

## Survey of Awareness of Thyroid Disorders among the Riyadh Population, Central Region of Saudi Arabia

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### ABSTRACT

**Background:** Thyroid diseases are among the commonest endocrine disorders worldwide and attention to physical examination findings, combined with selected laboratory and radiologic tools and aids in the early diagnosis and treatment of thyroid endocrine disorders is fundamental. Health education is considered an essential component to improve knowledge and change behavior. People affected by thyroid diseases often have inadequate knowledge about the nature of thyroid diseases, its risk factors and associated complication.

**Objectives:** The aim of this study was to assess the awareness of the Riyadh population with various aspects of thyroid diseases. **Methods:** A cross-sectional study was carried out during the period from 1 December 2017 to 28 February 2018 in Riyadh city. A random, representative sample from Saudi nationals were included. Those who are under 18 years old were excluded. Systematic random sampling technique was followed. An online well constructed questionnaire translated into Arabic was disseminated and self administered by each participant. Data were analyzed by SPSS version 16, using descriptive statistics. **Results:** The total number of participants was 870 among which 297 (34.1%) were males and 573 (65.9%) were females. The participants were classified into 4 age groups, most of them were in the 31-50 years old group, counting 492 (56.5%). Only 6.6% among the participants did not know what the thyroid gland is, while 93.4% have chosen specific answers that are facts regarding the thyroid on different levels of knowledge. Among participants, 17% related thyroid disorders to disturbances in the menstrual cycle, recurrent miscarriage, and birth of dead fetuses, while 30.3% related that to psychological factors as depression, confusion, lack of concentration, mood swings, and anxiety, 27.4% to neck and joint pain with fatigue and weight loss, and 25.3% constipation and/or diarrhea, voice changes and swelling of the neck. Among our participants, 16.8% reported suffering from hypothyroidism. Regarding hypothyroidism, 30.9% answered yes to the question regarding whether or not ionized salt has a role in the treatment of hypothyroidism, when 22.2% responded with 'No' and the majority (46.9%) responded 'I do not know'. The majority (39.0%) answered 'Yes' to whether the treatment can be stopped when investigations become normal in hypothyroidism, and (43.6%) answered 'I do not know,' in hyperthyroidism. Moreover, 26.6% thought that herbal remedy can cure hypothyroidism as well as (26.0%) in hyperthyroidism. **Conclusion:** This study recommended that health policy makers must conduct more effective health education sessions to increase knowledge of the population and their caregivers about various aspects of thyroid diseases and the importance of compliance with its treatment.

**Keywords:** Awareness, thyroid diseases, Knowledge, Riyadh City, Saudi Arabia

### INTRODUCTION

Thyroid gland is an endocrine organ located in the anterior aspect of the neck in front of the trachea. The function of this gland is to produce sufficient amount of thyroid hormones which will primarily influence the metabolic rate and protein synthesis. Thyroid hormones also have other effects such as development of tissues and organs. The production of thyroid hormone is regulated by hypothalamic pituitary axis through thyroid stimulating hormone from anterior pituitary gland and thyroid releasing hormone from the hypothalamus.

Prevalence of thyroid disorders is a very common medical condition. Symptoms of thyroid disorders depending on the condition of thyroid gland functions [1]. The function of the thyroid can be primarily affected from the gland itself (most common) or secondarily affected from higher centers signal in the brain (hypothalamic pituitary axis). This effect on the gland function will result in one of two

types of disorders hypothyroidism or hyperthyroidism. Hypothyroidism is the most prevalent type affecting 4-5% in the developed countries. While it's is more common in areas with iodine deficiency [2].

The pattern of the disorders distribution depends on age, ethnicity and geographic factors especially in iodine deficient areas. Despite being one the most prevalent medical condition, thyroid disorders are the most underdiagnosed and neglected chronic health conditions globally [3,4].

During clinical assessment of thyroid disorders patient may present with variety of manifestations involving major systems of the body like endocrine, cardiovascular, central nervous system, musculoskeletal, hematological, reproductive, gastrointestinal and dermatological [5]. These manifestations can be confused with other medical conditions because; they are not specific to thyroid disorders only.

Thyroid function test panel is commonly used for screening and evaluating thyroid disorders. The American Thyroid Association recommends that adults must be screened for thyroid disorders by measurement of the serum thyrotropin concentration at the age 35 years and every 5 years thereafter [6].

Physiological thyroid gland function is critical for neurocognitive development, growth and development throughout childhood and adolescence, and maintenance of normal physiological functions in adults [7].

Hypothyroidism is case of deficient production of thyroid hormone by the thyroid gland. It is of two types; primary (abnormality in thyroid gland itself) or secondary/central (hypothalamic or pituitary disease) [8].

Among hypothyroidism cases, primary hypothyroidism is the etiology is about 99% of the cases. The term subclinical hypothyroidism is used to define that grade of primary hypothyroidism, in which there is an elevated thyroid-stimulating hormone (TSH) concentration in the presence of normal serum free thyroxin (T4) and triiodothyronine concentrations [9]. Hyperthyroidism is the case of excessive production of thyroid hormone by the thyroid gland. Thyrotoxicosis is the case of excessive thyroid hormone levels due to any cause and thus, it includes hyperthyroidism [10].

## STUDY OBJECTIVE

Evaluating the knowledge of the Riyadh population about thyroid gland and its disorders, their causes, diagnostic methods available, prevention strategies and treatment options available. Detecting the awareness of the population about the possible complications and the impact of the disorders on their life.

## Material and Methods

A cross-sectional study was carried out during the period from 1 December 2017 to 28 February 2018 in Riyadh city. A random, representative sample from Saudi nationals were included. Those who are under 18 years old were excluded. The sample size was calculated using the sample size equation:  $n = z^2 p(1-p)/e^2$ , considering target population more than 1000, and study power 95%. Systematic random sampling technique was followed. An online well constructed questionnaire translated into Arabic was disseminated and self administered by each participant. It covers the following items: age, sex, knowledge of what thyroid gland and what is its diseases, causes, complications,

management and prevention measures of kidney diseases, whether the participant has/had thyroid disease, duration of illness, diagnosis, concurrent morbidities and type of treatment.

A total of 870 samples were collected; the primary focus of Symptoms of thyroid troubles knowledge about Hypothyroidism and hyperthyroidism. Filled questionnaires were reviewed for completeness and accuracy before data entry, then the data were coded and analyzed by SPSS version 16 (SPSS Inc., Chicago, Illinois, USA) using Chi-square test. Participants were informed that participation was completely voluntary, a written consent was obtained from each participant before research, no name was recorded on the questionnaires and all of the personal information of participants was kept confidential.

## RESULTS

The total number of participants was 870 among which 297 (34.1%) were males and 573 (65.9%) were females. The participants were classified into 4 age groups, most of them were in the 31-50 years old group, counting 492 (56.5%). Only 6.6% among the participants did not know what the thyroid gland is, while 93.4% have chosen specific answers that are facts regarding the thyroid on different levels of knowledge. Among participants, 17% related thyroid disorders to disturbances in the menstrual cycle, recurrent miscarriage, and birth of dead fetuses, while 30.3% related that to psychological factors as depression, confusion, lack of concentration, mood swings, and anxiety, 27.4% to neck and joint pain with fatigue and weight loss, and 25.3% constipation and/or diarrhea, voice changes and swelling of the neck. Among our participants, 16.8% reported suffering from hypothyroidism. Regarding hypothyroidism, 30.9% answered yes to the question regarding whether or not ionized salt has a role in the treatment of hypothyroidism, when 22.2% responded with 'No' and the majority (46.9%) responded 'I do not know'. The majority (39.0%) answered 'Yes' to whether the treatment can be stopped when investigations become normal in hypothyroidism, and (43.6%) answered 'I do not know,' in hyperthyroidism. Moreover, 26.6% thought that herbal remedy can cure hypothyroidism as well as (26.0%) in hyperthyroidism. Additionally, 74.6% think that cabbage, cauliflower and soy products should be avoided in case of hypothyroidism.

**Table (1):** Sex, age and knowledge about thyroid gland and thyroid troubles among Riyadh population, (2017- 2018).

	Frequency	Percent
<b>Sex</b>		
Female	573	65.9
Male	297	34.1
<b>Age group</b>		
18-30	279	32.0
31-50	492	56.5
>50	100	11.5
<b>What is the thyroid gland</b>		
I don't know	57	6.6
gland lies in the front of the neck	323	37.1
Important gland for metabolism and all body functions	221	24.4
Important endocrine gland	85	9.8
Important endocrine gland lies in front of the trachea	150	17.2
<b>Function of the thyroid gland</b>		
Regulation of body temperature, blood pressure, growth and metabolism	237	27.2
Regulation of growth	102	11.7
Regulation of body temperature	171	19.6
Regulation of body temperature and blood pressure	139	15.9
Regulation of using of body energy	165	19.0
I don't know	56	7.2
<b>Symptoms of thyroid troubles</b>		
Neck pain, joint pain, joint weakness, excessive weight loss, fatigue and palpitations	238	27.4
Swelling of the neck, voice changes, constipation and/or diarrhea for long periods	220	25.3
Depression, confusion, lack of concentration, mood swings, anxiety	264	30.3
Disturbance in women's menstrual cycle, recurrent miscarriage, birth of dead fetus	148	17.0

**Table (2):** Knowledge about Hypothyroidism among Riyadh population, (2017- 2018).

Knowledge	Yes	No	I don't know
	No. (%)	No. (%)	No. (%)
Is iodized salt have a role in treatment of Hypothyroidism	269(30.9)	193(22.2)	408(46.9)
Herbal remedy can cure thyroid disorders	231(26.6)	244(28.0)	395(45.4)
Can you stop treatment of hypothyroidism when the investigations were normal	339(39.0)	256(29.4)	275(31.6)
Can you stop treatment of hypothyroidism in pregnancy because it harms the fetus	435(50.0)	267(30.7)	168(19.3)
Can women with thyroid insufficiency conceive normally	314(36.1)	126(14.5)	430(49.4)
Are cabbage, cauliflower and soy products should be avoided in case of hypothyroidism	649(74.6)	93(10.7)	128(14.7)
Is Hypothyroidism a genetic disease	357(41.0)	323(37.1)	19.(218)
Is Hypothyroidism infectious disease	152(17.5)	694(79.8)	24(2.8)
Is radioactive iodine one of the therapeutic options	507(58.3)	90(10.3)	273(31.4)

**Table (3):** Knowledge about hyperthyroidism among Riyadh population(2017- 2018).

Knowledge	Yes	No	I don't know
	No. (%)	No. (%)	No. (%)
Herbal remedy can cure thyroid disorders	226(26.0)	212(24.4)	432(49.7)
Can you stop treatment of hyperthyroidism when the investigations were normal	251(28.9)	240(27.6)	379(43.6)
Can you stop treatment of hyperthyroidism in pregnancy because it harms the fetus	172(19.8)	242(27.8)	456(52.4)
Can women with hyperthyroidism conceive normally	387(44.5)	107(12.3)	376(43.2)
Are cabbage, cauliflower and soy products should be avoided in case of hyperthyroidism	106(12.2)	104(12.0)	660(75.9)
Is hyperthyroidism a genetic disease	168(19.3)	359(41.3)	343(39.4)
Is hyperthyroidism infectious disease	31(3.6)	636(73.1)	203(23.3)
Is radioactive iodine one of the therapeutic options of hyperthyroidism	273(31.4)	90(10.3)	507(58.3)
Does daily diet affect thyroid function?	506(58.2)	108(12.4)	256(29.4)

**Table (4):** Thyroid troubles, treatment, investigations and family history of thyroid troubles among Riyadh population,(2017- 2018) .

	Frequency	Percent
<b>Having thyroid troubles</b>		
No	554	63.7
Hypothyroidism	146	16.8
Hyperthyroidism	17	2.0
Don't know	153	17.6
<b>Using of medications for thyroid troubles</b>		
Yes	142	16.3
No	728	83.7
<b>Have you ever done thyroid gland investigations</b>		
Yes	410	47.1
No	460	52.9
<b>Causes of doing investigations</b>		
Friends or relatives' suggestions	32	3.7
Doctor's suggestions	175	20.1
I read about it in newspapers or the Internet	43	4.9
My observation for the emergence of symptoms	160	18.4
Other	145	16.7
<b>Causes of not doing thyroid investigations</b>		
Have no idea	297	34.1
Have no money	143	16.4
Fear of investigations	138	15.9
No need	108	12.4
Not available at government clinics	96	11.0
Lack of time	87	10.0
<b>Family history of thyroid troubles</b>		
Yes	291	33.4
No	453	52.1
Don't know	126	14.5

## DISCUSSION

Thyroid diseases are among the commonest endocrine disorders worldwide and attention to physical examination findings, combined with selected laboratory and radiologic tools, aids in the early diagnosis and treatment of thyroid endocrine disorders is fundamental<sup>[8]</sup>.

This community-based study was conducted on the general population of Riyadh city, of both sexes, to evaluate the knowledge, awareness, and practice on thyroid disorders in a representative sample. Saudi Arabia is a rapidly developing country with changes that influence lifestyle of the population towards urbanization with more progression towards general health knowledge and practice.

The results and outcomes of this study present unique information on trends in Riyadh population, their socio-demographic characteristics, and their knowledge on thyroid gland, mainly, hypothyroidism, and hyperthyroidism.

KAP of an individual can influence their behavior and management about diseases and health care. In the present study, the total number of participants was 870 among which 297 (34.1%) were males and 573 (65.9%) were females. The participants were classified into 4 age groups, most of them were in the 31-50 years old group, counting 492 (56.5%). Only 6.6% among the participants did not know what the thyroid gland is, while 93.4% have chosen specific answers that are facts regarding the thyroid on different levels of knowledge. Among participants, 17% related thyroid disorders to disturbances in the menstrual cycle, recurrent miscarriage, and birth of dead fetuses, while 30.3% related that to psychological factors as depression, confusion, lack of concentration, mood swings, and anxiety, 27.4% to neck and joint pain with fatigue and weight loss, and 25.3% constipation and/or diarrhea, voice changes and swelling of the neck.

Not only general population can have poor knowledge on thyroid disorders, also physicians as in *Askari et al.*<sup>[11]</sup> study which was conducted on general practitioners in Iran which showed that the mean knowledge score of GPs was 39.9% and on average, the correct responses rate to questions concerning the definition, pathophysiology, diagnosis, complications, and treatment of thyroid disorders were 39.0%, 39.3%, 48.8%, 34.3%, and 44.6%, respectively. Among our participants, 16.8% reported suffering from hypothyroidism. This prevalence is found to be less than the findings of another study conducted in Saudi Arabia by *Gaffer Ali et al.*<sup>[12]</sup> in which the population was the males and females attending Ashifa Medical Complex in Albahah city showing that prevalence of thyroid dysfunction in overall males and females was 43.6%, 40.8% where the cases were hypothyroidisms. It was also found that 2% among the participants suffered from hyperthyroidism. This conclusion is, however, in accordance with the findings of *Gaffer Ali et al.*<sup>[12]</sup> who recorded a total prevalence of 2.8% suffering from hyperthyroidism in the studied group. Supporting these findings are the systematic review of *Al Shahrani et al.*<sup>[13]</sup> which was run to determine the epidemiology of thyroid diseases in the Arab countries and showed that the prevalence of different types of thyroid disease varied between different studies ranging from 6.18 to 47.34%. Prevalence of goiter was reported by several researchers in Arab world, such as Egypt, Algeria and Bahrain with 25.25, 86 and 1.7%, respectively.

Regarding hypothyroidism, 30.9% answered yes to the question regarding whether or not ionized salt has a role in the treatment of hypothyroidism, when 22.2% responded with 'No' and the majority (46.9%) responded 'I do not know'. In Rai et al,<sup>[14]</sup> study, which was carried out on women of Cosmopolitan city, Central India, only 49.20% females knew about hyperthyroidism and hypothyroidism. The majority answered 'Yes' to whether the treatment can be stopped when investigations become normal in hypothyroidism, and 'I do not know,' in hyperthyroidism. Moreover, 26.6% thought that herbal remedy can cure thyroid disorders, while *Rai et al.*<sup>[14]</sup> found that 55.2% of females thought that thyroid disorders could be cured by using alternative medicine<sup>[14]</sup>. Regarding the patients that already suffer a thyroid disorder, *Jørgensen et al.*<sup>[15]</sup> found that persons aware of their hypothyroidism, diabetes mellitus or hypertension

reported poorer self rated health than individuals without such conditions.

Additionally, 74.6% thought that cabbage, cauliflower and soy products have to be avoided in case of hypothyroidism, while in the study of *Sethi et al.*<sup>[16]</sup>, done on hypothyroidism patient, 54.6% did not avoid eating cabbage, cauliflower, and soya. The knowledge about excessive weight gain and obesity with hypothyroidism was similar among patients in various studies. *Singh et al.*<sup>[17]</sup> mentioned that 79.5% of patients attributed weight gain to hypothyroidism while 81.6% of patients in this study agreed that hypothyroidism causes weight gain. A low level of knowledge among participants was associated with lower concern, and lesser precautions taken for thyroid disorders. Thus, these participants need to receive more inputs from the health-care system and physicians.

## CONCLUSION AND RECOMMENDATIONS

This study recommended that health policy makers must arrange more effective health education sessions to increase knowledge of the population and their caregivers about the various aspects of thyroid diseases and the importance of compliance with its treatment.

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