

Article

## Thyroid Dysfunction Study at Murjan Hospital, Hilla City

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**Abstract:** Thyroid dysfunction (TD) is a prevalent metabolic disorder globally, posing significant public health challenges. Despite its widespread impact, there remains a gap in understanding the diverse clinical and epidemiological characteristics of TD patients, particularly in Iraqi communities. This cross-sectional study, conducted at Murjan Hospital's diabetes and endocrinology center in Hilla City, Iraq, aimed to address this gap. A sample of 348 adult patients aged 18-76 years was surveyed using a standardized questionnaire over a five-month period. Findings revealed a predominance of females (92.8%) and urban residents (72.7%), with hypothyroidism comprising 78% of cases compared to 22% for hyperthyroidism. Common symptoms included tiredness (87%) and nervousness (91%). Statistical analysis showed no significant association between TD subtypes and socio-demographic factors. These results underscore the need for tailored interventions and heightened awareness to address the burden of TD within the Iraqi population.

**Keywords:** Thyroid Dysfunction, Hypothyroidism, Hyperthyroidism, Patients, Hospital

### 1. Introduction

The thyroid gland is a crucial part of the human endocrine system [1]. Thyroxine (T<sub>4</sub>) and triiodothyronine (T<sub>3</sub>), the main hormones synthesized by the thyroid gland, have influence on several physiological processes in the body, such as digestion, body temperature regulation, and essential indicators like respiration and heart rate [2]. Thyroid dysfunction, which includes both hyperthyroidism and hypothyroidism, can occur due to an imbalance in the control of hormones produced by the thyroid gland [3]. Hyperthyroidism occurs by excessive production of thyroid hormone by the thyroid gland, beyond the body's needs [4]. Hyperthyroidism is mainly caused by Graves' disease or toxic nodular goiter [5]. Hypothyroidism refers to the thyroid gland's failure to produce sufficient thyroid hormone to meet the body's metabolic needs [6]. Its causes include autoimmune such as Hashimoto's thyroiditis [7], dietary iodine deficit, past thyroid surgery or irradiation, use of medicines such as lithium, and pituitary and hypothalamic problems [8]. Infertility may be an outcome of hypothyroidism or hyperthyroidism. [9]

Thyroid problems are quite widespread worldwide, making them a common health condition [10]. There is a global population of about 2 billion individuals suffering from iodine deficiency (ID), with approximately 50 million experiencing noticeable clinical symptoms [11]. The American Thyroid Association reports that the prevalence of thyroid disease (TD) in the United States of America (USA) is estimated to be around 20 million individuals. Additionally, it is projected that at least 12% of the population will

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encounter a thyroid issue at some stage in their lives [12] .

The frequency of thyroid dysfunction in Saudi Arabia is 43.6% [13]. In Iraq, the prevalence of overt hypothyroidism was 3.2%, with 22.4% of males and 77.6% of females affected, The prevalence of overt hyperthyroidism is 3%, with 27.8% occurring in males and 72.2% occurring in females [14]. Inadequate management of disease can lead to various consequences, which can significantly impact cardiovascular and metabolic health[15]. Participating in physical exercise can enhance thyroid functionality, Participating in physical exercise may provide challenges while experiencing exhaustion, yet it is crucial for effectively managing hypothyroidism[16].

## 2. Materials and Methods

The thyroid gland is a crucial part of the human endocrine system [1]. Thyroxin (T4) and triiodothyronine (T3), the main hormones synthesized by the thyroid gland, have influence on several physiological processes in the body, such as digestion, body temperature regulation, and essential indicators like respiration and heart rate[2]. Thyroid dysfunction, which includes both hyperthyroidism and hypothyroidism, can occur due to an imbalance in the control of hormones produced by the thyroid gland [3]. Hyperthyroidism occurs by excessive production of thyroid hormone by the thyroid gland, beyond the body's needs [4] Hyperthyroidism is mainly caused by Graves' disease or toxic nodular goiter [5]. Hypothyroidism refers to the thyroid gland's failure to produce sufficient thyroid hormone to meet the body's metabolic needs [6]. Its causes include autoimmune such as Hashimoto's thyroiditis [7], dietary iodine deficit ,past thyroid surgery or irradiation, use of medicines such as lithium, and pituitary and hypothalamic problems [8] Infertility may be an outcome of hypothyroidism or hyperthyroidism. [9]

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The frequency of thyroid dysfunction in Saudi Arabia is 43.6% [13]. In Iraq, the prevalence of overt hypothyroidism was 3.2%, with 22.4% of males and 77.6% of females affected, The prevalence of overt hyperthyroidism is 3%, with 27.8% occurring in males and 72.2% occurring in females [14]. Inadequate management of disease can lead to various consequences, which can significantly impact cardiovascular and metabolic health[15]. Participating in physical exercise can enhance thyroid functionality, Participating in physical exercise may provide challenges while experiencing exhaustion, yet it is crucial for effectively managing hypothyroidism[16].

## 3. Results

Table (1) represents the distribution of participants with thyroid dysfunction according to socio-demographic characteristics. The present results found that most of the participants are aged 30-39 (22.7%) and 40-49 (29.9%), with a (mean± SD ) of 44.3±12.4 years. Females dominate the sample at 92.8%. the highest percentage of participants (72.7%) live in urban regions, while the lowest percentage of them (27.3%) live in rural regions. Many can read and write (35.9%), followed by secondary schooling (31.9%). Regarding occupation, 74.4% of the participants were unemployed, whereas 25.6% of them were employed. Most participants (90.2%) are married, while 9.8% are

single. Also, this study reveals that there is no significant association between hypothyroidism and hyperthyroidism patients according to socio-demographic.

**Table 1. The distribution of participants with thyroid disorders according to socio-demographic characteristics.**

Socio-Demographic characteristic		Total (n=348)		Hypothyroidism (n=270)		Hyperthyroidism (n=78)		P value
		No	%	No	%	No	%	
Age (years)	<20years	5	1.4	4	1.5	1	1.3	0.818
	20---29	37	10.6	29	10.7	8	10.3	
	30---39	79	22.7	58	21.5	21	26.9	
	40---49	104	29.9	80	29.6	24	30.8	
	50---59	73	21.0	56	20.7	17	21.8	
	60---69	42	12.1	36	13.3	6	7.7	
	70years	8	2.3	7	2.6	1	1.3	
	Mean±SD (Range)	44.3±12.4 (18-76)		44.6±12.6 (18-76)		43.1±11.8 (18-70)		0.356
Sex	Male	25	7.2	16	5.9	9	11.5	0.091
	Female	323	92.8	254	94.1	69	88.5	
Residence	Urban	253	72.7	204	75.6	49	62.8	0.055
	Rural	95	27.3	66	24.4	29	37.2	
Education	Illiterate	28	8.0	21	7.8	7	9.0	0.454
	Read & Write	125	35.9	94	34.8	31	39.7	
	Primary	53	15.2	45	16.7	8	10.3	
	Intermediate	29	8.3	20	7.4	9	11.5	
	Secondary	111	31.9	89	33.0	22	28.2	
	College & higher	2	0.6	1	0.4	1	1.3	
Occupation	Employed	89	25.6	65	24.1	24	30.8	0.233
	Unemployed	259	74.4	205	75.9	54	69.2	
Marital status	Married	314	90.2	242	89.6	72	92.3	0.483
	Unmarried	34	9.8	28	10.4	6	7.7	
*Significant difference between percentages using Pearson Chi-square test ( $\chi^2$ -test) at 0.05 level.								
#Significant difference between two independent means using Students-t-test at 0.05 level.								

In table (2), The results demonstrated that the ages of the individuals who participated since the onset of the disease was highest in the age group of 40-49 years, where the percentage reached 27.6%, followed by the age group of 30-40 years, with an estimated percentage. By 25.9%, while the lowest percentage was 3.4% for the age group less than 20 years. These results also indicate that the average age of participants at disease onset was 39.6 years. These results show that aging increases the risk of thyroid disease. Regarding the duration of the disease, the results revealed that the highest percentage (41.7%) of participants developed a thyroid disorder over 1-4 years, followed by 25.9% for less than a year, and 15.8% of participants. Within 5-9 years. The lowest percentage was during the period 10-14 years and over 15 years, where the percentage of each of them reached 8.3%. In addition, the average duration of disease was 4.6 years. In addition, these results indicate a highly statistically significant relationship between hyperthyroidism and hypothyroidism patients according to disease duration (P value < 0.001). This indicates that the duration of the disease is significantly higher in patients with hyperthyroidism disorder compared to patients with hypothyroidism disorder.

**Table 2. The distribution of participants with thyroid disorders according to epidemiological characteristics .**

epidemiological characteristic		Total (n=348)		Hypothyroidism (n=270)		Hyperthyroidism (n=78)		P value
		No	%	No	%	No	%	
Age at onset	<20years	12	3.4	11	4.1	1	1.3	0.521
	20---29	69	19.8	58	21.5	11	14.1	
	30---39	90	25.9	68	25.2	22	28.2	
	40---49	96	27.6	73	27.0	23	29.5	
	50---59	61	17.5	46	17.0	15	19.2	
	≥60years	20	5.7	14	5.2	6	7.7	
	Mean± SD (Range)	39.6±12.0 (18-69)		39.0±12.1 (18-69)		41.6±11.6 (18-68)		0.092
Duration of disease (years)	<1year	90	25.9	56	20.7	34	43.6	0.0001*
	1---4	145	41.7	107	39.6	38	48.7	
	5---9	55	15.8	52	19.3	3	3.8	
	10---14	29	8.3	27	10.0	2	2.6	
	=>15years	29	8.3	28	10.4	1	1.3	
		Mean±SD (Range)	4.6±5.8 (1w-30y)		5.4±6.2 (1w-30y)		1.7±2.8 (1w-20y)	
*Significant difference between percentages using Pearson Chi-square test ( $\chi^2$ -test) at 0.05 level.								
#Significant difference between two independent means using Students-t-test at 0.05 level.								

Table (3) shows The study's findings indicate that a significant proportion of individuals with hyperthyroidism exhibit symptoms such as nervousness (91.0%), hyperkinesia (48.6%), palpitations (70.5%), heat intolerance (67.9%), a greater appetite (57.7%), weight loss (51.3%), diarrhea (34.6%), and tremors (28.2%).

Table 3. Signs and Symptoms of studied sample with hyperthyroidism

Signs & Symptoms for the diagnosis of hyperthyroidism	Hyperthyroidism (n=78)	
	No	%
1-Nervousness	71	91.0
2-Increase appetite	45	57.7
3-Heat intolerance	60	67.9
4-Palpitation	55	70,5
5-Weight decrease	40	51,3
6-Diarrhea	27	34.6
7-Hyperkinesis	66	84.6
8-Tremers	22	28.2

Table (4) The findings of this study suggest that the majority of patients with hypothyroidism commonly encounter fatigue (87.0%), followed by fragile hair (71.9%), sluggish movements (68.1%), weight gain (64.1%), dry skin (61.1%), and intolerance to cold (60.0%), as showed in Table 4.

Table 4. signs and symptoms of studied sample with hypothyroidism.

Signs & Symptoms for the diagnosis of hypothyroidism	Hypothyroidism (n=270)	
	No	%
1-Tiredness	235	87.0
2-Weight increase	173	64.1
3-Constipation	133	49.3
4-Dry skin	165	61.1
5-Slow movements	184	68.1
6-Cold intolerance	162	60.0
7-Brittle hair	194	71.9

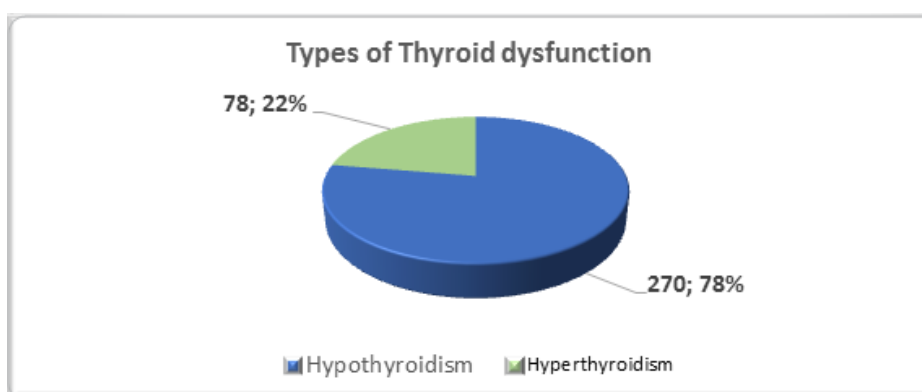


Figure 1. Illustrate the distribution of participants according to type of thyroid dysfunction

In figure 4.1, the current study found that the highest percentage (78.0%) of the participants with hypothyroidism, while the lowest percentage (22.0%) of patients with hyperthyroidism.

#### 4. Discussion

The current investigation revealed a higher prevalence of hypothyroidism compared to hyperthyroidism among 348 patients with thyroid dysfunction, a result consistent with prior research conducted in Baquba [17]. The data analysis of the present study reveals mean of age were (44.3±12.4SD) .agree with study conducted in Egypt [18].The present study demonstrates that the age group with the highest prevalence of hypothyroidism and hyperthyroidism is between 40 and 49 years old. This conclusion aligns with a previous study that also identified a larger percentage of cases in the same age group [19]. This study found that the prevalence of hypothyroidism and hyperthyroidism was higher in females compared to males [20]. This study corroborates the findings of a report conducted in Saudi Arabia [21], A study conducted in Iraq revealed a higher prevalence of hypothyroidism in females compared to males [22].Hormones Estrogen may exert a distinct pathogenic influence on the thyroid gland, rendering women more prone to developing thyroid illness [23].Regarding residential location, there is a higher prevalence of patients with both types of thyroid dysfunction in urban areas compared to rural areas. This discovery is analogous to a research conducted in Iraq by[24].

The majority of patients were found to be read-and-write, according to the current study's findings regarding education level. This finding contradicts the findings of an Ethiopian study that found that most individuals with thyroid illness were illiterate[25].The study's findings indicate a higher rate of thyroid dysfunction among the unemployed compared to the employed, which is consistent with a similar study conducted in Iraq [26]. According to marital status, this study discovered that individuals with hypothyroidism and hyperthyroidism had a higher probability of being married compared to being single, This conclusion is analogous to a study conducted in Iraq [28]. The findings of this study demonstrate a strong and statistically significant correlation between patients with hyperthyroidism and hypothyroidism, based on the duration of the disease (P value < 0.001). The findings of the present study are consistent with the study conducted in Denmark[29] and in Tehran [30], but diverge from the study conducted in Sudan[31]. The current investigation revealed that a significant proportion of the patients had been diagnosed with thyroid disease for a duration ranging from 1 to 4 years. This finding agree with study done in India [32]. A study reveals hypothyroidism is a chronic, lifelong condition requiring levothyroxine treatment, , The transition from Hashimoto's disease to Graves' disease is deemed uncommon, although there has been a growing recognition of the potential transformation from hypothyroidism to hyperthyroidism, even several years after the initial diagnosis of hypothyroidism[33].

The distribution, signs, and symptoms of hyperthyroidism among 78 patients are as follows: Anxiety: 91.0%. Heat intolerance: 76.9%. The prevalence of palpitation is 70.5%. Appetite has experienced a 57.7% increase. Weight reduction: 51.3%. The prevalence of diarrhea is 34.6%. The prevalence of hyper kinesis is 48.6%. The occurrence of tremors is 28.2%. A study conducted in the northern region of Iraq[34] revealed that the predominant weight loss percentage was 55.6%, palpitation occurred in 39.2% of cases, increased appetite was reported by 30% of participants, heat intolerance was experienced by 22.8%, nervousness was observed in 18% of individuals, and diarrhea was reported by 5.2%. The tremor had a magnitude of 68.88%. A study conducted in Nepal by [35]found that 70.1% of the participants experienced heat intolerance and 27.2% reported diarrhea. These findings agree with the results of the current study. A study conducted by [36]demonstrated that the prevalence of nervousness was 99%, heat intolerance was 89%, and diarrhea was 23%, which closely aligns with the findings of the present study. [37]. The study conducted by included a sample size of 260 patients. The results of the study indicated that there was a 45% rise in increase appetite and a 53% weight loss, as shown in agreement with the current study. The distribution of signs and symptoms of hypothyroidism among 270 patients reveals that the most prevalent symptoms are tiredness, affecting 87.0% of the patients, and hair loss, affecting 71.9%. The prevalence of slow movement is 68.1%, weight increase is 64.1%, dry skin is 61.1%,



cold intolerance is 60.0%, and constipation is 49.3%. A study conducted by [38] revealed that the predominant symptoms reported were weakness (92%), dryness of the skin (76%), weight increase (64%), and constipation (48%). This discovery is closely associated with the findings of the current study. Furthermore, a study conducted by [39] revealed that tiredness is the most prevalent symptom. The study conducted by [40] identified the most prevalent symptoms as dry skin (73.33%), hair loss (73.33%), and constipation (43.33%). These proportions are closely associated with the current research. Among a total of 50 cases of primary hypothyroidism, weight increase was the predominant symptom, observed in 36% of patients. Lethargy and fatigue were the subsequent most common symptoms, reported by 32% of patients [41]. A study conducted by [42] found that tiredness is the most common symptom, and the percentage of slow movement was 33.10%.

## 5. Conclusion

Most cases were hypothyroidism 78% while hyperthyroidism represent only 22%, the most common presenting symptom tiredness 87% and nervousness 91% respectively.

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