RESEARCH ARTICLE

# Knowledge, attitude, and practice about hypothyroidism among doctors working at two hospitals and one primary healthcare sector in Al-Rasafa Baghdad

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## ABSTRACT

**Introduction**: Hypothyroidism is a common condition of thyroid hormone deficiency, which is readily diagnosed and managed but potentially fatal in severe cases if untreated. Awareness among healthcare physicians is important to improve the outcomes of hypothyroidism.

**Objective**: To assess knowledge, attitudes, and practices among doctors regarding hypothyroidism at Al-Nu'man Teaching Hospital, Dhari Al-Fayad General Hospital and Primary Health Centers of Al-Shaab Primary health care sector.

**Methods**: A cross-sectional study was conducted at Al-Nu'man Teaching Hospital, Martyr Dhari Al-Fayad General Hospital and Primary Healthcare Centers of Al-Shaab Primary Healthcare Sector in Baghdad, Iraq. The study was conducted from the 1st of July 2024 to the 1st of March 2025. We included 86 doctors, 41 residents, 30 specialists, and 15 general practitioners who participated in our study. The final questionnaire contained 35 questions on the following: Demographics characteristics (5 questions), knowledge section (20 questions), attitude section (4 questions), and practice section (6 questions). The chi-square test was used to investigate the association between demographics. A p-value less than 0.05 was considered significant.

**Results**: Of 86 doctors, 41(47.67%) residents and 9(10.46%) internal Medicine specialists, 13(15.11%) obstetrics and gynecology specialists, and 8(9.30%) family Medicine specialists and15(17.44%) general practitioners were participated in the study. 56 (65.11%) doctors had overall good knowledge. Fifty-one (59.30%) doctors had a positive attitude, and 73 (84.88%) had an adequate practice.

**Conclusion**: Doctors generally demonstrated good knowledge, a positive attitude, and adequate practice regarding hypothyroidism.


**Key words**: Physicians, hypothyroidism, knowledge, attitude, practice, Iraq.

## INTRODUCTION

Hypothyroidism includes patients with low T4 levels.[1] Subclinical hypothyroidism encompasses a mild form of hypothyroidism where the only abnormal hormone level is an elevated TSH.[2] Whereas overt hypothyroidism is clear hypothyroidism described by an increased TSH and a declined T4 level.[2] The prevalence of overt hypothyroidism in the United States has dramatically increased over the past 2 decades and, as of 2019, has persisted to rise steadily, influencing around 30 million people aged 18 or older in the United States.[3] The mean age at diagnosis is 60 years, and the risk of developing the condition increases with age.[4] The incidence is four times higher in women than in men.[5] Hypothyroidism can be primary, which is distinguished by an abnormality in the thyroid gland, or secondary, which is due to a hypothalamic or pituitary abnormality.[6] In the United States, autoimmune thyroid disease, for example, Hashimoto thyroiditis, is the most popular aetiology of hypothyroidism. Still, around the world, iodine deficit in food is the

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most significant aetiology.[7]

The signs and symptoms of hypothyroidism can differ from an asymptomatic patient in whom hypothyroidism is only shown on routine blood work to myxedema coma, which is a complicated state of this disease. Classic signs and symptoms include cold intolerance, puffiness, decreased sweating, and skin changes, which can often be overlooked.[8] In neonates, hypothyroidism can result in problems of feeding, failure to grow, constipation, sleepiness, and, if untreated, mental retardation. Affected children may suffer from impairment of linear growth and bone maturation.[9] Diagnosis of hypothyroidism depends on history, physical examination, and laboratory tests.[10] Low serum T4 and elevated TSH levels are distinguishing features of primary hypothyroidism and should be done when Hashimoto's thyroiditis is suspected.[10]

Guidelines for the treatment of hypothyroidism presented by the American Thyroid Association found that levothyroxine should stay the typical therapy for treating hypothyroidism.[11] The guidelines provide no strong evidence for the superiority of alternative preparations, such as levothyroxine–liothyronine combination therapy, thyroid extract therapy, or others, over monotherapy with levothyroxine in enhancing health outcomes.[11] The efficacy of treatment is evaluated through monitoring of TSH and improvement in symptoms of hypothyroidism.[12] Due to the long half-life of T4 (7-10 days), symptom improvement often takes several weeks, and the TSH should be measured 6 to 8 weeks after initiation or a dosage change to determine the full impact of treatment.[12]

Lithium is an integral drug utilized in the management of acute mania, unipolar and bipolar depression and prophylaxis of bipolar disorders.[13] Thyroid malformations accompanied by treatment with lithium have been widely expressed in medical research to date, which involve goitre, hypothyroidism, hyperthyroidism and autoimmune thyroiditis.[13] Antiepileptic drugs (AEDs) are one of the contributing agents of drug-induced hypothyroidism.[14] Indeed, clinically important thyroid disorders are described to happen infrequently following AED use, including after phenytoin or gabapentin administration.[14]

A study conducted in the UK proposes that addressing knowledge and perception gaps between patients and professionals could decrease barriers to optimal treatment of hypothyroidism. In addition, engaging pharmacists and nurses is necessary to encourage perfect thyroid hormone replacement therapy.[15]

A cross-sectional study in Turkey found that physicians who encounter pregnant women often lack sufficient information on treating thyroid disorders and providing iodine support during pregnancy and lactation.[16] The rationale for conducting this research is the scarcity of research in Iraq that evaluates the general knowledge, attitude, and practice of doctors about hypothyroidism. The objective of this study is to assess the knowledge, attitudes, and practices of doctors about hypothyroidism in two hospitals at the Rusafa Health Directorate.

## METHODS

**Study design and setting**: A cross-sectional study was conducted at Al-Nu'man Teaching Hospital, Martyr Dhari Al-Fayad General Hospital, and Primary Healthcare Centers of the Al-Shaab Primary Healthcare Sector, Baghdad, Iraq, from the 1st of July, 2024, to the 1st of March, 2025. We included 86 doctors, 41 residents, 30 specialists (9 internists, 13 obstetricians and gynaecologists, and eight family physicians), and 15 general practitioners.

**Ethical consideration**: Preliminary approval was obtained from the administrators of Al-Nu'man Teaching Hospital, Martyr Dhari Al-Fayad General Hospital, and Primary Healthcare Centers of the Al-Shaab Primary Healthcare Sector. The Committee of Research Ethics in the Al-Russafa Health Directorate approved the protocol in accordance with the code of ethics in research adopted by the Ministry of Health in Iraq. The authors explained the study's objectives to all

participants before they completed the questionnaire, and we considered returning the completed questionnaire forms as an indication of agreement to participate.

**Definition of the enrollment criteria**: We included Internists, family physicians, obstetricians, and gynaecologists, as well as medical residents working at Al-Nu'man Teaching Hospital and Dhari Al-Fayad General Hospital. Additionally, general practitioners and family physicians working at Primary Healthcare Centres within the Al-Sha'ab Primary Healthcare Sector were targeted in this study. Doctors who refused to participate in the study were excluded.

**Sampling**: The selection of the primary healthcare centres from the Shaab sector and the selection of participants from the targeted population were done conveniently.

**Questionnaire design**: The researchers constructed a questionnaire based on a previous study, [17] with modifications made by medical research experts, including consultant family physicians and general surgeons, to make it suitable for Iraqi healthcare providers. We used an English language version of the questionnaire, which was piloted on 30 doctors, yielding a Cronbach's alpha of 0.78, which ensured reliability. The results of those 30 doctors were not included in the final analysis of this study. The questionnaire consisted of 35 questions covering the following topics: demographic characteristics (5 questions), knowledge section (20 questions), attitude section (4 questions), and practice section (6 questions).

The participants were asked to answer the 20 questions designed to measure the level of knowledge by 'yes', 'no' or 'I do not know'. The correct answer was given two points, 'I do not know' received one point, and the wrong answer received zero points. The final score would be ranged between zero and 40. Each participant's knowledge score was divided into three categories: poor when the score was <50 per cent, <20 points; fair when it was 50 per cent–75 per cent,20–30 points; and good when it was >75 per cent, > 30 points.

For attitude questions, participants were asked to choose one out of five answers based on the Likert scale. We gave 5 points for 'strongly agree', 4 for 'agree', 3 for 'neutral, 2 for ' disagree', and 1 for 'strongly disagree'. Those who scored less than 10 points (50%) were considered to have a negative attitude, 50-75% (10-15 points) were considered neutral, and those who scored more than 15 points were considered positive. For practise questions, we allocated 5 points for choosing "always", 4 for "often", 3 for "sometimes", 2 for "seldom", and 1 for "nev¬er The level of practice was categorized as "non-adequate" <15 points, borderline if got 15-23 points, and "adequate" > 23 points).

**Data collection**: The research was conducted from the 1st of July 2024 to the 1st of March 2025. Each respondent received an anonymous questionnaire from the researchers. Participants were informed about the study's objective through verbal interactions and in the form of brief descriptions written at the start of the questionnaire. There was no motivation or tension among the participants. Their identity was kept unknown, and the privacy of their responses was confirmed to them. The researcher collected the questionnaire forms from the participants on the spot, checked for completion, and encouraged them to respond to any unanswered items. We predefined that a questionnaire was valid for analysis only if 100% of the questions were answered. We distributed 102 questionnaire forms, 86 of which were deemed valid for analysis, resulting in a response rate of 84.3%.

**Outcomes**: Demographic characteristics of the respondents included age, education, experience in practice, and gender. Items related to knowledge, attitude and practice regarding hypothyroidism. Knowledge, attitude, and practice levels regarding hypothyroidism vary based on the participants' professions. All of these variables were measured using descriptive statistics and calculating the P value.

**Statistical analysis**: IBM SPSS statistics version

**Table 1** | Demographic features of the participants.

| Demosocial features | Resident | Internist | Ob. & Gyn | FP | GP | Total |
|---|---|---|---|---|---|---|
| | No (%) | No (%) | No (%) | No (%) | No (%) | No (%) |
| **Age** | | | | | | |
| **≤ 25 years** | 7(17.1) | 0(0.0) | 0(0.0) | 0(0.0) | 2(13.3) | 9(10.46) |
| **26–40 years** | 34(82.9) | 6(66.66) | 4(30.76) | 4(50.0) | 12(80.0) | 60(69.76) |
| **>40 years** | 0(0.0) | 3(33.33) | 8(37.86) | 4(50.0) | 1(6.7) | 16(18.60) |
| **Educational level** | | | | | | |
| **Bachelor** | 41(100.0) | 0(0.0) | 0(0.0) | 0(0.0) | 15(100.0) | 56(65.11) |
| **Higher Diploma** | 0(0.0) | 0(0.0) | 7(53.84) | 1(12.5) | 0(0.0) | 8(9.30) |
| **Board** | 0(0.0) | 9(100.0) | 6(46.15) | 7(87.5) | 0(0.0) | 22(25.58) |
| **Experience in practice** | | | | | | |
| **≤5 years** | 29(70.7) | 0(0.0) | 0(0.0) | 0(0.0) | 6(40.0) | 35(40.69) |
| **6–10 years** | 11(26.8) | 3(33.33) | 3(23.07) | 3 (37.5) | 6(40.0) | 26(30.23) |
| **11–20 years** | 1(2.4) | 4(44.44) | 5(38.46) | 5(62.5) | 3(20.0) | 18(20.93) |
| **>20 years** | 0(0.0) | 2(22.22) | 5(38.46) | 0(0.0) | 0(0.0) | 7(8.13) |
| **Gender** | | | | | | |
| **Male** | 10(24.4) | 9(100.0) | 0(0.0) | 2(16.7) | 5(33.3) | 26(30.23) |
| **Female** | 31(75.6) | 0(0.0) | 13(100.0) | 6(83.3) | 10(66.7) | 60(69.76) |
| **Total** | 41(47.67) | 9(10.46) | 13(15.11) | 8(9.30) | 15(17.44) | 86(100.0) |

23 and Microsoft Excel 2010 were used to analyze the data. The chi-square test was used to investigate the association among demographics. A p-value less than 0.05 was considered significant.

## RESULTS

**Characteristics of respondents**: Table 1 provides information about the characteristics of respondents, including age, education, experience in practice, and gender. It shows that residents were 41(47.67%), internists, obstetricians and gynaecologists and family physicians, 9(10.46%), 13(15.11%), and 8(9.30%),respectively. and general practitioners were 15(17.44%). Females comprised the majority of respondents at 60 (69.76%), with males making up 26 (30.23%). The mean age of respondents was (35.255±9.043) years, and most participants fell within the 26-40 years age group, accounting for 60(69.76%) of the sample. The largest proportion of respondents had 5 years or less of professional experience, representing 35(40.69%). The most common fields among specialists were obstetricians and gynaecologists, with 13 (15.11%), followed by internists at 9 (10.46%), and family physicians at 8 (9.30%).

**Respondents' knowledge about hypothyroidism**: Table 2 shows that 85 (98.83%) of participants knew that the thyroid gland is a butterfly-shaped gland located in the neck and that thyroid hormones are essential for normal metabolic function. On the other hand, only 34(39.53%) of doctors knew that amiodarone may increase the risk of developing hypothyroidism. All differences between doctors were statistically non-significant except for question 7, with a P value =0.040.

**Respondents' attitudes about hypothyroidism**: Table 3 shows respondents' frequency and percentage of attitudes answers regarding hypothyroidism. The highest positive attitude was shown regarding the importance of screening for hypothyroidism among people with relatives or family members diagnosed with the disease, with a total of 73 (84.88%) participants demonstrating a positive attitude. Specifically, 40 (46.51%) participants strongly agreed, and 33 (38.37%) participants agreed with this statement. While the lowest positive attitude was observed concerning the significance of frequent testing for hypothyroidism among people above the age of 35 years, with a total of 43 (50.00%) participants demonstrating a positive attitude. Specifically, 21 (24.41%) participants strongly agreed, and 22 (25.58%) participants agreed with this statement.

**Table 2** | Frequency of correct responses about hypothyroidism knowledge among doctors.

| | Answers | Correct Answer | Resident No (%) | Internist No (%) | Ob. & Gyn No (%) | FP No (%) | GP No (%) | Total No (%) | P value |
|---|---|---|---|---|---|---|---|---|---|
| 1 | The thyroid gland is a butterfly-shaped gland located in the neck. | Yes | 40 (97.6) | 9 (100) | 13 (100) | 8 (100) | 15 (100) | 85 (98.8) | 0.893 |
| 2 | Thyroid hormones are essential for normal metabolic function. | Yes | 39 (95.1) | 9 (100) | 13 (100) | 8 (100) | 14 (93.3) | 83 (96.5) | 0.538 |
| 3 | Hypothyroidism is a medical condition due to low thyroid hormone level. | Yes | 40 (97.6) | 9 (100) | 12 (92.3) | 8 (100) | 15 (100) | 78 (97.5) | 0.562 |
| 4 | Iodine deficiency in the diet may lead to hypothyroidism. | Yes | 34 (82.9) | 9 (100) | 10 (76.9) | 8 (100) | 13 (86.7) | 74 (86.04) | 0.577 |
| 5 | Hypothyroidism is not related to increase TSH levels. | No | 25 (60.97) | 8 (88.8) | 7 (53.8) | 5 (62.5) | 6 (40) | 51 (59.3) | 0.347 |
| 6 | Subclinical hypothyroidism is present when TSH is raised but free T4 is normal. | Yes | 29 (70.7) | 4 (44.4) | 7 (53.8) | 7 (87.5) | 12 (80) | 59 (68.6) | 0.334 |
| 7 | The vast majority of patients have primary hypothyroidism due to Hashimoto disease. | Yes | 31 (75.6) | 4 (44.4) | 4 (30.76) | 6 (75.0) | 8 (53.3) | 53 (61.6) | 0.040 |
| 8 | Amiodarone may increase the risk of developing hypothyroidism. | Yes | 17 (41.5) | 4 (44.4) | 3 (23.1) | 4 (50.0) | 6 (40) | 34 (39.5) | 0.141 |
| 9 | Thyroid disorders do not run in the family. | No | 22 (53.7) | 6 (66.6) | 9 (69.2) | 6 (75.0) | 5 (33.3) | 47 (58.8) | 0.334 |
| 10 | Patients with swelling or abnormality in the neck may be suffering from hypothyroidism. | Yes | 26 (63.4) | 8 (88.8) | 8 (61.5) | 7 (87.5) | 10 (66.7) | 59 (68.6) | 0.696 |
| 11 | Hypothyroidism does not occur in pregnancy. | No | 34 (82.9) | 8 (88.8) | 9 (69.2) | 7 (87.5) | 7 (46.7) | 65 (75.58) | 0.134 |
| 12 | Hypothyroidism may cause dry skin. | Yes | 34 (82.9) | 5 (55.55) | 9 (69.2) | 7 (87.5) | 12 (80) | 67 (77.9) | 0.498 |
| 13 | Patients with hypothyroidism may be at an increased risk of having depression. | Yes | 34 (82.9) | 9 (100) | 11 (84.6) | 6 (75.0) | 12 (80) | 72 (83.7) | 0.311 |
| 14 | Hypothyroidism may cause muscle aches/ pain. | Yes | 28 (68.3) | 5 (55.5) | 11 (84.6) | 6 (75.0) | 12 (80) | 58 (72.5) | 0.614 |
| 15 | Hypothyroidism may cause weight loss. | No | 31 (75.6) | 8 (88.8) | 8 (61.5) | 5 (62.5) | 8 (53.3) | 60 (69.7) | 0.703 |
| 16 | Hypothyroidism may cause fatigue. | Yes | 32 (78.0) | 8 (88.8) | 10 (79.9) | 8 (100) | 13 (86.7) | 71 (82.5) | 0.661 |
| 17 | Patient with hypothyroidism might have more risk of having increased cholesterol levels . | Yes | 24 (58.5) | 6 (66.6) | 10 (76.9) | 8 (100) | 10 (66.7) | 58 (67.4) | 0.565 |
| 18 | Myxedema coma is a rare complication of decompensated hypothyroidism. | Yes | 32 (78.0) | 7 (77.7) | 8 (61.5) | 7 (87.5) | 9 (60) | 63 (73.25) | 0.383 |
| 19 | Hypothyroidism is diagnosed screened ? by measuring TSH levels in the blood. | Yes | 34 (82.9) | 6 (66.6) | 9 (69.2) | 7 (87.5) | 11 (73.3) | 67 (77.9) | 0.881 |
| 20 | Levothyroxine is the drug of choice for thyroid hormone replacement. | Yes | 35 (85.4) | 8 (88.8) | 11 (84.6) | 8 (100) | 12 (80) | 74 (86.04) | 0.172 |

**Responents' practice about hypothyroidism:** The highest positive practice was reported in advising patients not to miss any doses of levothyroxine, with a total of 80 (93.01%). The least positive practice of the doctors was advising patients not to take levothyroxine with any other medication, with a total of 49 (56.97%). Specifically, 31(36.04%) participants strongly agreed and 18(20.93%) participants agreed with this statement. See Table 4.

**Knowledge, attitude, and practice about hypothyroidism distributed according to the demographics**: Related to the factors that impact the level of knowledge about hypothyroidism, the results presented in Table 5 revealed that 45 (80.35%) of respondents aged 26–40 years were more likely to have good knowledge (P = 0.001). While profession, education, experience in practice and gender did not have any statistically significant association with the level of knowledge about hypothyroidism. Concerning the attitude of doctors towards hypothyroidism, the results showed that profession, age, education, experience in practice and gender did not have any statistically significant association with the level of attitude about hypothyroidism. Concerning the practice of doctors towards

**Table 3** | Frequency of answers to attitude questions about hypothyroidism.

| Attitudes questions | Strongly Agree | Agree | Neutral | Disagree | Strongly Disagree | Total |
|---|---|---|---|---|---|---|
| | N (%) | N (%) | N (%) | N (%) | N (%) | N (%) |
| Relatives of a patient with hypothyroidism should be tested for hypothyroidism | 40(46.51) | 33(38.37) | 3(3.48) | 7(8.13) | 3(3.48) | 86 (100.0) |
| Pregnant women should be tested for hypothyroidism | 37(43.02) | 29(33.72) | 8(9.30) | 9(10.46) | 3(3.48) | 86(100.0) |
| People above the age of 35 years should be tested frequently for hypothyroidism | 21(24.41) | 22(25.58) | 17(19.76) | 17(19.76) | 9(10.46) | 86(100.0) |
| Women should be tested at regular intervals for hypothyroidism | 42(48.83) | 24(27.90) | 12(13.95) | 4(4.65) | 4(4.65) | 86(100.0) |

**Table 4** | Frequency of answers to practice questions about hypothyroidism.

| Attitudes questions | Always | Often | Sometimes | Seldom | Never | Total |
|---|---|---|---|---|---|---|
| | N (%) | N (%) | N (%) | N (%) | N (%) | N (%) |
| Do you advise the patient to take levothyroxine daily? | 55(63.95) | 19(22.09) | 6(6.97) | 1(1.16) | 4(4.65) | 86(100.0) |
| Do you advise the patient to get his/her TSH level tested regularly? | 67(77.90) | 12(13.95) | 7(8.13) | 0(0.0) | 0(0.0) | 86(100.0) |
| Do you advise the patient not to take levothyroxine with any other medications? | 31(36.04) | 18(20.93) | 20(23.25) | 6(6.97) | 11(12.79) | 86(100.0) |
| Do you advise the patient to take levothyroxine 30–60 minutes before breakfast on an empty stomach? | 57(66.27) | 22(25.58) | 2(2.32) | 3(3.48) | 2(2.32) | 86(100.0) |
| Do you advise the patient not to miss any doses of levothyroxine? | 64(74.41) | 16 (18.60) | 3(3.48) | 1(1.25) | 2(2.32) | 86(100.0) |
| Do you give the patient more information/counseling on how to manage hypothyroidism? | 61(70.93) | 16 (18.60) | 6(6.97) | 2(2.32) | 1(1.25) | 86(100.0) |

hypothyroidism, the results showed that a significantly higher proportion of knowledge scores were exhibited by bachelor's degree holders, where 49(67.12%) of respondents who held bachelor's degree had good knowledge about hypothyroidism (P=0.014). While profession, experience in practice, age and gender did not have any statistically significant association with the level of knowledge about hypothyroidism.

## DISCUSSION

The overall knowledge of doctors in the study was 56 (65.11%), indicating a mostly good level of knowledge across different specialities. Among respondents aged 26–40 years, 45 individuals (80.35%) were more likely to have good knowledge (P=0.001).This is because early career doctors may be more focused on clinical and educational work.[18] Concerning overall attitude, the data shows that 51 (59.30%) of doctors had a positive attitude. Regarding overall practice, the study showed that out of 86 doctors, 73 (84.88%) exhibited adequate practices in managing hypothyroidism. These results suggest high adherence to recommended practices. 49 (67.12%) of doctors who held a bachelor's degree had adequate practice. This is because Colleges and universities for centuries have had mission statements that varying degrees consist of educating students, training professionals, engaging in scholarship and research, promoting creative activity, improving healthcare, and providing public service, and undergraduate education refers to the process of actively supporting students with intellectually challenging resources, diverse learning environments, and opportunities for critical thinking to enhance their information literacy skills.[19] Evidence suggests that there is an inverse relationship between the number of years that a physician has been in practice and the quality of care that the physician provides.[20]

In our study, we found that obstetricians

**Table 5** | Knowledge, attitude, and practice about hypothyroidism distributed according to the demographics.

| Demosocial Features | Total | Knowlegde | | | Attitude | | | Practice | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Poor | Fair | Good | Negative | Neutral | Positive | Indequate | BorderLine | Adequate |
| | No. (%) | No. (%) | No. (%) | No. (%) | No. (%) | No. (%) | No. (%) | No. (%) | No. (%) | No. (%) |
| **Profession** | | | | | | | | | | |
| **Resident** | 41 (47.67) | 0 (0.0) | 14 (46.66) | 27 (48.2) | 4 (100) | 15 (48.38) | 22 (43.13) | 0 (0.0) | 5 (38.46) | 36 (49.31) |
| **Internists** | 9 (10.46) | 0 (0.0) | 1 (3.33) | 8 (14.28) | 0 (0.0) | 5 (16.12) | 4 (7.84) | 0 (0.0) | 2 (15.38) | 7 (9.58) |
| **OB & GYN** | 13 (15.11) | 0 (0.0) | 6 (20.0) | 7 (12.7) | 0 (0.0) | 5 (16.12) | 8 (15.68) | 0 (0.0) | 4 (30.76) | 9 (12.32) |
| **FP** | 8 (9.30) | 0 (0.0) | 2 (6.66) | 6 (10.7) | 0 (0.0) | 2 (6.45) | 6 (11.76) | 0 (0.0) | 0 (0.0) | 8 (10.95) |
| **GP** | 15 (17.44) | 0 (0.0) | 7 (23.33) | 8 (14.28) | 0 (0.0) | 4 (12.90) | 11 (21.56) | 0 (0.0) | 2 (15.38) | 13 (17.80) |
| P value | | 0.375 | | | 0.494 | | | | 0.334 | |
| **Age** | | | | | | | | | | |
| **≤25 yrs.** | 9 (10.46) | 0 (0.0) | 8 (26.66) | 1 (1.78) | 0 (0.0) | 2 (6.45) | 7 (13.72) | 0 (0.0) | 3 (23.07) | 6 (8.21) |
| **26–40 yrs.** | 61 (70.93) | 0 (0.0) | 16 (53.33) | 45 (80.35) | 4 (100) | 24 (77.41) | 33 (64.70) | 0 (0.0) | 7 (53.84) | 54 (73.97) |
| **>40 yrs.** | 16 (18.04) | 0 (0.0) | 6 (20.0) | 10 (17.85) | 0 (0.0) | 5 (16.12) | 11 (21.56) | 0 (0.0) | 3 (23.07) | 13 (17.80) |
| P value | | 0.001 | | | 0.487 | | | 0.21 | | |
| **Education** | | | | | | | | | | |
| **Bachelor only** | 56 (65.11) | 0 (0.0) | 21 (70.0) | 35 (62.5) | 4 (100) | 19 (61.29) | 33 (64.70) | 0 (0.0) | 7 (53.84) | 49 (67.12) |
| **H. D.** | 8 (9.30) | 0 (0.0) | 3 (10.0) | 5 (8.92) | 0 (0.0) | 4 (12.90) | 4 (7.84) | 0 (0.0) | 4 (30.76) | 4 (5.47) |
| **Board** | 22 (25.58) | 0 (0.0) | 6 (20.0) | 16 (28.57) | 0 (0.0) | 8 (25.80) | 14 (27.45) | 0 (0.0) | 2 (7.69) | 20 (27.39) |
| P value | | 0.686 | | | 0.586 | | | 0.014 | | |
| **Experience in practice** | | | | | | | | | | |
| **≤5 yrs.** | 35 (40.69) | 0 (0.0) | 15 (50.0) | 20 (35.71) | 3 (75.0) | 12 (40.0) | 20 (43.47) | 0 (0.0) | 5 (38.46) | 30 (41.09) |
| **6–10 yrs.** | 26 (30.23) | 0 (0.0) | 7 (23.33) | 19 (33.92) | 1 (25.0) | 10 (30.0) | 15 (32.6) | 0 (0.0) | 3 (23.07) | 23 (31.50) |
| **11–20 yrs.** | 18 (20.93) | 0 (0.0) | 6 (20.0) | 12 (21.42) | 0 (0.0) | 7 (23.33) | 11 (15.21.) | 0 (0.0) | 3 (23.07) | 15 (20.54) |
| **>20 yrs.** | 7 (8.13) | 0 (0.0) | 2 (6.66) | 5 (8.92) | 0 (0.0) | 2 (6.66) | 5 (8.69.) | 0(0.0) | 2 (15.38) | 5 (6.84) |
| P value | | 0.605 | | | 0.834 | | | 0.729 | | |
| **Gender** | | | | | | | | | | |
| **Male** | 26 (30.23) | 0 (0.0) | 10 (33.33) | 16 (28.57) | 0 (0.0) | 12 (38.70) | 14 (27.45) | 0 (0.0) | 6 (46.15) | 20 (27.39) |
| **Female** | 60 (69.76) | 0 (0.0) | 20 (66.66) | 40 (71.42) | 4 (100) | 19 (61.29) | 37 (72.54) | 0 (0.0) | 7 (53.84) | 53 (75.60) |
| P value | | 0.647 | | | 0.22 | | | 0.175 | | |
| **Total** | 86 (100) | 0 (0.0) | 30 (34.88) | 56 (65.11) | 4 (4.65) | 31 (36.04) | 51 (59.30) | 0 (0.0) | 13 (15.11) | 73 (84.88) |

and gynaecologists had a borderline practice. Similar to our findings, a survey on diagnosing and managing thyroid disorders during pregnancy among obstetrician-gynaecologists demonstrated that thyroid disorders are commonly treated by obstetrician-gynaecologists, and in general, their practices for diagnosis and management conform to fair practices.[21] Additionally, a web-based survey assessing the knowledge of primary care physicians in the Madrid community about hypothyroidism revealed that primary care physicians had a good understanding of hypothyroidism, which is consistent with our findings.[22] In our study, we found that knowledge of GPs is generally fair.

In our study, we concluded that GPs had a fair level of knowledge regarding hypothyroidism. In contrast to our findings, a study to assess knowledge of thyroid disorders during pregnancy among general practitioners in Iran revealed that GPs attending pregnant women in Iran had poor knowledge of the pathophysiology, diagnosis, and management of thyroid disorders during pregnancy.[23] In our study, we found that FP had a good knowledge regarding hypothyroidism. In contrast to ours, a study conducted in Sanliurfa central districts in Tyrkey revealed that family physicians do not have adequate knowledge about the use of levothyroxine for treating hypothyroidism, and they need effective training on this vital issue.[24] Our study found that GPs have adequate practice regarding hypothyroidism. In contrast to our study, a study assessing practices of thyroid diseases during pregnancy among endocrinologists, internists, and general Practitioners revealed that GPs have inadequate practices.[25]

Unfortunately, only 34(39.53%) of doctors knew that amiodarone may increase the risk of developing hypothyroidism. Amiodarone is a highly effective and well-established

antiarrhythmic drug.[26] Amiodarone can lead to both hypothyroidism (amiodarone-induced hypothyroidism) and, less commonly, hyperthyroidism (amiodarone-induced thyrotoxicosis) and relates to high iodine content within the molecule as well as to several unique intrinsic properties of amiodarone.[26]

We found that four internists (44.44%) and four obstetricians and gynaecologists (30.76%) think that the vast majority of patients have primary hypothyroidism due to Hashimoto's disease. Primary hypothyroidism is associated with decreased thyroid hormone and increased TSH levels.[27] These abnormal levels may result from treatment for hyperthyroidism, iodine deficiency, thyroid cancer, or autoimmune disorders such as Hashimoto's thyroiditis (HT).[27] Seven GPs (46.7%) knew that hypothyroidism occurs in pregnancy. The prevalence of hypothyroidism during pregnancy is estimated to be 0.3–0.5% for overt hypothyroidism and 2–3% for subclinical hypothyroidism, and autoimmune thyroiditis is the most common cause of hypothyroidism during pregnancy.[28]

Four internists (44.44%) think that Subclinical hypothyroidism is present when TSH is raised, with a normal level of free T4. During a routine screening for thyroid disease, a patient may be found to have subclinical hypothyroidism —an elevated TSH level in conjunction with a free T4 level that is not below normal and is also referred to as mild thyroid failure.[29]

A cross-sectional observational study conducted at Al Hassan Metabolism, Endocrine, and Diabetes Center (HMEDC) in Iraq between September 2022 and March 2023 concluded that the prevalence of primary hypothyroidism was higher among women who were overweight, experienced substantial depressive symptoms, and faced challenging life circumstances as compared to males.[30] A study by Zaman et al. (2021) in Duhok City reported a high prevalence of elevated TSH levels, with a greater occurrence in females compared to males. The research also found that thyroid disorders varied across different age groups, with subclinical hypothyroidism being the most prevalent among them.[31] The study concluded that middle-aged and older individuals, especially females, are more susceptible to thyroid disorders[31]. Mansour AA and colleagues conducted a retrospective analysis of thyroid disease patterns in Basrah, Iraq, in which they found that the incidence of hypothyroidism was double that of hyperthyroidism in the population studied.[32] This finding highlights the need for greater awareness and management strategies for hypothyroidism in this region.[32]

## CONCLUSION

Our study concluded that doctors had overall good knowledge, a positive attitude, and adequate practice regarding hypothyroidism.

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**Abbreviations list**: Antiepileptic drugs (AEDs), Family physicians (FP), General Practitionars (GPs), Statistical Package for Social Sciences (SPSS), Thyroid Stimulating Hormone (TSH), Thyroxine (T4).

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