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ORIGINAL ARTICLE

Knowledge of thyroid disease manifestations and risk factors among Alahsa Population, Saudi Arabia

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ABSTRACT

Background: Delayed diagnosis and neglect have been associated with low general population awareness of thyroid disease manifestations and risk factors. The objective of this study was to investigate the level of awareness among the population of Alahsa regarding the manifestations and risk factors associated with thyroid diseases.

Methods: A cross-sectional study was conducted in Alahsa, Saudi Arabia, using convenient sampling techniques. An online questionnaire was distributed through social media for1 month among the general population aged 18 and older.

Results: In total, 390 individuals participated in the study, the majority worked in non-healthcare professions (73.2%). The study found that common symptoms that participants associated with needing thyroid function tests included increased body weight (64.4%), neck pain (41.3%), hair loss (40.8%), voice changes (33.6%), and depression (33.3%). Participants demonstrated awareness of common symptoms such as insomnia (51%), increased heart rate (47.2%), and temperature intolerance (46.2%). They also recognized risk factors including being female (65.4%), radiation exposure (49.2%), iodine intake (44.6%), smoking (44.6%), and pregnancy (29%). Overall, only 21.8% of participants had good knowledge about thyroid disorders, while the majority (78.2%) had a poor knowledge level.

Conclusion: The results of the study highlight the necessity to enhance knowledge and awareness regarding thyroid disorders among the population of Al-Ahsa, Saudi Arabia.

Keywords: Thyroid disease awareness, manifestation, risk factors, Alahsa, Saudi Arabia.

Introduction

The thyroid is the largest gland, which is situated anteriorly in the neck area [1]. It is modulated by the hypothalamic-pituitary-thyroid axis. Moreover, it is responsible for the release of the thyroid hormones triiodothyronine (T3) and thyroxine (T4), which influence normal growth and development [2]. Thyroid gland dysfunction is either a consequence of hormone disruption leading to hormone hyposecretion or hypersecretion or a result of abnormal changes in the thyroid structure such as gland hypertrophy and gland hyperplasia [1].

The clinical presentation of thyroid disease is non-specific and varies in different people. In hyperthyroidism, the symptoms include fatigue, weight loss, heat intolerance, and warm, moist skin. [1,3]. In cases of hypothyroidism, the symptoms include lethargy, fatigue, weight gain, cold intolerance, and dry skin [4]. In thyroid cancer, the symptoms include rapidly growing nodules, voice

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Table 1. *Socio-demographic characteristics of study participants, Al-Ahsa, Saudi Arabia (n = 390).*

Socio-demographic data	No	%
Age in years		
18-35	156	40.0%
35-50	139	35.6%
>50	95	24.4%
Gender		
Male	93	23.8%
Female	297	76.2%
Nationality		
Saudi	388	99.5%
Non-Saudi	2	.5%
Educational level		
Below secondary	20	5.1%
Secondary	95	24.4%
University	275	70.5%
Work status		
Not working	106	27.2%
Student	97	24.9%
Employee	134	34.4%
Retired	53	13.6%
Work field		
Health care field / study	76	26.8%
Non-health care field	208	73.2%

Table 2. *General knowledge and awareness about thyroid disorder among participants, Al-Ahsa, Saudi Arabia.*

General knowledge	No	%
What is the thyroid gland		
A natural gland in the body	317	81.3%
Swelling in the neck	23	5.9%
Disease	28	7.2%
I don't know	22	5.6%
What is hypothyroidism?		
Decreased secretion of thyroid hormones	265	67.9%
Increased secretion of thyroid hormones	50	12.8%
Neck swelling	18	4.6%
I don't know	57	14.6%
What is hyperthyroidism?		
Increased secretion of thyroid hormones	308	79.0%
Decreased secretion of thyroid hormones	13	3.3%
Neck swelling	12	3.1%
I don't know	57	14.6%
Symptoms make you need to have thyroid function tests?		
Increased weight	251	64.4%
Neck pain	161	41.3%
Hair loss	159	40.8%
Voice change	131	33.6%
Depression	130	33.3%
Skin problems	81	20.8%
Infertility	67	17.2%
Joint pain	64	16.4%
Constipation	58	14.9%
Irregular menstrual cycles	5	1.3%
Sore throat	73	18.7%
I don't know	80	20.5%

horsiness, dysphasia, and dyspnea [5]. There are various complications caused by thyroid disorders that have significant implications for mental health, leading to depression, menstrual irregularities, fertility issues, and ocular health [6-8]. Additionally, thyroid disorders, particularly hyperthyroidism, can cause cardiovascular complications. In the early stage, hyperthyroidism leads to high cardiac output and left ventricular hypertrophy, progressing to biventricular dilatation and congestive heart failure in the late stage [9]. Thyroid disorders are the most prevalent endocrine diseases [10]. Approximately 200 million individuals worldwide are believed to be impacted by thyroid diseases [11]. In Saudi Arabia, the prevalence of thyroid dysfunction is estimated to be 49.76% among approximately 10,000 people, according to a study conducted in the Asir region [12].

Lack of general knowledge among patients may be of great concern as thyroid diseases are one of the most underdiagnosed and neglected medical conditions; reducing the prevalence of the ailment largely depends on increasing awareness of the condition [13]. While some studies have explored knowledge of thyroid disease manifestations and risk factors in different regions, such a study has not yet been conducted specifically in the population of Al-Ahsa, Saudi Arabia. Understanding the knowledge level of the Alahsa population is crucial for tailored health education interventions, early detection, and effective management of thyroid diseases. By conducting this research, we aim to assess the knowledge of thyroid disease manifestations and risk factors among the population of Alahsa, Saudi Arabia.

Subjects and Methods

This cross-sectional study was conducted from October to December 2023 by using convenient sampling techniques in Alahsa, Saudi Arabia, to assess the knowledge of thyroid disease manifestations and risk factors. An online questionnaire was distributed through social media for one month. The included criteria were as follows: the general population aged 18 and older lived in the Alahsa region of Saudi Arabia. The exclusion criteria

***Table 3**. Participants knowledge and awareness about thyroid disease symptoms and risk factors, Al-Ahsa, Saudi Arabia.*

Domain	Items	Yes	No	I don't know
Symptoms of thyroid disorders	Insomnia and sleep disturbance	51.0%	9.7%	39.2%
	Inability to tolerate hot weather and wear light clothing in cold weather	46.2%	12.3%	41.5%
	Feeling cold in hot weather	43.3%	13.6%	43.1%
	Increased heart rate	47.2%	11.0%	41.8%
Risk factors of thyroid disorders	Smoking	44.6%	15.6%	39.7%
	Radiation exposure	49.2%	13.1%	37.7%
	Inadequate or excess iodine intake	44.6%	9.5%	45.9%
	Female gender	65.4%	7.9%	26.7%
	Pregnancy and the postpartum period	29.0%	23.8%	47.2%
	Amiodarone drug	15.6%	8.5%	75.9%
	Lithium medication	18.2%	7.7%	74.1%

***Table 4.** Factors associated with participants overall knowledge level about thyroid diseases.*

Demographic data	Overall knowledge level				*p*-value
	Poor		Good		
	No		No		
Age in years					
18-35	98	62.8%	58	37.2%	0.001*
35-50	119	85.6%	20	14.4%	
> 50	88	92.6%	7	7.4%	
Gender					
Male	84	90.3%	9	9.7%	0.001*
Female	221	74.4%	76	25.6%	
Nationality					
Saudi	304	78.4%	84	21.6%	0.333^
Non-Saudi	1	50.0%	1	50.0%	
Educational level					
Below secondary	18	90.0%	2	10.0%	0.394
Secondary	75	78.9%	20	21.1%	
University	212	77.1%	63	22.9%	
Work status					
Not working	85	80.2%	21		0.001*
Student	49	50.5%	48		
Employee	119	88.8%	15	19.8% 49.5% 11.2%	
Retired	52	98.1%	1	1.9%	
Work field					
Health care field	24	31.6%	52	68.4%	0.001*
Non-health care field	196	94.2%	12	5.8%	

*$p < 0.05$ (significant).
P: Pearson X^2 test ^: Exact probability test

will be as follows: people from areas other than the Alahsa region. People who are less than 18 years of age. Reducing the selection sampling bias was done by using diversity in distributing the survey on different social media applications and at multiple different times. The survey has been divided into two sections. The first one is biographical data. The second section included questions to assess the knowledge of thyroid dysfunction. The purpose of the study and the estimated time to answer the questions were provided with online consent, which was obtained before filling out the survey; however, all the participants who refused to give their consent will be excluded. Sample size calculation was performed using RAO Soft. The confidence level was set at 95%, the responses distribution was set at 50%, and the level of precision was 5%; the sample size was calculated to be 385. By adding 10% non-responses sample size will be 425. Statistical Package for Social Science (SPSS), Windows 26.0 version, was used to analyze the data, and Microsoft Excel 2016 was used to present the analyzed data on tables and graphs. The frequency of the questions was calculated to show the total responses for each choice

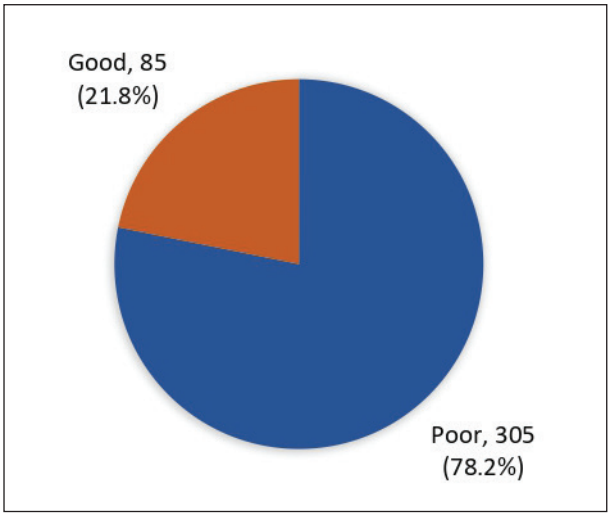

Figure 1. *Overall knowledge and awareness about thyroid diseases among study participants.*

the survey contains. As most of the questions were based on qualitative data, chi-square was used as the main statistical and analytical test to assess the knowledge of the participants. A *p*-value of less than 0.05 was deemed significant.

The data were collected, reviewed, and then fed to SPSS 21. All statistical methods used were two-tailed with an alpha level of 0.05 considering significance if the *p*-value is less than or equal to 0.05. Overall knowledge and awareness levels regarding thyroid diseases were assessed by summing up discrete scores for different correct awareness items. The overall awareness score was categorized as a poor level if the participants' score was less than 60% of the overall score and a good level of awareness was considered if the participants' score was 60% or more of the overall score. Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including participants' personal data, educational level, work data, and work field. Also, participants' knowledge and awareness about thyroid diseases, signs and symptoms, and risk factors were tabulated while the overall knowledge level was graphed. Cross tabulation for showing factors associated with participants' knowledge about thyroid diseases using Pearson chi-square test for significance and exact probability test if there were small frequency distributions.

Results

A total of 390 eligible participants completed the study questionnaire. Participants' ages ranged from 18 to more than 50 years with a mean age of 39.8 ± 11.4 years old. A total of 297 (76.2%) were females and the vast majority (99.5%; 388) were Saudi. As for educational level, 275 (70.5%) had a university level of education, and 95 (24.4%) had a secondary education. Considering work status, 106 (27.2%) were not working, 134 (34.4%) were employees, 97 (24.9%) were students and 53 (13.6%) were retired. As for the work field, 208 (73.2%) were non-healthcare workers and 76 (26.8%) were healthcare worker/student (Table 1).

Table 2. General knowledge and awareness about thyroid disorder among participants, Al-Ahsa, Saudi Arabia. A total of 317 (81.3%) correctly defined the thyroid gland as a natural gland in the body, 265 (67.9%) correctly defined hypothyroidism as a decreased secretion of thyroid hormones, and 308 (79%) defined hyperthyroidism as an increased secretion of thyroid hormones. With regard to symptoms that make a person need to have thyroid function tests, the most reported were increased body weight (64.4%), neck pain (41.3%), hair loss (40.8%), voice changes (33.6%), and depression (33.3%).

Table 3. Participants' knowledge and awareness about thyroid disease symptoms and risk factors, Al-Ahsa, Saudi Arabia. Regarding symptoms, the most known included insomnia and sleep disturbance (51%), increased heart rate (47.2%), and inability to tolerate hot weather and wear light clothing in cold weather (46.2%). As for risk factors, the most known were female gender (65.4%), radiation exposure (49.2%), inadequate or excess iodine intake (44.6%), smoking (44.6%), and pregnancy (29%).

Figure 1. Overall knowledge and awareness about thyroid diseases among study participants. A total of 85 (21.8%) of the study participants had an overall good knowledge of thyroid disorders while the vast majority (78.2%; 305) had a poor knowledge level.

Table 4. Factors associated with participants' overall knowledge level about thyroid diseases. A total of 37.2% of participants aged 18-35 years had an overall good knowledge level versus 7.4% of old-aged participants with a recorded statistical significance ($p = 0.001$). Also, 25.6% of female participants had a good knowledge level compared to 9.7% of males ($p = 0.001$). An overall good knowledge was detected among 49.5% of students in comparison to 1.9% of the retired group ($p = 0.001$). Also, 68.4% of healthcare field/study workers had an overall good knowledge of thyroid disease compared to 5.8% of others ($p = 0.001$).

Discussion

The current study aimed to assess public knowledge and awareness about thyroid diseases and risk factors in Al-Ahsa, Saudi Arabia. Globally, the disease prevalence is increasing, and the incidence in women is higher than in men. Thyroid prevalence in middle-aged women was 7%]14-16[. In reference to recent estimates, the prevalence of hypothyroidism in Saudi Arabia was 49.76%, with subclinical hypothyroidism being the most common type in 39.2% of Saudis, while primary hypothyroidism was recorded in 5.3%]12[. The clinical symptoms of the thyroid mostly depend on the type of thyroid gland (hypothyroidism, hyperthyroidism, or thyroid nodules) and can change several physiological

functions of the body, including metabolism]17[. Thyroid diseases are also often overlooked or confused with other diseases because most symptoms are non-specific]18[.The current study revealed that only one-fifth of the study participants had good knowledge about thyroid disorders. In more detail, most of the participants correctly defined the thyroid gland, and also defined hyperthyroidism but nearly two-thirds correctly defined hypothyroidism. Increased body weight, neck pain, hair loss, voice changes, and depression were known as the flag symptoms to seek for thyroid profile assessment. A similar finding in Saudi Arabia was reported by Alhazmi RA et al. [13] where two-thirds said unexplained weight loss could be a sign of cancer, while 40.9% were not sure. Other symptoms such as persistent bowel changes (22.1%), and an ulcer that does not.

Conclusion

One-fifth of the participants showed good knowledge about thyroid disorders. The results of the study highlight the necessity to enhance knowledge and awareness regarding thyroid disorders among the population of Al-Ahsa, Saudi Arabia.

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List of Abbreviations

SPSS Statistical Package for the Social Sciences

Conflict of interest

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

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Consent to participate

Written informed consent was obtained from all the participants.

Ethical approval

Ethical approval for the current study was obtained from the Deanship of Scientific Research Committee at King Faisal University dated 11/06-2023.

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References

1. Alyahya A, AlNaim A, AlBahr AW, Almansour F, Elshebiny A. Knowledge of thyroid disease manifestations and risk factors among residents of the Eastern Province, Saudi Arabia. Cureus. 2021;13(1):e13035.
2. Zhou Q, Xue S, Zhang L, Chen G. Trace elements and the thyroid. Front Endocrinol (Lausanne) 2022;13:904889. https://doi.org/10.3389/fendo.2022.904889
3. Doubleday AR, Sippel RS. Hyperthyroidism. Gland Surg. 2020;9(1):124–35. https://doi.org/10.21037/gs.2019.11.01
4. Wilson SA, Stem LA, Bruehlman RD. Hypothyroidism: diagnosis and treatment. Am Fam Physician. 2021;103(10):605–13.
5. Carling T, Udelsman R. Thyroid cancer. Annu Rev Med. 2014;65:125–37. https://doi.org/10.1146/annurev-med-061512-105739
6. Hage MP, Azar ST. The link between thyroid function and depression. J Thyroid Res. 2012;2012:590648 https://doi.org/10.1155/2012/590648
7. Poppe K, Velkeniers B, Glinoer D. Thyroid disease and female reproduction. Clin Endocrinol. 2007;66(3):309–21. https://doi.org/10.1111/j.1365-2265.2007.02752.x
8. Bahn RS. Graves' Ophthalmopathy. New Eng J Med. 2010;362(8):726–38. https://doi.org/10.1056/NEJMra0905750
9. Mejia Osuna P, Udovcic M, Sharma, MD. Hyperthyroidism and the heart. Methodist DeBakey Cardiovas J. 2017;13(2):60. doi: 10.14797/mdcj-13-2-60. https://doi.org/10.14797/mdcj-13-2-60
10. American Thyroid Association. General information. Falls Church, VA: American Thyroid Association; 2019. Vol 2019.
11. Kuyl JM. The evolution of thyroid function tests. J Endocrinol Metab Diabetes S Afr. 2015;20:11–6.
12. Alqahtani SAM. Prevalence and characteristics of thyroid abnormalities and its association with anemia in ASIR Region of Saudi Arabia: a cross-sectional study. Clin Pract. 2021 Aug 6;11(3):494–504. https://doi.org/10.3390/clinpract11030065
13. Alhazmi RA, Alobaid AM, Althunayyan SM, Syed W, Al-Rawi MBA. A cross- sectional assessment of knowledge, awareness of risk factors, and perceptions of thyroid disease (TD) among adults living in Saudi Arabia - A community-based study. Front Public Health. 2022;10:1041745.
14. Poppe K, Bisschop P, Fugazzola L, Minziori G, Unuane D, Weghofer A. 2021 European thyroid association guideline on thyroid disorders prior to and during assisted reproduction. Eur Thyroid J. 2021 Feb 1;9(6):281–95. https://doi.org/10.1159/000512790
15. Massoudi MS, Meilahn EN, Orchard TJ, Foley Jr TP, Kuller LH, Costantino JP, et al. Prevalence of thyroid antibodies among healthy middle-aged women: findings from the thyroid study in healthy women. Ann Epidemiol. 1995;5(3):229–33. https://doi.org/10.1016/1047-2797(94)00110-F

16. Benseñor IM, Goulart AC, Lotufo PA, Menezes PR, Scazufca M. Prevalence of thyroid disorders among older people: results from the São Paulo Ageing & Health Study. Cadernos de saude publica. 2011;27:155–61. https://doi.org/10.1590/S0102-311X2011000100016

17. Gharib H, Papini E. Thyroid nodules: clinical importance, assessment, and treatment. Endocrinol Metabol Clin North Am. 2007 Sep 1;36(3):707–35. https://doi.org/10.1016/j.ecl.2007.04.009

18. Walsh JP. Managing thyroid disease in general practice. Med J Australia. 2016 Aug;205(4):179–84. https://doi.org/10.5694/mja16.00545