status among this group ¹⁰. In the current study, primary hypothyroidism patients had lower scores in physical, social and mental functions in the SF-36 domains when compared to the non- primary hypothyroidism patients.

The findings in Figure 2 might explain the chronicity of primary hypothyroidism and its burden on physical, social and mental health functions among the hypothyroid patients. Hypothyroid manifestations also might play a major role in the deterioration of health status profile ¹⁰. Several psychological and physical problems, including neuromuscular dysfunction, weariness, and depression, have been linked to hypothyroidism. 4,9. Researchers Bianchi et al. found a correlation between fatigue and psychiatric symptoms and low quality of life scores in hypothyroid patients.¹⁴The present study outcomes were concurrent with previously published studies assessing the quality of life among primary hypothyroid patients ^{9,10,12-14}.

Nevertheless, there were only few studies that have described the socioeconomic status challenges among hypothyroid patients ^{9,10,12}. The current study revealed poor scores in physical, social and mental functions of the SF-36 among primary hypothyroid patients with their socioeconomic status. Physical function in relation to the low level of education was statistically

significant in the present study ($P=0.001$), while the Reuters VS et al. study showed an insignificant relationship ($P=0.105$). The sedentary lifestyle is common among Saudi population, and hence there is a need to increase the awareness of healthy lifestyle resources and their application in day to day life. Low income, unemployment and unhealthy relationship were other socioeconomic issues that showed statistically significant differences in the present study ($P=0.00$). To our knowledge, the present study was the first study that emphasized on socioeconomic factors related to physical, mental and social elements quality of life among primary hypothyroidism patients in Saudi Arabia.

The present study has several limitations. Primarily, the study findings were limited to one province of the country. Including the data from several regions would make the effort more meaningful. The present study used only one quality of life measurement and the authors would to include another quality of life tool like Hospital Anxiety and Depression Scale (HADs) for further psychological assessment. The authors recommend relevant family medicine and public health initiatives to make strategic plans to implement health programs that could improve the quality of life among primary hypothyroidism patients. Existing literature showed that physical exercise programs might show a great deal of improvement in the quality of life measurement^{17,18}. A study showed significant improvement of the SF36 quality of life scores after a well-constructed exercise program among hypothyroidism patients¹⁸. Encouraging physical exercise through health education messages in clinical settings or health education programs in campaigns carries the potential of improving the quality of life among these patients. More recreational public services like parks and sport activities in neighborhoods would help the housewives and retired people to have more access to exercise. Improving QOL would help in understanding the illness and seeking health care options. This, in turn, would facilitate the researchers and stakeholders' decisions to create more appropriate healthy environment options. Further studies are also needed to compare the methodology of the current study with other related studies in order to evaluate the improvement of the quality of life of hypothyroidism patients.

CONCLUSION

Primary hypothyroidism is a chronic disease with several physical and psychosocial burdens. Although these negative health manifestations are usually present, they can be controlled to help the patient have a better quality of life. The results of the current study showed poor scores in the quality of life, especially in physical, social and mental functions among primary hypothyroid patients compared to non-primary hypothyroid patients. The finding of present study might raise the issue of poor health literacy among Saudi population. The family medicine and public health stakeholders must be empowered to take efforts to implement effective health care programs and create policies to improve quality of life. Further research on this aspect of quality of life has the potential to advance family medicine as well as public health efforts to improve patients' well-being.

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