

## ASSESSMENT OF KNOWLEDGE, ATTITUDE, AND PRACTICE REGARDING HYPOTHYROIDISM AMONG INFERTILE WOMEN WITH HYPOTHYROIDISM

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### ABSTRACT

**Objective:** The study was designed to assess the knowledge, attitude, and practice (KAP) of hypothyroidism among infertile women with hypothyroidism.

**Methods:** A cross-sectional analysis was performed in an outpatient environment of infertility centers. We used a validated questionnaire to assess hypothyroidism KAP. Using frequency counts (n) and percentages (%), discrete data were summarized. The Chi-square/Fisher test was used between groups to compare.

**Results:** The mean age of participants was found to be 32±5.77 years. It was found that 72% of the subjects had poor knowledge, 44% were extremely concerned, and 81% were practicing with a moderate level of precaution. Among the consequences of hypothyroidism, 68% of the study subjects most properly-recognized menstrual disturbance, followed by 66%, 51%, and 48% of study subject properly-recognized weight gain, fatigue, and muscle aches/pain as a clinical manifestation of hypothyroidism. Most patients (98%) adhered to their medications. Nearly half of the study patients (45%) did not avoid cabbage, cauliflower, or soya.

**Conclusion:** Our study highlighted the significance of investing appropriate time to provide patients with a comprehensive education to bridge the gaps in patient care. The findings also indicated that it be better for the understanding of the patients if health-care providers could provide patients with data sheets explaining the disease or having some pictorial/pamphlets about the disease's reality and myths.

**Keywords:** Hypothyroidism, Knowledge, Attitude, Practice, Patient education.

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### INTRODUCTION

Hypothyroidism is still the most commonly diagnosed endocrine disorder in India, with a prevalence of 3.9-10.95% [1]. It occurs mainly in women of 21-40 years age [2]. Thyroid disease varies by geographic location, environmental factors, major radio nuclear activities, factors affecting the incidence and duration of iodine deficiency, the excess dietary iodine, and the population studied [3]. Hypothyroidism is among the severest disorders characterized by a broad medical continuum ranging from open myxedema, end-organ symptoms, and multisystem failure to an asymptomatic or subclinical disorder with normal thyroxine and triiodothyronine levels and slightly elevated serum thyrotropin levels [4-6]. Adding more a low-functioning thyroid gland is prevalent in females, resulting in a significant percentage of infertility, repeated miscarriages, preterm delivery, placenta previa, irregular menstrual cycles, and unexplained weight loss or gain [7,8]. The majority of infertile women have hypothyroidism and hyperprolactinemia that may correlate with infertility [9]. Research shows that hypothyroidism may contribute to the morbidity of osteoporosis, hyperlipidemia, hypercholesterolemia, cardiac disease, asthma, and neuropsychiatric disorder [10]. The general knowledge of hypothyroidism in India has been recognized as weak and in a significant proportion of patients is associated with inadequate knowledge, misconceptions, and practices [11]. The lacunae found in hypothyroid patients regarding information and procedures resulted in a number of misunderstandings, inadequate adherence, and suboptimal management [11,12]. One of several important factors that contribute to this observed gap is the lack of qualified doctors to treat hypothyroidism. Another contributing factor is the inadequate amount of time doctors spend on patient education. Many kinds of research were conducted to assess the patient's knowledge regarding hypothyroidism among the general hypothyroid population. This

research aims to analyze the knowledge gaps, faulty practices, and myths of hypothyroidism, especially in a subpopulation called infertile women with hypothyroidism because this subpopulation should be more concerned about hypothyroidism for the success of infertility treatment.

### METHODS

The research was performed over a span of 6 months in a private hospital. It obtained ethical clearance from the Institutional Ethical Committee for the study. Infertile female patients of fertility age with hypothyroidism were chosen for analysis. Patients who underwent thyroid surgery and radio ablation therapy were excluded from the study.

- A separate questionnaire was prepared to record patient details such as name, age, sex, educational status, family history, medical history, and prescribed drugs. It also included questions for assessing their hypothyroidism knowledge, attitude, and practice (KAP)
- After obtaining an informed consent form from the patient, the demographic data such as age, gender, educational status, diagnosis, and prescriptions were collected along with answers for KAP regarding hypothyroidism
- The questionnaires from 120 patients for their KAP of hypothyroidism were collected, evaluated, and scored
- The rating evaluations of the three KAP domains were performed as follows:
  1. For the sake of knowledge, each correct answer ("Yes" for positive statements and "No" for negative statements) was given 1 point and an incorrect response ("No" for positive statements and "Yes" for negative statements) was given 0 points including "Don't know." Based on the overall score, the knowledge level

was graded as “low” (nearly 12 points), normal (13–15 points), or “high” (nearly 16 points)

- For attitude, the level of concern was classified as “extremely concerned” (if the agreement was marked for all five statements [points 4 or 5 on the Likert scale]), “quite concerned” (if the agreement was shown for 3–4 statements), “little concern” (if the agreement was marked for 1–2 statements), and “not concerned” (no agreement)

**Table 1: Demographic data of participants (n=120)**

Variables/characteristics	Frequency, n (%)
Age group	
20–25	18 (15)
25–30	22 (18)
30–35	34 (28)
35–40	34 (28)
40–45	12 (10)
Education level	
School	46 (38)
Diploma	8 (6)
Undergraduate	36 (30)
Postgraduate	30 (25)

n: Total number of patients available with the data

- For practice, each of the patient’s precautionary statements (total score ranged between 0 and 8 points) 1 point was given. For a score of 7 points, a “high level” of precaution was considered, a moderate level “was given when the score was between 4 and 6 points and a poor level” with scores <3.
- Discrete data are summarized using the frequency counts (n) and (percentage). All statistical analysis was carried out using a two-sided experiment with a meaning level of 0.05. The Chi-square/Fisher test was used for comparison between groups.

## RESULTS

It was observed that the mean age of respondents was 32±5.77 years. From table 1 it was observed that most patients were not graduates (38%) followed by undergraduates (30%) and postgraduates (25%).

### Knowledge about hypothyroidism

Table 2 summarizes the responses given to all individual questions of the knowledge domain. A good number of patients (43%) understood the structure of the thyroid gland correctly. Among the consequences of hypothyroidism, 68% of the study subject most properly-recognized menstrual disturbance, 66% weight gain, 51% fatigue, and 48% muscle ache as a clinical symptom of hypothyroidism. Only 16% correctly identified cold intolerance and 31% constipation as manifestations of

**Table 2: Responses to knowledge-based questions regarding hypothyroidism**

Questions	Patient response (n=120)		
	Yes, n (%)	No, n (%)	Do not know, n (%)
Thyroid gland is a butterfly-shaped gland, located in the neck	52 (43)	2 (01)	66 (55)
Hypothyroidism is a medical condition due to low-thyroid hormone levels	60 (50)	00 (00)	60 (50)
Hypothyroidism is not related to increased TSH levels	26 (21)	24 (20)	70 (58)
Hypothyroidism may cause cold intolerance	20 (16)	12 (10)	88 (73)
Hypothyroidism may cause dry skin	32 (26)	10 (08)	78 (65)
Hypothyroidism may cause fatigue	62 (51)	6 (05)	52 (43)
Hypothyroidism may cause muscle aches/pain	58 (48)	8 (06)	54 (45)
Hypothyroidism may cause constipation	38 (31)	14 (11)	68 (56)
Hypothyroidism may cause weight gain	80 (66)	4 (3)	36 (30)
Hypothyroidism may cause abnormal menstruation	82 (68)	4 (3)	34 (28)
Iodine deficiency in diet may lead to hypothyroidism	36 (30)	4 (03)	80 (66)
Patients with hypothyroidism may be at an increased risk of having depression	38 (31)	8 (06)	74 (61)
Patients with hypothyroidism might have more risk of having increased cholesterol levels	44 (36)	12 (10)	64 (53)
Thyroid disorders run in families	66 (55)	8 (06)	46 (38)
Patients with swelling or abnormality in the neck may be suffering from hypothyroidism	56 (46)	6 (05)	48 (40)
Certain medications may increase the risk of developing hypothyroidism	18 (15)	12 (10)	90 (40)
Hypothyroidism does not occur in pregnancy	20 (16)	26 (21)	74 (61)
Hypothyroidism is diagnosed by measuring TSH levels in blood	52 (23)	4 (03)	64 (53)
Hypothyroidism is treatable	40 (33)	20 (16)	60 (50)
Alternative forms of medicine, such as Ayurveda and Homeopathy, may be useful to treat hypothyroidism	20 (16)	12 (10)	88 (73)

n: Total number of patients available with the data. TSH: Thyroid-stimulating hormone

**Table 3: Evaluation of association of different levels of knowledge with age group and educational qualification**

Parameter	Different levels of the knowledge domain (n= 120) n (%)			p-value
	Low level (≤12 points)	Moderate level (13–15 points)	High level (≥16 points)	
<b>Age in years</b>				
20–25	18 (15)	00 (00)	00 (00)	<0.0001
25–30	14 (11)	8 (6)	00 (00)	
30–35	28 (23)	12 (10)	6 (5)	
35–40	16 (13)	00 (00)	6 (5)	
40–45	12 (10)	00 (00)	00 (00)	
<b>Educational qualification</b>				
Others	40 (33)	4 (3)	2 (1)	0.099
Diploma	4 (03)	2 (1)	2 (1)	
Undergraduate	22 (18)	8 (6)	6 (5)	
Postgraduate	22 (18)	6 (5)	2 (1)	

Chi-square test was used at a 5% level of significance to evaluate the association of different levels of knowledge with age group and educational qualification. n: Total number of patients available with the data

Table 4: Responses to attitude-based questions

Questions	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Women are at a greater risk of developing hypothyroidism and should be tested at regular intervals for hypothyroidism	20 (16)	60 (50)	40 (33)	00 (00)	00 (00)
People above the age of 35 years should be tested frequently for hypothyroidism	18 (15)	46 (38)	56 (46)	00 (00)	00 (00)
Pregnant women should be tested for hypothyroidism	30 (25)	48 (40)	42 (35)	00 (00)	00 (00)
People with relatives/family members diagnosed with hypothyroidism should be tested for hypothyroidism	18 (15)	52 (43)	50 (41)	00 (00)	00 (00)
Treatment for hypothyroidism should be initiated after consultation with a physician only	36 (30)	32 (26)	52 (43)	00 (00)	00 (00)

n: 120; n: Total number of patients available with the data, n (%)

Table 5: Evaluation of association of different levels of attitude with age groups and educational qualification

Parameter	Different levels of attitude domain (n=120) n (%)				P-value
	Extremely concerned (5 points)	Quite concerned (3-4 points)	Little concerned (1-2 points)	Not concerned (0 points)	
<b>Age in years</b>					
20-25	2 (01)	10 (08)	00 (00)	6 (05)	0.0011
25-30	6 (05)	8 (6)	00 (00)	8 (6)	
30-35	10 (08)	8 (6)	6 (05)	10 (8)	
35-40	20 (16)	6 (5)	00 (00)	8 (6)	
40-45	6 (5)	4 (3)	00 (00)	2 (1)	
<b>Educational qualification</b>					
Diploma	6 (5)	00 (00)	00 (00)	2 (01)	<0.0001
Undergraduate	24 (20)	8 (6)	00 (00)	4 (3)	
Postgraduate	6 (5)	16 (13)	2 (01)	6 (5)	
Others	8 (6)	12 (10)	4 (3)	22 (18)	

Chi-square test was used at a 5% level of significance for the evaluation of the association of different levels of attitude with age groups and educational qualification.

n: Total number of patients available with the data

hypothyroidism. Swelling in the neck associated with hypothyroidism was correctly identified by 46% of patients. Approximately 77% did not know about the increased risk of hypothyroidism at the time of pregnancy and 44% of patients were not aware of the possibility that thyroid disorders could become inherited. A large number of patients had inaccurate knowledge of hypercholesterolemia (63.6%) and hypothyroid-causing drugs (50%). Most patients (56%) were not aware that hypothyroidism could be diagnosed by testing thyroid-stimulating hormone (TSH), but 21% and 50% of patients had no knowledge about the increased levels of TSH and low thyroid hormone levels in hypothyroidism, respectively. In addition, 70% of patients had incorrect knowledge that hypothyroidism may result from iodine deficiency. Just 16% were sure that alternative therapies were not effective in the management of hypothyroidism. Although 50-70% of participants had a clear awareness of tiredness, obesity, and muscle aches as the related hypothyroidism symptoms, the rest of the participants had no knowledge of any other symptoms associated with hypothyroidism. Over 50% of the participants were unaware of the genetic predisposition associated with hypothyroidism, which may be the reason for almost 41% of patients not being aware of having their family members tested for the illness. It is clear from Table 3 that knowledge has no dependency on either age or the educational qualification with statistical evidence.

#### Attitude

The responses to the attitude based questions are summarized in Table 4. Most subjects (44%) were extremely concerned about hypothyroidism. Highest agreement (66%) was found for the statement, "Women are at a greater risk of developing hypothyroidism and should be tested at regular intervals for hypothyroidism." However, 46% did not agree that people above the age of 35 years should be tested frequently for hypothyroidism. Overall scores from Table 5 showed that there is no dependency on the attitude with respect to either age or the educational qualification statistically.

#### Practice

The practices for hypothyroidism by the subjects are evaluated with the questions, as mentioned in Table 6. Most patients (98%) adhered to their

Table 6: Response to practice questions

Questions	Yes n (%)	No n (%)
Do you take your medication for hypothyroidism daily?	118 (98)	02 (01)
Do you miss any doses of your medication for hypothyroidism?	82 (68)	38 (31)
Do you take your medication 3060 min before breakfast on empty stomach?	112 (93)	08 (06)
Do you take your thyroid medicine with any other medicines?	72 (60)	48 (40)
As advised by your physician, do you get your TSH level tested regularly?	70 (58)	50 (41)
Do you look for information on hypothyroidism on the internet/ smartphone?	14 (11)	106 (88)
Did you ask your doctor for more information/counseling on how to manage hypothyroidism?	20 (16)	100 (83)
Do you avoid eating cabbage, cauliflower, and soya?	66 (55)	54 (45)

n: 120; n: Total number of patients available with the data. TSH: Thyroid-stimulating hormone

medications. However, 68% responded saying that they occasionally skip medications. About 58% of patients regularly tested TSH levels. About 60% said they had taken other medicines with hypothyroid medicines. A considerable number of patients (88%) did neither look for information from online sources, nor did they (83%) seek additional information from their doctors. Nearly half of the study patients (45%) did not avoid cabbage, cauliflower, or soya. According to Table 7, there is no statistical evidence for the association of knowledge with either age or educational qualification.

#### DISCUSSION

In nearly three-fourth (72%) of a treatment-experienced hypothyroid population, this KAP study identified a low level of understanding. Similar

Table 7: Evaluation of association of different levels of practice with age groups and educational qualification

Parameter	Different levels of practice domain (n=120) n (%)			p-value
	High level of precaution (≥ 7 points)	Moderate level of precaution (3-6 points)	Poor level of precaution (<3 points)	
<b>Age in years</b>				
20-25	2 (1)	16 (13)	00 (00)	0.51
25-30	2 (1)	18 (15)	2 (1)	
30-35	6 (5)	24 (20)	4 (8)	
35-40	4 (3)	28 (23)	2 (1)	
40-45	00 (00)	12 (10)	00 (00)	
<b>Educational qualification</b>				
Diploma	00 (00)	8 (06)	00 (00)	0.169
Undergraduate	6 (5)	26 (21)	4 (03)	
Postgraduate	6 (5)	22 (18)	2 (1)	
Others	2 (1)	42 (35)	2 (1)	

Chi-square test was used at a 5% level of significance for the evaluation of the association of different levels of practice with age groups and educational qualification.  
n: Total number of patients available with the data

results were found by Sethi *et al.*, Kumar *et al.*, and Singh *et al.* [13-15]. Over half of the population (55%) consisted of undergraduates or postgraduates, similar to an analysis by Kumar *et al.* [13]. Lack of knowledge about the disease in educated individuals is a disturbing aspect of the management of hypothyroidism. About 50% of respondents had knowledge about the meaning of hypothyroidism; a study by Rai *et al.* also shows similar results [12]. Symptoms of hypothyroidism are non-specific and likely to overlap with other conditions of the disease. Fatigue is the most common symptom and could be the greatest misleading one too, but in our study, half of the participants identified fatigue as a symptom of hypothyroidism. Similarly, in a study conducted by Sethi *et al.*, a good number of the participants identified fatigue as a clinical symptom of hypothyroidism [14]. Knowledge of disease symptoms is essential for patients to identify treatment effects, disease progression, and to tell a doctor about their clinical experiences during follow-up visits. About 55% of the study subjects believe hypothyroidism may run through families, but this is in contrast to a study conducted by Kumar *et al.* where only 12% believe the genetic cause of hypothyroidism [10]. Likewise, only 21% of patients were aware of pregnancy hypothyroidism, possibly because they were not conscious that pregnancy hypothyroidism would occur; this is in accordance with a study by Kumar *et al.* [13]. Complications linked to untreated pregnancy hypothyroidism are diverse and intense, with a higher risk of maternal morbidity, perinatal disease, and death. In this present study, 98% of the patients are adherent to thyroxine therapy. This result is similar to a study conducted by Sethi *et al.* [14]. Half of the population believes cabbage, cauliflower, and soya should be avoided. It is been found that 44% of the study subjects were extremely concerned about hypothyroidism, which was neither influenced by the age nor the educational qualification. It was observed that nearly 80% of the study subjects found to be practicing with moderate levels of precaution, irrespective of their age, and educational qualification, which was similar to a study done by Sethi *et al.* [14].

Overall, this study shows that although patients were more aware of symptoms, they were less aware of the risks associated with hypothyroidism, the value of laboratory testing, and dietary precautions. Medication compliance and regular thyroid function testing can only be influenced if patients are aware of the effects of their conditions of disease. Therefore, this aspect can be emphasized in programs for patient awareness. About three-fourths of patients were seeking information from healthcare experts rather than the Internet. It illustrated the need for ongoing doctor therapy and expanded appointment healthcare experts' time for patient education.

This research could be constrained by the cross-sectional layout of the sample. As this study was conducted at a single center, the results may not be representing a large population. And therefore, a multicentric study to get to the impact of various demographic patterns and sociocultural differences on KAP in patients with hypothyroidism could reveal more insights on thyroid disorder.

## CONCLUSION

Our study highlighted the significance of investing appropriate time to provide patients with a comprehensive education to bridge the gaps in patient care. The findings also indicated that it be better for the understanding of the patients if health-care providers could provide patients with data sheets explaining the disease or having some pictorial/pamphlets about the disease's reality and myths.

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## AUTHORS' CONTRIBUTIONS

VDPG and SSM contributed to data collection and manuscript writing, SSR contributed to designing the study, follow-up, and final review.

## CONFLICTS OF INTEREST

There are no conflicts of interest.

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