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Original Research Article

Knowledge and awareness regarding thyroid disorder among paramedical students

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ABSTRACT

Background: Thyroid disease ranks as the second most common endocrine disorder worldwide, following diabetes. In India, the prevalence mirrors global trends, with approximately 42 million individuals affected, accounting for one in ten adults.
Methods: A cross-sectional study was conducted with 1064 paramedical students aged 18-25 years. The study received approval from the institutional ethics committee, and informed consent was obtained from all participants. Data on knowledge and awareness were collected using a questionnaire. Statistical analysis, including frequency, mean, standard deviation, percentage was performed using SPSS version 2.0.
Results: The study found that 31.86% of students had a low level of knowledge about thyroid disorders, while 24.90% demonstrated a high level of knowledge on thyroid symptoms. Additionally, 8.17% of students showed good awareness of thyroid disorders, whereas 42.01% had low awareness levels. Third-year students aged 20-22 exhibited higher awareness (12.40%) of lifestyle factors and preventive measures affecting thyroid health.
Conclusions: There were significant gaps in knowledge and awareness of thyroid disorders among paramedical students. Enhancing education and outreach efforts could help bridge these gaps, empowering individuals to recognize symptoms, seek timely diagnoses, and access appropriate treatment.

Keywords: Awareness, Knowledge, Paramedical students, Thyroid disease

INTRODUCTION

Thyroid diseases are among the most prevalent endocrine disorders worldwide, with India reporting a significant number of cases. An estimated 42 million people in India are affected by thyroid disorders, with a prevalence of hypothyroidism at 11%. This is notably higher compared to 2% in the United Kingdom and 4-6% in the United States.[1] The thyroid gland, situated in the anterior neck and butterfly-shaped, is essential for regulating metabolic processes and physiological functions.

Thyroid diseases encompass a range of conditions, including hyperthyroidism, which is characterized by excess production of thyroid hormones, and hypothyroidism, marked by insufficient hormone production. Autoimmune disorders like Hashimoto's thyroiditis and Graves' disease result in hypothyroidism and hyperthyroidism, respectively. Thyroid tumors, which can be noncancerous growths such as nodules or adenomas, may also produce excess thyroid hormones, while malignant growths within the thyroid gland constitute thyroid cancer. Additionally, postpartum thyroiditis involves inflammation of the thyroid following childbirth.

Hypothyroidism presents with symptoms such as fatigue, dry skin, weight gain, bowel and menstrual irregularities, hair loss, and muscle pain. Treatment typically includes conservative management through smoking cessation and

weight loss, medical treatment with levothyroxine (T4) and regular monitoring of TSH levels, and surgical treatment, such as thyroidectomy, if local structures are compressed. Conversely, hyperthyroidism manifests through palpitations, fatigue, tremors, anxiety, sleep disturbances, weight loss, intolerance to heat, sweating, and excessive thirst. Its treatment involves conservative management with smoking cessation, especially important in cases of Graves' ophthalmopathy, medical treatment with beta-blockers and medications like carbimazole or propylthiouracil, and surgical interventions such as subtotal or total thyroidectomy.

This study aimed to assess the knowledge and awareness of thyroid disorders among paramedical students. Understanding their level of awareness regarding signs, symptoms, preventive measures, and lifestyle factors influencing thyroid health is crucial. By evaluating these parameters, the study seeks to highlight gaps in knowledge and suggest areas for improved educational outreach and intervention, ultimately aiding in better management and early diagnosis of thyroid disorders.

METHODS

A cross-sectional study was conducted from November 2023 to May 2024 at Dr. M. G. R. Educational and Research Institute in Chennai, India. The study sample consisted of 1,064 paramedical students aged 18 to 25 years.

Inclusion criteria

Paramedical students within the age range of 18 to 25 years.

Exclusion criteria

Students who did not consent to participate.

Statistical analysis

The data were analyzed using SPSS version 2.0. The analysis included calculating frequencies, means, standard deviations, and percentages.

Ethical approval for the study was obtained from the institutional ethical committee (approval number 985/2023/IEC/ACSMCH, dated November 17, 2023). Informed consent was secured from all participants.

A questionnaire, developed by reviewing existing literature and research articles, was used to collect data. The questionnaire contained 21 questions divided into three categories:

Knowledge assessment (11 questions)

This section included questions about the symptoms and effects of thyroid disorders (e.g., weight changes, hair loss, skin problems, stress, anxiety, depression, mood swings) (Table 2).

Awareness of thyroid disorders (7 questions)

This section evaluated participants' understanding of factors related to thyroid disorders, such as the consumption of iodized salt, the impact of certain foods (e.g., cauliflower, cabbage, soya), and national health programs for thyroid disorder control (Table 3).

Awareness of thyroid screening (3 questions)

This section assessed knowledge about thyroid screening, including family history of thyroid disorders, previous thyroid screening tests, and reasons for undergoing these tests (Table 4).

Responses were assigned specific point values: 0 for "no", 1 for "yes", and 2 for "don't know" for the knowledge and awareness questions. The data were then converted into percentages, with scores categorized as follows: more than 60% indicating high knowledge, 40-60% indicating average knowledge, and less than 40% indicating low knowledge.

RESULTS

Out of 1064 study participants, 697 (65.5%) were female and 367 (34.5%) were male. In terms of age distribution, 728 (68.4%) were in the 18-19 years age group, 322 (30.3%) were in the 20-22 years age group, and 14 (1.3%) were in the 23-25 years age group. Regarding their academic year, 283 (28.6%) were in their first year, 445 (41.8%) in their second year, 298 (28%) in their third year, and 38 (3.6%) in their fourth year (Table 1).

Table 1: Demographic data of participants.

Variables	Frequency (n=1064)	Percentage
Age group distribution (years)		
18-19	728	68.40
20-22	322	30.30
23-25	14	1.30
Gender distribution		
Male	367	34.50
Female	697	65.50
Present year distribution		
1st year	283	26.60
2nd year	445	41.80
3rd year	298	28.00
4th year	38	3.60

The study found that 88.4% of respondents correctly identified the impact of thyroid disorders on weight gain or loss. Hair loss, caused by both hyperthyroidism and hypothyroidism, was correctly recognized by 63.0%. Menstrual cycle impacts, such as dysmenorrhea, were correctly identified by 71.8%. Goiter, a swelling around

the neck, was noted by 83.0%. Major symptoms such as palpitations, trembling, temperature imbalances, restlessness, and confusion were correctly identified by over 50% of respondents (Table 2).

Table 2: Distribution of knowledge on thyroid symptoms of study participants.

Questions	Yes N (%)	No N (%)	Don't know N (%)
Patient with thyroid disorder will have weight gain/loss	941 (88.4)	69 (6.5)	54 (5.1)
Patient with thyroid disorder will have hair-fall/ skin problems	670 (63.0)	153 (14.4)	241 (22.7)
Patient with thyroid disorder will have irregular menstrual cycles	764 (71.8)	164 (15.4)	136 (12.8)
Patient with thyroid disorder experience voice change/ swelling in neck	883 (83.0)	96 (9.0)	85 (8.0)
Patient with thyroid disorder will have constipation/ diarrhea	242 (22.7)	385 (36.2)	437 (41.1)
Patient with thyroid disorder can lead to infertility/ repeated miscarriage/ stillbirth	563 (52.9)	295 (27.7)	206 (19.4)
Patient with thyroid disorder results in trembling in hands/ palpitation/ shortness of breath	497 (46.7)	297 (27.9)	270 (25.4)
Patient with thyroid disorder experience excessive sensitivity to heat/ cold	567 (53.3)	309 (29.0)	188 (17.7)
Patient with thyroid disorder feel tiredness/ restlessness	770 (72.4)	145 (13.6)	149 (14.0)
Patient with thyroid disorder experience difficulty in remembering/ confusion/ lack of concentration	392 (36.8)	297 (27.9)	375 (35.2)
Patient with thyroid disorder has stress/ anxiety/depression/mood swings	698 (65.6)	202 (19.0)	164 (15.4)

Most respondents (60.5%) do not have a familial history of thyroid disorder, although thyroid disease is often hereditary. Autoimmune disorders and mutations in the PAX8 and TSHR genes are linked to congenital hypothyroidism. Due to low awareness of familial thyroid disorders, only 60.5% have undergone screening. Physician recommendation was the primary reason for screening (65.1%), while symptoms and online advertisements contributed to less than 25% of the awareness (Table 4).

Table 3: Distribution of awareness on thyroid disorder of study participants.

Questions	Yes N (%)	No N (%)	Don't know N (%)
Non-iodized salt should be consumed?	447 (42.0)	335 (31.5)	282 (26.5)
Food items (cauliflower, cabbage, and soya) have any role in thyroid disorder?	470 (44.2)	357 (33.6)	237 (22.3)
Does caffeine affect thyroid?	455 (42.8)	343 (32.2)	266 (25.0)
Thyroid medications should be stopped during pregnancy	487 (45.8)	328 (30.8)	249 (23.4)
Thyroid disorder affects intelligence quotient (IQ)?	274 (25.8)	399 (37.5)	391 (36.7)
Thyroid is a sedentary lifestyle disorder?	465 (43.7)	350 (32.9)	249 (23.4)
Is there any national health program for the control of thyroid disorder?	511 (48.0)	397 (37.3)	156 (14.7)

Table 4: Distribution of awareness on thyroid screening among study participants.

Questions	Yes		No	
	N	%	N	%
Family history of thyroid disorder	420	39.50	644	60.50
Undergone the thyroid screening test	383	36.00	681	64.00
	N		**%**	
If yes, reasons to undergone for thyroid screening				
On suggestion of doctor	693		65.10	
On suggestion of friends and relatives	91		8.60	
Based on symptoms noticed/just to check health status	152		14.30	
Read on online portals/newspapers	128		12.00	
If no, reasons not to undergone for thyroid screening				
Lack of time	410		38.50	
Never felt need of it	654		61.50	

In terms of knowledge levels on thyroid symptoms 31.86% had a low level, 43.23% had an average level, and 24.9% had a high level. When it comes to awareness of thyroid disorders, 42% had a low level, 49.81% had an average level, and 8.17% had a high level (Table 5).

Table 5: Level of knowledge and awareness among study participants.

Level	Low score (<40%)		Average score (40-60%)		High score (>60%)	
	N	%	N	%	N	%
Knowledge	339	31.86	460	43.23	265	24.90
Awareness	447	42.01	530	49.81	87	8.17

DISCUSSION

The results of this study on the knowledge and awareness of thyroid disorders among the participants revealed varying levels of understanding. Awareness of thyroid symptoms was generally high, with 88.4% correctly identifying weight gain or loss, 63.0% recognizing hair loss symptoms, 71.8% acknowledging menstrual cycle impacts, and 83.0% identifying goiter symptoms. Other major symptoms such as palpitations, trembling, temperature imbalances, and restlessness were correctly recognized by more than 50% of respondents. This high level of symptom awareness is encouraging, suggesting that many participants are capable of identifying potential signs of thyroid disorders (Table 2).

A significant portion, 42.0%, of participants were found to be using non-iodized salt, which contrasts with findings by Serin et al where 50.4% were aware of the benefits of iodized salt.[2] This suggests that nearly half of the participants lack essential knowledge about the role of iodized salt in thyroid health (Table 3).

Regarding dietary knowledge, 44.2% correctly identified foods like cabbage and soy as containing goitrogens, which aligns closely with the findings of Chandra et al (40.98%) and Rai et al (44.8%).[3,4] This indicates a moderate level of awareness about dietary factors affecting thyroid function. However, more than half of the participants were unaware, underscoring the need for improved nutritional education related to thyroid health.

Caffeine's impact on thyroid function was correctly understood by 42.8% of respondents, a notable increase from Sharma et al study, which reported only 28.8%.[5] This relatively low level of awareness suggests that further education on lifestyle factors influencing thyroid function is necessary (Table 3).

Concerning the safety of thyroid medication during pregnancy, 30.8% of participants correctly identified levothyroxine as safe, while 45.8% did not, in contrast to Sharma et al study (20.5%).[5] This highlights a need for more targeted education for women of childbearing age regarding the safety of thyroid medication during pregnancy (Table 3).

Awareness of the negative impact of untreated hypothyroidism on children's IQs was low, with only 37.5% of participants answering correctly. This points to a significant gap in knowledge about the developmental consequences of untreated thyroid disorders, which could have long-term public health implications.

Only 43.7% of respondents recognized the link between a sedentary lifestyle and thyroid conditions, indicating a need for increased promotion of active lifestyles to help prevent thyroid disorders.

Knowledge of the National Iodine Deficiency Disorders Control Programme (NIDDCP) was correctly identified by 48.0% of respondents. While this is nearly half of the study population, it also indicates that a substantial number of participants remain unaware of national initiatives aimed at controlling iodine deficiency.

Most respondents (60.5%) did not report a familial history of thyroid disorders, indicating a lack of awareness about the hereditary nature of these conditions. Consequently, only 60.5% of participants had undergone thyroid screening. Among those who had been screened, 65.1% did so based on physician recommendations, while awareness from symptoms and online advertisements accounted for less than 25%. This highlights the critical role of healthcare providers in promoting thyroid screening and the need for increased public awareness campaigns to encourage proactive health monitoring (Table 4).

The study's limitations include its focus on paramedical students from a single institution, potentially limiting generalizability. Voluntary participation may introduce selection bias, and the use of basic statistical methods and a cross-sectional design restricts the depth and temporal scope of the findings.

CONCLUSION

The study results indicate that while there is a moderate to high level of awareness regarding certain aspects of thyroid disorders, significant gaps persist in understanding dietary factors, the hereditary nature of thyroid diseases, and the importance of thyroid medication during pregnancy. These gaps highlight the need for enhanced educational efforts to improve overall awareness and encourage proactive health measures related to thyroid disorders. To address these gaps, thyroid disorder awareness campaigns should utilize a variety of strategies, including media outreach, community programs, educational materials, and healthcare partnerships.

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