

Original Research Article

**ASSESSMENT OF KNOWLEDGE AND ATTITUDE REGARDING THYROID GLAND
AND THEIR DISORDERS AMONG POPULATION IN TAIF CITY, SAUDI ARABIA**

Abstract:

Background: Thyroid disorders are among the commonest endocrine disorders worldwide. Attention on people's knowledge and awareness about thyroid diseases is very important in helping for early diagnosis and early treatment of these disorders. The aim of this study to assess the degree of knowledge and attitude of thyroid gland and their disorders among general population in Taif City, KSA.

Methodology: A cross-sectional study was conducted on a representative sample of 600 Saudi adults of Taif general population. A pre-designed online questionnaire was used for data collection which consists of sociodemographic data, questions regarding knowledge and awareness of thyroid disorders. All data was entered and analyzed by using SPSS program version 22.

Results: A total of 600 participants responded to the online questionnaire. Majority of respondents were aged between 18 to 32 years and males' subjects were higher compared to the

male counterparts (50.8%). Mean knowledge score of participants was 36.12. Participants who scored higher were 46.3% and considered as good knowledge level. 53.7% had bad knowledge level as they scored lower than mean score knowledge.

Conclusion: Our study population show relatively good knowledge level compared to previous literature. Knowledge score was significantly associated with gender, educational level, working status and family income per month.

Keywords: Thyroid disorders, awareness, knowledge, Saudi Arabia.

Introduction:

The thyroid gland is the largest endocrine-shaped bow tie consisting of two lobes, which are situated on the trachea, just below Adam's apple in the neck. The main functions of thyroid gland are to secrete hormones inside the human beings, control the metabolic rate, neurocognitive, protein synthesis and growth development in children. Other function of thyroid gland is secreting calcitonin hormone that plays a role in calcium hemostasis.¹

Hyperthyroidism is characterized by increased synthesis of the thyroid hormones and thyroid gland secretion whereas thyrotoxicosis refers to the clinical condition of excess thyroid hormones in circulation, regardless of source. Graves' disease is the most common cause of hyperthyroidism accompanied by toxic nodular goiter.²

Impairment of thyroid gland to secrete their hormones cause hypothyroidism. There are two types of hypothyroidism: Primary abnormality in the thyroid gland itself or secondary/central hypothalamic or pituitary disease. About 99% of patients with hypothyroidism are diagnosed as Primary hypothyroidism.⁵

The World Health Organization (WHO) estimates that over than 190 million people suffer from iodine deficiency disorders.⁷ In the developed countries, the prevalence of hypothyroidism, the most popular type of thyroid dysfunction is 4 -5%.⁸ While thyroid dysfunction typically develops over course of their lifetime in more than 12 percent of the US population, true thyroid emergencies are rare.⁹

For evaluate and screen thyroid functions and help to diagnose thyroid disorders, the most common test is a “thyroid function test panel” which is appear level of thyroid-stimulating hormone (TSH), Free T4 (thyroxine) and Free T3 or total T3 (triiodothyronine).⁵

Autoimmune thyroiditis, dietary iodine deficiency, previous thyroid surgery or irradiation, intake of drugs, such as lithium, and pituitary, and hypothalamic disorders consider the causative factors of thyroid dysfunction.¹⁰

According to the American Thyroid Association, all adults who are 35 years or above must be screened for thyroid disorders and the serum thyrotrophic concentration every 5 years.¹¹ Awareness about thyroid disease among the Indian community is low, despite of high percentage of thyroid disease among Indian population comparing to other countries.¹² Previous studies conducted on Saudi population suggested limited awareness about this disease among Saudi general population as studies carried out by Alhazmi in 2020 among Makkah city population and by Khalifa in Riyadh city in 2019 that found poor knowledge among most of the participants regarding risk factors and prevention of thyroid diseases, and about the clinical characteristics of thyroid disease the knowledge was moderate.

For the farthest, we know there are no studies that done in Taif city about assessment of population knowledge and awareness regarding thyroid disorders, so we conduct this study that

aims to assess the degree of knowledge and attitude of thyroid disorders among the Saudi population to develop awareness measures for tackling the problem.

Participants and Methods:

Study designs and settings: A cross sectional population-based study was conducted in Taif, KSA from June 2021 to November 2021. Taif city is located on the eastern slopes of the Al-Sarawat Mountains above Makkah and Jeddah, and it is elevated about 5,600 ft meters above sea-level. According to the Central Department of Statistics and Information, residents of Taif are 1109, 84 (884,107 Saudi and 225,739 non-Saudi).¹³ Taif city was divided into four regions: East, West, North, and South. The study will include a representative sample all Participants in Taif city during the time period of the study.

Study Subjects: The study included 600 participants males and females who live in Taif city will be chosen by simple random sample with confidence level 95%, margin of error 5%.

Inclusion criteria

The following were considered as inclusion criteria:

- People who are living in the city of Taif and
- Participants who are 18 years old or over.

Exclusion criteria

The following were considered as exclusion criteria:

- Those who did not give their consent,
- People working in the health field, and
- Adolescents younger than 18.

Sample Size and Sampling technique: A random stratified sampling technique was followed. The minimum sample size for this study has been decided according to Swinscow, as follows:

$$n = Z^2 \times P \times Q$$

D2

Where:

n: Calculated sample size

Z: The z-value for the selected level of confidence (1- a) = 1.96.

P: An estimated prevalence of knowledge

Q: (1 – 0.50) = 50%, i.e., 0.50

D: The maximum acceptable error = 0.05. So,

the calculated minimum sample size was:

$n = (1.96)^2 \times 0.50 \times 0.50 = 384$. The final sample size was 600

Study Tool: An electronic based modified self-administered questionnaire (from a previous study and validated by Almuzaini¹⁰) was distributed among 600 Participants resident in Taif City to be filled. The questionnaire included socio-demographic data and questions to assess knowledge about the type and functions of the thyroid gland, its disorders, factors affecting thyroid disorders, and their common manifestations.

Data analysis and statistical tests: Data was analyzed using The Statistical Package of Social Science Software (SPSS) program version 22 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp.) for statistical analysis. Frequency and percent were used for categorical variables, while the mean and standard deviation were calculated for ongoing variables. Chi test and t test were used to assess the relation between different variables. A P value of < 0.05 was considered statistically significant.

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.

Ethical consideration: Official approvals were obtained from the Research Ethics Committee of Taif university. During the research activities, each studied participant was informed about the study objectives with a stress on the confidentiality of collected data and obtaining consents from the subjects to participate in the study.

Results:

In this study, a total of 600 participants responded to the online questionnaire. Majority of respondents were aged between 18 to 32 years and males' subjects were higher compared to the male counterparts (50.8%). Furthermore, 59.7% of the subjects had a university degree and 10.5% 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 (69.8%), and thyroid dysfunction affects blood cholesterol level (49.7%). Poor knowledge was found as regards a confirmed relationship between smoking and thyroid disturbances where only (13.8%) of the subjects answered no which was the correct answer. Furthermore, (30%) of participants knew that thyroid dysfunction is not a genetic disease (Table 2).

According to table (3); mean knowledge score of participants was 36.12. Participants who scored higher were 46.3% and considered as good knowledge level. 53.7% had bad knowledge level as they scored lower than mean score knowledge.

As illustrated in table (3): knowledge score was significantly associated with gender, educational level, working status and family income per month ($P= 0.002$, $P= 0.028$, $P= 0.003$ and $P= 0.004$ respectively).

Table (1): Sociodemographic characteristics of participants (n=600)

	Parameter	No.	Percent
Age	• 18- 32 years old	313	52.2
	• 33 - 50 years old	178	29.7
	• More than 50	109	18.2
Gender	• male	305	50.8
	• female	295	49.2
Education level	• Preparatory	4	7.
	• medium	14	2.3
	• secondary	97	16.2
	• university	358	59.7
	• Postgraduate	35	5.8
	• graduate	92	15.3
Job	• Officer	215	35.8
	• unemployed	63	10.5
	• House wife	66	11.0
	• student	184	30.7
	• retired	72	12.0
	• married	300	50.0
Social status	• single	275	45.8
	• divorced	19	3.2
	• widow	6	1.0
	• Low < 5,000 SAR.	97	16.2
family income per month	• Average 5,000 - < 10,000 SAR.	201	33.5
	• High \geq 10,000 SAR.	302	50.3

Table (2): Knowledge of participants thyroid disorders and associated factors (n=600).

	Yes	No	I don't no
The thyroid gland is an endocrine gland	419 69.8	37 6.2	144 24.0
Thyroid dysfunction affects brain development in children	286 47.7	85 14.2	229 38.2
Thyroid dysfunction affects the level of cholesterol in the blood	298 49.7	74 12.3	228 38.0
Thyroid dysfunction leads to heart disease	254 42.3	111 18.5	235 39.2
Exercise affects thyroid dysfunction	214 35.7	231 38.5	155 25.8
There is a confirmed relationship between smoking and thyroid disorders	267 44.5	83 13.8	250 41.7
Thyroid dysfunction is hereditary	218 36.3	180 30.0	202 33.7

Table (3): Knowledge of participants of symptoms of hyperthyroidism (n=600).

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Weight loss despite a good appetite is a symptom of hyperthyroidism	54 9.0	33 5.5	163 27.2	77 12.8	273 45.5
Insomnia and lack of sleep are symptoms of hyperthyroidism	35 5.8	43 7.2	197 32.8	92 15.3	233 38.8
Increased heart rate is a symptom of hyperthyroidism	56 9.3	52 8.7	194 32.3	95 15.8	203 33.8
Inability to tolerate hot weather and wearing light clothing in cold weather are	67 11.2	67 11.2	197 32.8	83 13.8	186 31.0

symptoms of hyperthyroidism					
Oligomenorrhea and amenorrhea are symptoms of hyperthyroidism	62 10.3	79 13.2	249 41.5	69 11.5	141 23.5
Sudden weight gain despite loss of appetite is a symptom of hypothyroidism	40 6.7	33 5.5	128 21.3	88 14.7	311 51.8
Fatigue and drowsiness are a symptom of hypothyroidism	38 6.3	37 6.2	159 26.5	88 14.7	278 46.3
Dry skin and hair are a symptom of hypothyroidism	44 7.3	50 8.3	193 32.2	93 15.5	220 36.7
Feeling cold in hot weather is a symptom of hypothyroidism	53 8.8	55 9.2	202 33.7	92 15.3	198 33.0

Table (4): knowledge score of participants

Mean Score	36.12	
Score Good Knowledge	278	46.3%
Score Low Knowledge	322	53.7%

Table (5): relationship between knowledge and sociodemographic features of the participants

		Knowledge score		Total (N=600)	P value
		Good knowledge	Poor knowledge		
Age	18- 32 years old	134	179	313	0.186
		48.2%	55.6%	52.2%	
	33 - 50 years old	88	90	178	
		31.7%	28.0%	29.7%	
	More than 50	56	53	109	
		20.1%	16.5%	18.2%	
Gender	male	122	183	305	0.002
		43.9%	56.8%	50.8%	
	female	156	139	295	
		56.1%	43.2%	49.2%	
Education level	Preparatory	4	0	4	0.028
		1.4%	0.0%	0.7%	
	medium	8	6	14	
		2.9%	1.9%	2.3%	
	secondary	49	48	97	
		17.6%	14.9%	16.2%	
	university	172	186	358	
		61.9%	57.8%	59.7%	
	Postgraduate	13	22	35	
		4.7%	6.8%	5.8%	
	graduate	32	60	92	
		11.5%	18.6%	15.3%	
Working status	Officer	86	129	215	0.003
		30.9%	40.1%	35.8%	
	unemployed	21	42	63	
		7.6%	13.0%	10.5%	
	House wife	35	31	66	

		12.6%	9.6%	11.0%	
	student	92	92	184	
		33.1%	28.6%	30.7%	
	retired	44	28	72	
		15.8%	8.7%	12.0%	
Social status	married	145	155	300	0.771
		52.2%	48.1%	50.0%	
	single	121	154	275	
		43.5%	47.8%	45.8%	
	divorced	9	10	19	
		3.2%	3.1%	3.2%	
widow	3	3	6		
	1.1%	0.9%	1.0%		
Family income per month	Low < 5,000 SAR.	39	58	97	0.004
		14.0%	18.0%	16.2%	
	Average 5,000 - < 10,000 SAR.	79	122	201	
		28.4%	37.9%	33.5%	
	High ≥ 10,000 SAR.	160	142	302	
		57.6%	44.1%	50.3%	

Discussion:

Thyroid dysfunction is one of the most common endocrine disorders. It accounts for approximately 30% to 40% of patients who visit the endocrinology clinic. Thyroid dysfunction is one of the most common problems in clinical practice and has become more prevalent throughout the world in recent decades; therefore, its associated risk factors have received much attention. These disorders are frequently under-diagnosed [14]. In general, lack of knowledge and understanding of thyroid disorder effects can lead patients to go undiagnosed. In Saudi Arabia, the prevalence of thyroid dysfunction is constantly increasing, especially in women [15].

According to our study, mean knowledge score of participants was 36.12. Participants who scored higher were 46.3% and considered as good knowledge level. 53.7% had bad knowledge level as they scored lower than mean score knowledge. Almuzaini et al. [10] 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 [16]. Another Saudi study in Hail reported that, 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 [17]. A study conducted at a cosmopolitan city of central India among women to assess 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 [18]. Askari et al. [19] study which was conducted on general practitioners in Iran which showed that the mean knowledge score of GPs was 39.9%. According to a cross sectional study conducted by Singh A. et al. out of 200 patients, 60 % of patients knew that thyroid is a gland situated in the neck and 50 % of patients knew about hypothyroidism and hyperthyroidism. 40 % of the patients thought that the thyroid medicines could be stopped once the thyroid function is normal [20]. A study conducted by Kumar Pradeep et al. among 250 patients revealed that 35.2% and 51.2% of patients know the meaning of thyroid and hypothyroidism respectively. Only 25.6% of patients know the type of medicines used for treatment of hypothyroidism [21].

Thyroid disorder can lead to a wide range of symptoms, including hypoplasia of erythroid cells in the bone marrow or proliferation of immature erythroid progenitor cells (due to hypothyroidism), or hyperplasia (due to hyperthyroidism). In general, thyroid dysfunction can lead to different effects on blood cells and anemia of multifarious severity and types. In our study, hyperthyroidism manifestations' knowledge were higher in our participants as (38.8%) had the knowledge that Insomnia and lack of sleep are symptoms of hyperthyroidism, and (45.5%) agreed that Loss of weight despite good appetite is a symptom of hyperthyroidism. Almuzaini et al. [10] reported that (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. Another study reported lower figures as only 25% of the respondents had given correct response on sign and symptoms of thyroid disorders [22]. Another Saudi study reported that participants knew that hypothyroidism is associated with weight gain (68.9%) and 63.4% of the responders believe that weight loss changes are associated with hyperthyroidism [23]. In comparison, the study by Rai et al., as around (50%) answered that weight gain is characteristic of hypothyroidism. Moreover, the study by Rai et al. showed that it is about 61% think fatigue is a symptom, while the current study concludes 81.7% agreeing with this information [18]. On the other hand, a study conducted in Saudi Arabia suggested that 25.3% of the population responded

by recognizing the relationship of neck swelling, constipation, and diarrhea as symptoms of thyroid disease [24].

In our study, knowledge score was significantly associated with gender, educational level, working status and family income per month. Another study reported that age, sex, education, and occupation had no significant effect on the knowledge level of the respondents ($p > 0.05$) [10]. Another Saudi study reported that mean knowledge score among the socio-demographic profiles and previous history of thyroid disease, being a female, living in Al Ahsa, being a student, those with a previous history of thyroid disease, family history of the disease, and those who underwent thyroid gland examination were significantly more associated with having better knowledge toward thyroid diseases [23]. Compared with a study conducted in Saudi Arabia, there is no significant difference between gender in the level of knowledge [25].

Conclusion:

Our study population show relatively good knowledge level compared to previous literature. Knowledge score was significantly associated with gender, educational level, working status and family income per month. Health officials should use more effective health education methods to raise public and caregiver awareness of thyroid disorders and the importance of early detection and adequate control. Patients would be more drug-compliant, follow-up on a regular basis, and distribute accurate information to their family and friends if they were more aware of and knowledgeable about their thyroid condition.

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