



Knowledge of hypothyroidism associated disorders and symptoms: A Saudi community-based study

Fayez Saud Alreshidi¹✉, Nahlah Fahad Alreshidi²

¹Department of Family and community medicine, College of Medicine, University of Ha'il, Saudi Arabia

²Department of internal medicine, College of Medicine, University of Ha'il, Saudi Arabia

✉ **Correspondence to:**

Dr. Fayez Saud Alreshidi,
Department of Family and community medicine,
College of Medicine,
University of Ha'il, Saudi Arabia

Article History

Received: 13 June 2020

Reviewed: 14/June/2020 to 13/July/2020

Accepted: 14 July 2020

E-publication: 21 July 2020

P-Publication: September - October 2020

Citation

Fayez Saud Alreshidi, Nahlah Fahad Alreshidi. Knowledge of hypothyroidism associated disorders and symptoms: A Saudi community-based study. *Medical Science*, 2020, 24(105), 2870-2876

Publication License



This work is licensed under a Creative Commons Attribution 4.0 International License.

General Note

Article is recommended to print as color digital version in recycled paper.

ABSTRACT

Background: Hypothyroidism is one of the missed diagnosed diseases with high prevalence rates in several geographical regions of Saudi Arabia. The current study aimed to assess the knowledge of hypothyroidism associated disorders and symptoms in a Saudi community-based study. *Methodology:* This was a descriptive cross-sectional study, included 900 Saudi volunteers recruited in Hail

Region. The participants were randomly recruited in the current study irrespective of their age, sex, or other demographical characteristics. *Results:* Around 645/900(72%) of the participants were able to define hypothyroidism (117/170(69%) were males and 528/730(72%) were females). Around 475/900(53%) of the participants believed that Hypothyroidism is diagnosed by measuring TSH level in the blood (76/170(45%) were males and 399/730(55%) were females). *Conclusion:* Knowledge towards hypothyroidism symptoms and related disorders is relatively low amongst the Saudi community. Implementation of a sustainable hypothyroidism control program is deemed necessary in Northern Saudi Arabia.

Keywords: hypothyroidism, symptoms, thyroid hormone, Saudi Arabia

1. INTRODUCTION

Hypothyroidism is a thyroid gland disorder usually associated with thyroid hormones (thyroid-stimulating hormone (TSH), triiodothyronine (T3), and thyroxine (T4) deficiency. Although the diseases can be diagnosed and managed, it can have fatal outcomes if untreated. The diagnosis of hypothyroidism depends on clinical manifestations and relevant biochemical factors. Changes in voice pattern, dry skin, fatigue, lethargy, constipation, and cold intolerance represent the major symptoms of hypothyroidism in adults (Chaker et al., 2017; Hu et al., 2019).

Abnormality of the thyroid gland is associated with several endocrine abnormalities that occur in 10% of people throughout their life span. Thyroid hormones are important for normal metabolism and development and their declined levels are associated with diverse disorders including weight alterations, osteoporosis, atrial fibrillation, and psychiatric abnormalities (Porcu et al., 2013; Persani et al., 2019).

Hypothyroidism is highly prevalent in Saudi Arabia, though there is a limited hospital-based study in this context. Most Saudi patients with hypothyroidism are younger and females (Khalid et al., 2019; Rahaf Albaqawi et al. 2020). The prevalence of subclinical hypothyroidism was found to be 10% among adults visiting the primary health centers in Riyadh, Saudi Arabia. Elderly adults with subclinical hypothyroidism usually showing higher levels of TSH, which necessitate regular screening of this section of the population (Eidan et al., 2018; Brokhin et al., 2019). As several hypothyroidism symptoms are mild, many cases are not detected, particularly amongst population abstaining established thyroid dysfunction control programs. Consequently, the current study aimed to assess the knowledge of hypothyroidism associated disorders and symptoms: A Saudi community-based study.

2. MATERIALS AND METHODS

In this descriptive cross-sectional study, 900 Saudi volunteers were recruited in Hail Region, Northern Saudi Arabia, during the period from October 2019 to March 2020. Out of the recruited population, 900 individuals have responded to contribute to this investigation. The participants were randomly recruited in the current study irrespective of their age, sex, or other demographical characteristics.

A purposeful questionnaire was designed to get data about community knowledge and attitude towards hypothyroidism symptoms and related disorders. Beside demographical characteristics, information regarding hypothyroidism was composed over questions included; Thyroid gland is a butterfly-shaped gland located in the neck, Hypothyroidism is a medical condition results from low thyroid hormones, Hypothyroidism is diagnosed by measuring TSH level in the blood, Hypothyroidism is treatable, Hypothyroidism may cause cold intolerance, Hypothyroidism may cause skin dryness, Hypothyroidism may cause fatigue, Hypothyroidism may cause muscular pain, Hypothyroidism may cause constipation, Hypothyroidism may cause weight gain, Hypothyroidism may cause abnormal menstruation, Hypothyroidism may cause neck swelling or abnormality, Hypothyroidism may increase the risk of depression, Hypothyroidism may increase the risk of high cholesterol.

3. RESULTS

Of the 900 volunteers who participated in this study, 170/900(19%) were males and 730/900(81%) were females. The majority of participants were aged 18-25 years followed by >45 years, and 26-35 years, representing 347/900(38.6%), 161/900(17.9%), and 159/900(17.7%), respectively. Most study subjects were with the university level of education 657/900(73%) followed by secondary school 149/900(16.6%), as shown in Fig 1.

About 617/900(69%) of the participants were able to define the thyroid glands (103/170(61%) were males and 513/730(70%) were females). Around 645/900(72%) of the participants were able to define hypothyroidism (117/170(69%) were males and

528/730(72%) were females). Around 475/900(53%) of the participants believed that Hypothyroidism is diagnosed by measuring TSH level in the blood (76/170(45%) were males and 399/730(55%) were females).

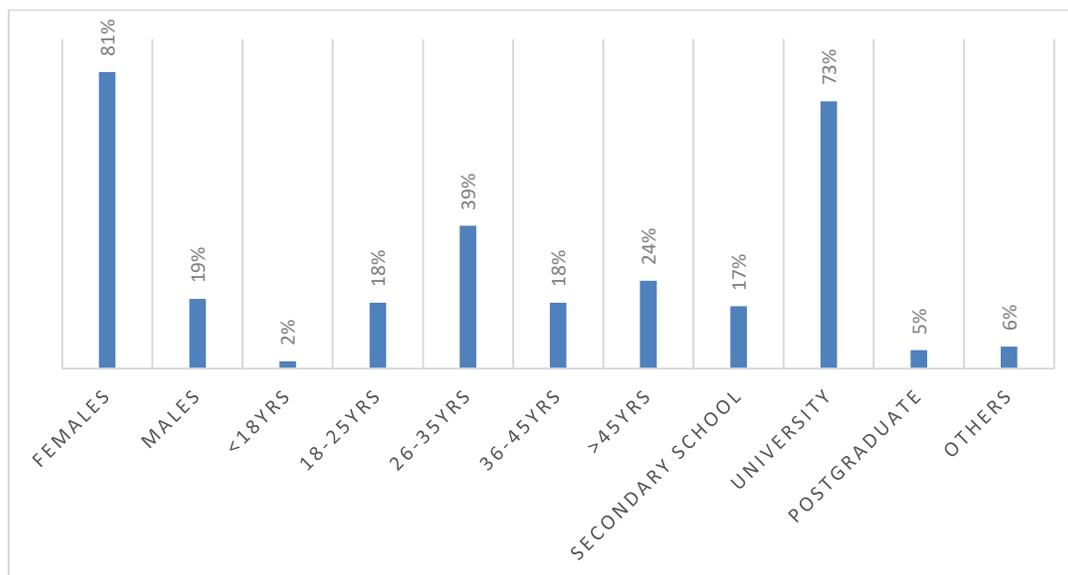


Figure 1. Description of the study population by gender, age, and education

Around 687/900(76%) of the participants believe that Hypothyroidism is treatable (115/170(68%) were males and 572/730(78%) were females), as indicated in Table 1, Fig 2.

Table 1. Distribution of the study subjects by basic thyroid knowledge

Category	Variable	Males	Females	Total
<i>The thyroid gland is a butterfly-shaped gland located in the neck</i>				
	Yes	103	513	617
	No	10	31	41
	Don't know	57	186	243
	Total	170	730	900
<i>Hypothyroidism is a medical condition that results from low thyroid hormones</i>				
	Yes	117	528	645
	No	4	32	36
	Don't know	49	170	219
	Total	170	730	900
<i>Hypothyroidism is diagnosed by measuring TSH level in the blood</i>				
	Yes	76	399	475
	No	11	33	44
	Don't know	83	298	381
	Total	170	730	900
<i>Hypothyroidism is treatable</i>				
	Yes	115	572	687
	No	11	43	54
	Don't know	44	115	159
	Total	170	730	900

Cold intolerance, as a symptom of hypothyroidism, was identified by 510/900(57%) (72/170(42%) males and 438/730(60%) females). Skin dryness, as a symptom of hypothyroidism, was identified by 519/900(58%) (72/170(42%) males and 447/730(61%) females). Fatigue as a symptom of hypothyroidism was identified by 725/900(81%) (112/170(66%) males and 613/730(84%) females).

Muscular pain as a symptom of hypothyroidism was identified by 580/900(64%) (90/170(53%) males and 490/730(67%) females). Constipation, as a symptom of hypothyroidism, was identified by 329/900(37%) (72/170(42%) males and 438/730(60%) females).

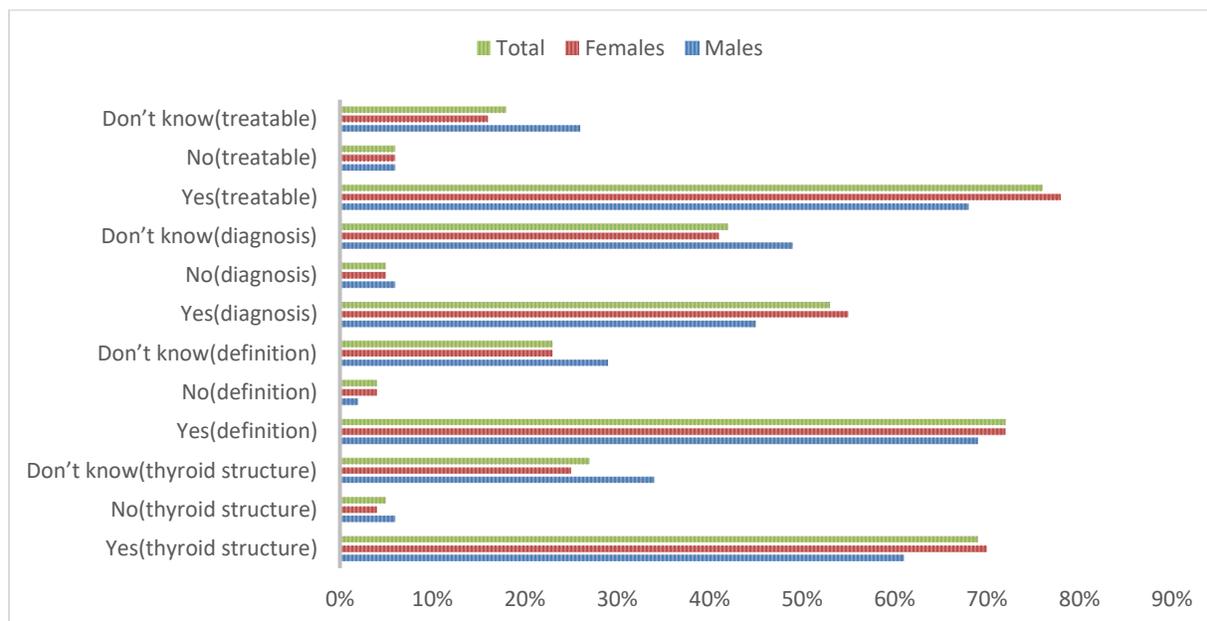


Figure 2. The study subjects by basic thyroid knowledge

Weight gain as a symptom of hypothyroidism was identified by 686/900(76%) (102/170(60%) males and 584/730(80%) females). Abnormal menstruation as a symptom of hypothyroidism was identified by 592/900(66%) (72/170(42%) males and 520/730(71%) females).

Neck swelling or abnormality as a symptom of hypothyroidism was identified by 412/900(46%) (83/170(49%) males and 329/730(45%) females), as indicated in Table 2, Fig 3.

Table 2. Distribution of the study subjects by knowledge of hypothyroidism symptoms

Category	Variable	Males (n=170)	Females (n=730)	Total (n=900)
<i>Hypothyroidism may cause cold intolerance</i>				
	Yes	72	438	510
	No	20	85	105
	Don't know	78	207	285
<i>Hypothyroidism may cause skin dryness</i>				
	Yes	72	447	519
	No	17	50	67
	Don't know	81	233	314
<i>Hypothyroidism may cause fatigue</i>				
	Yes	112	613	725
	No	11	16	27
	Don't know	47	101	148
<i>Hypothyroidism may cause muscular pain</i>				
	Yes	90	490	580
	No	13	49	62
	Don't know	67	191	258
<i>Hypothyroidism may cause constipation</i>				
	Yes	55	274	329
	No	23	126	149
	Don't know	92	330	422

<i>Hypothyroidism may cause weight gain</i>				
	Yes	102	584	686
	No	16	50	66
	Don't know	52	96	148
<i>Hypothyroidism may cause abnormal menstruation</i>				
	Yes	72	520	592
	No	4	55	59
	Don't know	94	155	249
<i>Hypothyroidism may cause neck swelling or abnormality</i>				
	Yes	83	329	412
	No	20	135	155
	Don't know	67	266	333

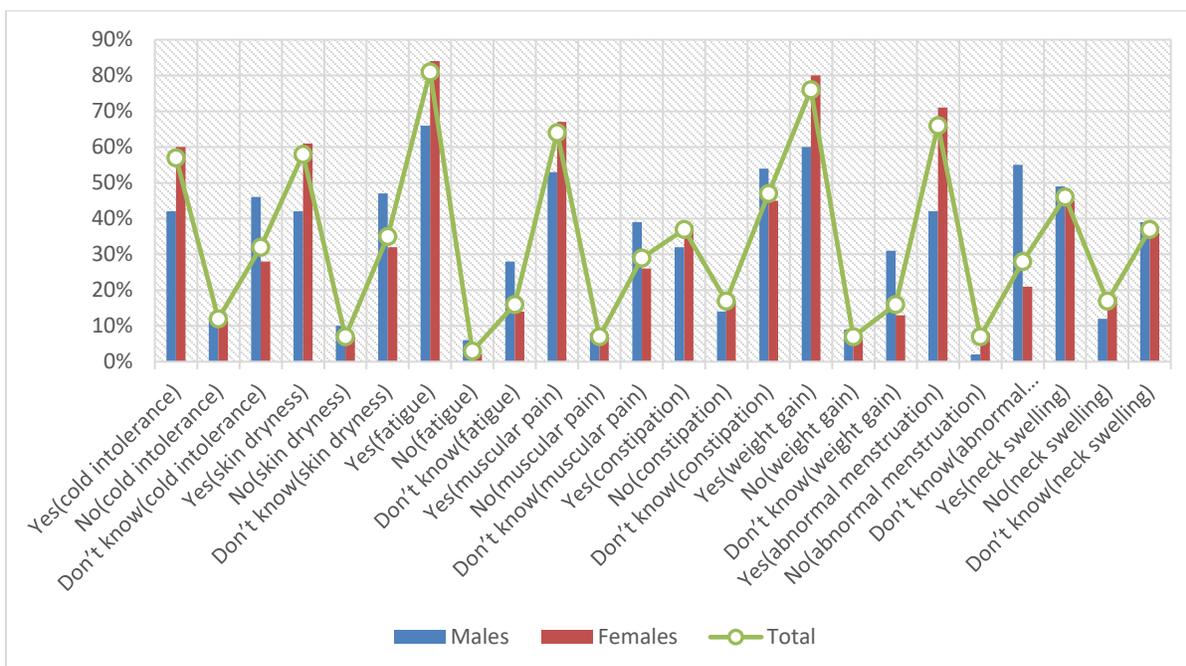


Figure 3. The study subjects by knowledge of hypothyroidism symptoms

On asking the participants, whether “Hypothyroidism may increase the risk of depression” 534/900(59%) answered, “Yes” (91/170(54%) were males and 443/730(61%) were females).

On asking the participants, whether “Hypothyroidism may increase the risk of high cholesterol” 405/900(45%) answered “Yes” (69/170(38%) were males and 336/730(46%) were females), as described in Table 3.

Table 3. Distribution of the study subjects by knowledge of hypothyroidism related disorders

Category	Variable	Males	Females	Total
<i>Hypothyroidism may increase the risk of depression</i>				
	Yes	91	443	534
	No	7	56	63
	Don't know	72	231	303
	Total	170	730	900
<i>Hypothyroidism may increase the risk of high cholesterol</i>				
	Yes	69	336	405
	No	13	58	71
	Don't know	88	336	424
	Total	170	730	900

4. DISCUSSION

Hypothyroidism is one of the missed diagnosed diseases with high prevalence rates in several geographical regions of Saudi Arabia. As the clinical manifestations of hypothyroidism have broad-spectrum ranging for mild undetected symptoms to severe life-threatening clinical manifestations, increasing community awareness and knowledge about hypothyroidism can reduce the overall burden of the disease by early detection of patients before reaching the potential severe state. Consequently, in the present study, we tried to assess the knowledge of the general Saudi population about the symptoms of hypothyroidism and expected co-disorders.

In the present study around 69%, 72%, and 53% of the study population were able to identify the thyroid gland structure, define hypothyroidism, and diagnose. These percentages showing a relatively higher knowledge which might be attributed to the high prevalence of the hypothyroidism in Saudi population (Alruwaili et al., 2018).

Around 76% of the participants believe that Hypothyroidism is a treatable disorder. Several forms of hypothyroidism are considered as treatable particularly if detected early and the hormone deficiency replaced (Chakera et al., 2012).

Cold intolerance, Skin dryness, Fatigue, Muscular pain, Constipation, Weight gain, as hypothyroidism prime symptoms were notified by 57%, 58%, 81%, 64%, 37%, and 76%, respectively. These findings showing low knowledge in most factors, which necessitate further intervention. Hypothyroidism symptoms usually more apparent in women than in men, particularly over autoimmune hypothyroidism and likely obstinate symptoms frequently remain in women following hypothyroidism treatment (Carlé et al., 2015). Obesity/overweight is commonly experienced in patients with hypothyroidism. It was reported that body mass index (BMI) is inversely correlated with the level of free thyroxine. Leptin, an anti-obesity hormone produced by fat cells, it opposes obesity through its anorexic influence on hypothalamic appetite regulation. It was suggested that the thyroid hormone reduces the impact of leptin in the regulation of appetite (Aiceles et al., 2016). Several muscular conditions have been linked to hypothyroidism such as polyarthritis, generalized minuscular stiffness, hypothyroid myopathy, etc. (Radu et al., 2016). Fatigue is one of the most encountered symptoms in patients with hypothyroidism (Antonelli et al., 2019). High incidence of constipation (Talebi et al., 2020), as well as, cold intolerance (Koehler et al., 2018) are commonly seen among patients with hypothyroidism.

Abnormal menstruation as a symptom of hypothyroidism was identified by 66% of the participants. Mensural cycle patterns and infertility are significantly influenced by female patients with hypothyroidism. Women with hypothyroidism frequently experiencing menstrual abnormalities and fertility disorders (Urmi et al., 2015).

The effect of hypothyroidism is significant on the menstrual pattern and on fertility. Hypothyroid women had more menstrual disorders and also suffering from sub-fertility. Neck mass (goiter) associated with hypothyroidism due to thyroid dysmorphogenesis was reported (Figueiredo et al., 2018).

The present study provided a good map for developing a sustainable thyroid disorder program in Saudi Arabia, but it has some limitations including its cross-sectional setting, sex imbalance, and relatively younger age study population.

5. CONCLUSION

Knowledge towards hypothyroidism symptoms and related disorders is relatively low amongst the Saudi community. Implementation of a sustainable hypothyroidism control program is deemed necessary in Northern Saudi Arabia.

Acknowledgment

The authors would like to thank participants for their time and participation.

Author Contributions:

- FSA: Conception, analysis, drafting, approval of the final version.
- NFA: Conception, design, data acquisition, approval of the final version.

Funding

This research has been funded by the authors

Conflict of interest

The authors declare no conflict of interest

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards (ethical approval number HREC EC-00051a/CM/UOH.01/19).

Data and materials availability

All data associated with this study are present in the paper.

REFERENCES AND NOTES

- Aiceles V, da Fonte Ramos C. A link between hypothyroidism, obesity and male reproduction. *Horm Mol Biol Clin Investig*. 2016;25(1):5-13. doi:10.1515/hmbci-2015-0054.
- Alruwaili , Anwar Eid M, Alshalan, Maha Hazzaa F, et al. Prevalence of Hypothyroidism and Its Associated Risk Factors in Arar City, Saudi Arabia. *The Egyptian Journal of Hospital Medicine* 2018;71 (3):2765-2769.
- Antonelli A, Fallahi P, Di Bari F, Giuggioli D, Ferrari SM, Ferri C. Fatigue in patients with systemic sclerosis and hypothyroidism. A review of the literature and report of our experience. *Clin Exp Rheumatol*. 2017;35 Suppl 106(4):193-197.
- BrokhinMatvey, Danzi Sara, Klein Irwin. Assessment of the Adequacy of Thyroid Hormone Replacement Therapy in Hypothyroidism. *Frontiers in Endocrinology* 2019;10: 631. DOI=10.3389/fendo.2019.00631.
- Carlé A, Pedersen IB, Knudsen N, Perrild H, Ovesen L, Laurberg P. Gender differences in symptoms of hypothyroidism: a population-based DanThyr study. *Clin Endocrinol (Oxf)*. 2015;83(5):717-725. doi:10.1111/cen.12787.
- Chaker L, Bianco AC, Jonklaas J, Peeters RP. Hypothyroidism. *Lancet*. 2017; 390(10101):1550-1562. doi:10.1016/S0140-6736(17)30703-1.
- Chakera AJ, Pearce SH, Vaidya B. Treatment for primary hypothyroidism: current approaches and future possibilities. *Drug Des Devel Ther*. 2012;6:1-11. doi:10.2147/DDDT.S12894.
- Eidan Al Eidan, Saeed Ur Rahman, Saeed Al Qahtani, Ali I Al Farhan & Imad Abdulmajeed. Prevalence of subclinical hypothyroidism in adults visiting primary health-care setting in Riyadh, *Journal of Community Hospital Internal Medicine Perspectives* 2018, 8:1, 11-15, DOI: 10.1080/20009666.2017.1422672.
- Figueiredo CM, Falcão I, Vilaverde J, et al. Prenatal Diagnosis and Management of a Fetal Goiter Hypothyroidism due to Dyshormonogenesis. *Case Rep Endocrinol*. 2018;2018:9564737. doi:10.1155/2018/9564737.
- Hu Y, Zhang Z, Qin K, et al. Environmental pyrethroid exposure and thyroid hormones of pregnant women in Shandong, China. *Chemosphere*. 2019; 234:815-821. doi:10.1016/j.chemosphere.2019.06.098.
- Khalid SJ Aljabri, Ibrahim M Alnasser, Fachartz, Samia A Bokhari, et al. The frequency of hypothyroidism in Saudi community based hospital: A retrospective single centre study. *Trends Diabetes Metab*, 2019;2:1-2. doi: 10.15761/TDM.1000107.
- Koehler VF, Reincke M, Spitzweg C. Hypothyreose – wann und wie behandeln? [Hypothyroidism-when and how to treat?] [published correction appears in *Internist (Berl)*. 2018 Oct 25;:]. *Internist (Berl)*. 2018;59(7):644-653. doi:10.1007/s00108-018-0438-x.
- Persani L, Cangiano B, Bonomi M. The diagnosis and management of central hypothyroidism in 2018. *Endocr Connect*. 2019;8(2):R44-R54. doi:10.1530/EC-18-0515.
- Porcu E, Medici M, Pistis G, et al. A meta-analysis of thyroid-related traits reveals novel loci and gender-specific differences in the regulation of thyroid function. *PLoS Genet*. 2013;9(2):e1003266. doi:10.1371/journal.pgen.1003266.
- Radu L, Groppa L, Vudu L. Musculoskeletal Impairment In Primary Hypothyroidism. *Rev Med Chir Soc Med Nat Iasi*. 2016;120(2):244-251.
- Rahaf Albaqawi, Meshael Alreshidi, Adeeb Almuheib, Fouad Aladel, Ibrahim Alrashidi. Awareness, knowledge and attitudes regarding radiofrequency ablation as treatment option for thyroid nodules in Saudi Arabia. *Med Sci*, 2020, 24(104), 2439-2444
- Talebi S, Karimifar M, Heidari Z, et al. The effect of synbiotic supplementation on anthropometric indices, appetite, and constipation in people with hypothyroidism: A randomized, double-blind, placebo-controlled trial. *Phytother Res*. 2020;10.1002/ptr.6710. doi:10.1002/ptr.6710.
- Urmi SJ, Begum SR, Fariduddin M, et al. Hypothyroidism and its Effect on Menstrual Pattern and Fertility. *Mymensingh Med J*. 2015;24(4):765-769.