

ORIGINAL ARTICLE

Assessment of knowledge and awareness regarding thyroid disorders among Saudi people

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ABSTRACT

Background: Thyroid disorders are amongst the most prevalent of the medical condition. According to the World health organization (WHO), more than 190 million suffer from iodine deficiency disorders. This study aimed to assess the knowledge of the thyroid dysfunction and degree of awareness regarding thyroid diseases among Saudi Arabian population.

Methodology: An online survey was conducted among 367 adult residents in Saudi Arabia. An Arabic self-administered questionnaire was filled by the participants including socio-demographic data other questions to assess knowledge about the type and functions of the thyroid gland, its disorders, factors affecting thyroid disorders, and their common manifestations.

Results: Among the total 367 participants who responded to the online questionnaire, 30.8% were aged between 20 to 35 years, 76.3% were females and 22.3% were males. Statistical analysis showed that 140 (57.32%) of respondents had good knowledge, whereas 188 of them (42.68%) had poor knowledge of thyroid disorder diseases. Age, Sex, education, and occupation had no significant effect on the knowledge level of the respondents ($p > 0.05$).

Conclusion: Knowledge of thyroid disorders was not found good enough among Saudi Arabian population. The present study warrants the educational program and awareness campaigns on thyroid disorders for the general population.

Keywords: Thyroid disorders, awareness, knowledge, hypothyroidism, hyperthyroidism.

Introduction

Thyroid disorders are amongst the most prevalent medical conditions [1]. According to the World Health Organization (WHO), more than 190 million suffer from iodine deficiency disorders [2]. The prevalence of hypothyroidism, the most common type of thyroid dysfunction, in the developed world is 4%–5% [3]. Although thyroid dysfunction usually develops in more than 12% of the US population during their lifetime, true thyroid emergencies are rare [4]. The thyroid disorders could be due to congenital factors, a genetic predisposition, inadequate levels of dietary iodine intake, pregnancy, radiotherapy, viral infections, surgery, underlying diseases, such as infiltrative disorders, or even autoimmunity [5,6]. Thyroid dysfunction is also reported to be caused by many secondary factors, including different kinds of stressors [7,8]. Abnormal thyroid

hormone levels may lead to hypo- or hyperthyroid states. Hypothyroidism is defined as a condition that results due to sub-optimal circulating levels of one or both thyroid hormones [9] or insufficient stimulation by thyrotropin (TSH) of an otherwise normal thyroid gland [10]. However, it could be readily diagnosed by laboratory testing of serum thyroid-stimulating hormone (TSH)

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and free T4. The causative factors include autoimmune thyroiditis, dietary iodine deficiency, previous thyroid surgery or irradiation, intake of drugs, such as lithium, and pituitary, and hypothalamic disorders [11]. Patients with treated hyperthyroidism, a history of neck irradiation, postpartum thyroiditis, and certain autoimmune disorders, especially type 1 diabetes, are at increased risk for subclinical hypothyroidism. Sub-clinical hypothyroidism is also observed in patients who are being treated with the iodine-containing antiarrhythmic agent amiodarone, lithium, or immune response modulators, such as interferon alfa [12].

Hyperthyroidism affects about 2% of women and 0.2% of men [13]. The key symptoms for suspected cases of hyperthyroidism include weight and height, pulse rate and regularity, blood pressure, cardiac examination, thyroid enlargement, proximal muscle weakness, tremor, an eye examination (for evidence of ophthalmopathy), and a skin examination [14]. Serum TSH has the highest sensitivity and specificity in the diagnosis of thyroid disorders, but serum-free Thyroxine 4 or Thyroxine 3 are also used to distinguish between subclinical and overt hyperthyroidism [11]. The most common cause for hyperthyroidism causes include Graves' disease, toxic multinodular goiter, and toxic adenoma. Any dysfunction of the thyroid has a profound impact on health and well-being. Thyroid disorders are believed to be a common health issue in Saudi Arabia, as it is worldwide. Thyroid dysfunctions are the most common endocrine disorders and continue to be common yet one of the most underdiagnosed and neglected chronic health conditions worldwide. The present study was aimed at determining the degree of knowledge of thyroid disorders among the Saudi population to develop awareness measures for tackling the problem.

Subjects and Methods

An online survey was conducted among 367 adult residents in Saudi Arabia. An Arabic self-administered questionnaire was filled by the participants including socio-demographic data other questions to assess knowledge about the type and functions of the thyroid gland, its disorders, factors affecting thyroid disorders, and their common manifestations. Scores were assigned to the respondent's replies: 0 for no, I don't know or the wrong choice; and 1 for yes or correct choice. The total score for Knowledge was computed by summing the individual scores for questions 5 to 20. Statistical Package for Social Sciences software version 22.0 was used for data entry and analysis. Descriptive statistics were presented as number and percentage for categorical data and mean and standard deviation for continuous data. Chi-square test (χ^2) was used for the association between categorical variables. A *p*-value equal to or less than 0.05 was considered as statistically significant. Ethical approval was taken from the ethical committee. The participants had the right not to participate in the study or to withdraw from the study before completion.

Confidentiality and privacy were guaranteed for all the participants.

Results

In this study, a total of 367 participants responded to the online questionnaire. Majority of respondents were aged between 20 to 35 years and females subjects were higher compared to the male counterparts (76.3%). Furthermore, 76% of the subjects had a university degree and 51.6% of the subjects were unemployed (Table 1).

In regards to the questions concerned with the type and functions of the thyroid gland and the potential causes for its disorder. Respondents were more aware of the following: thyroid is an endocrine gland (77.9%), and thyroid dysfunction affects blood cholesterol level (62.4%). Poor knowledge was found as regards a confirmed relationship between smoking and thyroid disturbances where only (41.7%) of the subjects answered no which was the correct answer. Furthermore, (42.1%) of participants knew that thyroid dysfunction is not a genetic disease (Table 2).

The present study also assessed the respondents' knowledge about symptoms of hypo- and hyperthyroidism. As regards hyperthyroidism, the knowledge of the respondents was good as (81%) knew that insomnia and lack of sleep are symptoms of hyperthyroidism, and (79.7%) agreed that loss of weight despite a good appetite is a symptom of hyperthyroidism. In contrast, a lower percentage

Table 1. Socio-demographic feature of participants from different cities in the KSA.

	No	%
Age (years)*		
Respondents	365	99.5
<20	33	9
20–35	113	30.8
36–50	132	36
>50	87	23.7
Gender		
Respondents	362	98.6
Male	82	22.3
Female	280	76.3
Educational level		
Respondents	367	100
High school	70	19.1
Intermediate	13	3.5
Primary	5	1.4
University or higher	279	76
Occupation		
Respondents	362	98.6
Unemployed	187	50.9
Employed	175	47.7

Table 2. Knowledge about the thyroid gland, its functions, and causes of thyroid disease.

	No	%
The thyroid gland is an endocrine gland		
Respondents	363	99
Yes	283	77.9
Thyroid dysfunction affects brain development		
Respondents	360	98
Yes	157	43.6
Thyroid dysfunction affects the blood cholesterol level		
Respondents	362	98.6
Yes	226	62.4
Thyroid dysfunction results in cardiac diseases		
Respondents	359	97.8
Yes	212	59
Does sport affect thyroid dysfunction?		
Respondents	362	98.6
No	186	46.4
Is there a confirmed relationship between smoking and thyroid disturbances		
Respondents	364	99.2
No	152	41.7
Thyroid dysfunction is genetic?		
Respondents	361	98.4
No	152	42.1

(33.8%) of subjects did not agree that oligomenorrhea and amenorrhea are symptoms of hyperthyroidism. Manifestations of hypothyroidism were recognized by a lower percentage of respondents. Skin and hair dryness is not a symptom of hypothyroidism (correct answer) was answered by only 20.8% of the subjects. Feeling cold in hot weather is not a symptom of hypothyroidism (correct answer) was answered by (16.5%), 84.9% of the subjects agreed to the question “if fatigability and sleepiness are manifestations of hypothyroidism” (Table 3).

Respondents who had thyroid disorders represented 20.09%, the participants who did not have thyroid disorders represented 67.39 %, and 4.89% subjects remained unaware of the presence or absence of the disease (Figure 1).

The median knowledge score was found 9; the respondents were divided into two groups: those above or equal to 9 were refereed as subjects with good knowledge and those with less than 9 as subjects with poor knowledge. The analysis showed that 140 (57.32%) of respondents had good knowledge; 188(42.68%) had poor knowledge (Figure 2).

When secondary factors were assessed for these study it showed no significant relationship to the knowledge of participants ($p > 0.05$). Age, gender, educational level, and work had a p -value (0.47, 0.06, 0.49, and 0.16, respectively, Table 4).

Discussion

Thyroid dysfunction is one of the leading endocrine disorders. It represents around 30% to 40% of the patients visiting the endocrinology clinic [15]. The American Association of Clinical Endocrinologists estimated that in the US approximately 13 million people, or 4.78% of the population, remains undiagnosed for thyroid dysfunction[16]. The documented prevalence rates of thyroid CA in the African continent are as follows (papillary: 6.7%–72.1%, follicular: 4.9%–68%, anaplastic: 5%–21.4%, and medullary: 2.6%–13.8%) [17]. Thyroid cancer has become the second most common cancer among young Saudi women with a male to female ratio at 0.3:1 [18]. A study conducted at a cosmopolitan city of central India among women to asses knowledge and awareness regarding thyroid disorders concluded that females have inadequate knowledge of thyroid gland, and associated disorders and they had myths and misconception regarding thyroid disorders [1]. In Turkey, a similar study was conducted to determine the knowledge, attitudes, and behaviors of physicians towards thyroid disorders and iodine requirements in pregnancy. Physicians had insufficient and/or erroneous knowledge about thyroid disorders during pregnancy. Among them, 73.1% of endocrinologists, 32.7% of family physicians, and 17.8% of obstetricians knew the correct level of TSH during pregnancy ($p < 0.001$). Furthermore, 67.1% of physicians

Table 3. Knowledge of respondents about symptoms of hyper- and hypothyroidism.

	No	%
Hyperthyroidism		
Loss of weight despite good appetite is a symptom of hyperthyroidism		
Respondents	364	99.2
Yes	290	79.7
Insomnia and lack of sleep are symptoms of hyperthyroidism		
Respondents	363	98.9
Yes	294	81
Increased heart rate is a symptom of hyperthyroidism		
Respondents	363	98.9
Yes	265	73
Inability to stand hot weather and wearing light clothes in cold weather are symptoms of hyperthyroidism		
Respondents	363	98.9
Yes	266	73.3
Oligomenorrhea and amenorrhea are symptoms of hyperthyroidism		
Respondents	363	98.9
No	123	33.8
Hypothyroidism		
The sudden increase in weight is a symptom of hypothyroidism		
Respondents	364	99.2
No	41	11.3
Fatigability and sleepiness are manifestations of hypothyroidism		
Respondents	358	97.5
Yes	304	84.9
Skin and hair dryness are symptoms of hypothyroidism		
Respondents	361	98.4
No	75	20.8
Feeling cold in hot weather is a symptom of hypothyroidism		
Respondents	363	98.9
No	60	16.5

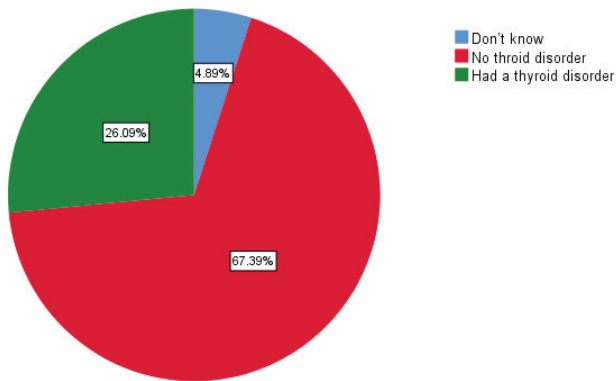


Figure 1. Respondents status as regards to the presence or absence of thyroid disorders.

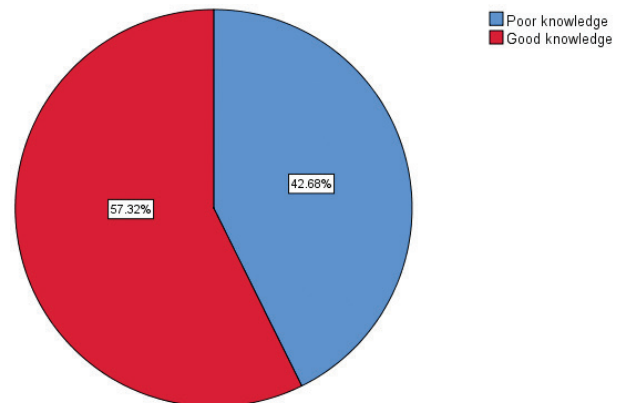


Figure 2. The knowledge of the respondents as regards to their thyroid disorders.

Table 4. Sociodemographic factors of the respondents with inadequate and adequate knowledge.

	Poor knowledge N (%)	Good knowledge N (%)	p-value
Age (years)			
Respondents	140 (100%)	186 (98.9%)	0.47
<20	11 (7.8%)	20 (10.6%)	
20–35	47 (33.6%)	56 (29.8%)	
36–50	55 (39.3%)	66 (35.1%)	
>50	27 (19.3%)	44 (23.4%)	
Gender			
Respondents	139 (99.2%)	185 (98.4%)	0.06
Male	23 (16.4%)	50 (26.6%)	
Female	116 (82.9%)	135 (71.8%)	
Educational level			
Respondents	140 (100%)	188 (100%)	0.49
High school	31 (22.1%)	34 (18.1%)	
Intermediate	6 (4.3%)	5 (2.6%)	
Primary	3 (2.1%)	2 (1.1%)	
University or higher	100 (71.5%)	147 (78.2%)	
Occupation			
Respondents	140 (100%)	184 (97.8%)	0.16
Unemployed	74 (52.9%)	89 (47.3%)	
Employed	66 (47.1%)	95 (50.5%)	

thought it is unnecessary to offer iodine supplementation to pregnant women. Endocrinologists achieved the highest scores in each section, and also had the highest total scores ($p < 0.001$). Family physicians achieved higher scores than obstetricians [19]. A Retrospective review was carried out on 189 surgically treated patients with thyroid disease at King Fahad hospital and Ohud Hospital Medinah Munawarah, Kingdom of Saudi Arabia (KSA). Female preponderance was seen found in the study with female to male ratio of 5.5:1. Malignancy was found in 19.5% of cases. Papillary carcinoma was the most common malignancy (91.8%) followed by follicular (5.4%) and medullary carcinoma (2.7%), male: female ratio for patients with thyroid malignancy was 1:2.7. The overall complication rate was 4.2%, the laryngeal nerve injury was low (1.5%). The pattern of thyroid diseases in Medinah Munawarah is generally similar to other regions of Saudi Arabia, with a few regional variations [21]. Thyroid hormone excess and deficiency are frequently misunderstood and are too often overlooked and misdiagnosed. At the regional level, thyroid cancer is the fifth most common cancer in the Gulf Cooperation Council countries. According to the 2008 Saudi Cancer Registry report, there were a total of 727 cases of thyroid cancers; 606 among Saudis and 121 among non-Saudis. Among Saudis, thyroid cancer accounted for 6.8% of all newly diagnosed cases that year [18]. For these reasons, the study aimed to assess public knowledge regarding the

differences between hyperthyroidism and hypothyroidism in Saudi Arabia. We found that 57.32% of respondents had good knowledge, while 42.68% had poor knowledge about the thyroid gland and its disorders. Good knowledge was observed in questions regarding the type of thyroid gland (endocrine; by 77.9% of respondents), and thyroid dysfunction affects blood cholesterol level (62.4%). According to a study conducted in Tabuk city, the knowledge percent was close to our results which were 52% of respondents having good knowledge, while 45% have poor knowledge about the thyroid gland and its disorders. Good knowledge was demonstrated in questions on the type of thyroid gland (endocrine; by 71.4% of respondents), and the most susceptible individuals to have disorders were women; by 90.4% of respondents [11]. Out of the 250 females, only 54.80% females knew that thyroid is normal gland in our body, other 18.80% considered thyroid as disease and remaining 26.40% did not have any idea about thyroid gland [1]. Only 49.20% females out of the 250 knew about hyperthyroidism and hypothyroidism. Other 6.40% considered it as cancer. And the remaining 44.40% answered it as they don't know [22]. Thyroid disorders, including issues about iodine nutrition, are global health problems and especially hypothyroidism and iodine deficiency are associated with serious maternal and fetal outcomes, when left untreated [19]. Other common causes of primary thyroid disease include autoimmune destruction (Hashimoto's

thyroiditis), radiation-induced thyroiditis, postsurgical hypothyroidism, antithyroid drugs, and infiltrative disease [23]. Good knowledge about hypothyroidism symptoms in our participants showed when asked if fatigability and sleepiness are manifestations of hypothyroidism and (84.9%) agreed. The symptoms and signs of central hypothyroidism, which include fatigue, depression, cold intolerance, hoarseness, dry skin, constipation, bradycardia, and hyporeflexia, are usually the same but are observed milder than those of primary hypothyroidism, with goiter being seldom present [24]. Hyperthyroidism manifestations' knowledge were higher in our participants as (81%) had the knowledge that Insomnia and lack of sleep are symptoms of hyperthyroidism, and (79.7%) agreed that Loss of weight despite good appetite is a symptom of hyperthyroidism. Untreated or partially treated thyrotoxicosis is associated with weight loss, osteoporosis, atrial fibrillation, embolic events, muscle weakness, tremor, neuropsychiatric symptoms, and rarely cardiovascular collapse and death [25]. The present study results revealed that respondents who had thyroid disorders represented (20.09%), the higher percentage for participants who hadn't thyroid disorders which is similar to Saudi study conducted in Tabuk where the respondents had thyroid disorders representing 20.8% [11]. Age, Sex, education, and occupation had no significant effect on the knowledge level of the respondents ($p > 0.05$).

Conclusion

Although more than half of respondents had good knowledge about thyroid disorders, further awareness and educational campaigns should be established to increase the knowledge of these diseases between Saudi people and faster detection of undiagnosed cases to prevent disorders and cancers.

List of Abbreviations

KSA	Kingdom of Saudi Arabia
TSH	Thyroid-stimulating hormone
WHO	World health organization
χ^2	Chi-square test

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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Consent for publication

Informed consent was obtained from all the participants.

Ethical approval

The study was done under the supervision of King Saud bin Abdulaziz University.

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