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Original Research Article

A cross-sectional study to assess the knowledge and awareness regarding thyroid disorder among university students, Chandigarh, India

Charu Sharma[1]*, Ravi Rohilla[2], Manoj Kumar[1]

[1]Centre for Public Health, Panjab University, Chandigarh, India
[2]Department of Community Medicine, Government Medical College and Hospital, Chandigarh, India

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***Correspondence:**
Charu Sharma,
E-mail: sharmacharu2527@gmail.com

ABSTRACT

Background: Globally, despite being the most prevalent chronic medical condition, thyroid disorder is one of the most under-diagnosed and overlooked health problems which account for a significant number of complaints in adolescents, and adults. The objective of the study was to assess the knowledge and awareness among students related to the spectrum of thyroid diseases.
Methods: This was a questionnaire-based, cross-sectional study conducted at Panjab University, Chandigarh, India between February 2020 and August 2020. Purposive sampling was employed. The nature of the data was quantitative and was analyzed through statistical package for the social sciences (SPSS) (version 20.0).
Results: Out of 224 students enrolled, of which 60.7% were females, 38.9% were males, and 0.4% transgender with a mean age of 23.52±2.47 (max-min=18-32 years). Around 45.2%, 55.7%, and 46.1% students had incorrect/no knowledge that irregular menstrual cycles, swelling in the neck, and stress/depression were manifestations of thyroid disorder, respectively. Students had poor knowledge regarding various risks associated with thyroid such as infertility (56.2%), hereditary disorder (46.1%), and medications causing thyroid (58%). 65.7% were not aware that thyroid disorder affects the level of IQ. 43.4% respondents undergone thyroid screening on the suggestion of a doctor (50.5%), while 7.4% self-prescribed themselves after reading on online portals. Significant associations were found between gender and the different levels of knowledge and awareness.
Conclusions: This study identified significant lacuna in the knowledge and awareness about the symptoms, factual statements, and fallacies associated with the thyroid disorder.

Keywords: Thyroid disorder, Students, Knowledge, Awareness, Prevention

INTRODUCTION

Thyroid disease is one of the world's most abundant endocrine diseases second to diabetes; India is no exception. According to numerous studies, the reports indicate that 300 million people worldwide are suffering from thyroid disorders, of which approximately 42 million are living in India, affecting every one in ten adults.[1] Thyroid is one of the chronic non-communicable disease that affects women more than men.[2]

Iron deficiency disorder (IDD) is considered a major public health problem worldwide. The prevalence of hypothyroidism in India is 11%, compared with only 2% in the United Kingdom (UK) and 4-6% in the United States of America (USA).[3] Compared with coastal cities, cities located inland have a higher prevalence (11.7% versus 9.5% respectively). Also, hypothyroidism is more common in North India while hyperthyroidism in the South and West zones of India.[4] It is not quite common in the 20's but recently its symptoms are starting to get

evident amongst youngsters as well.[5] Several myths and fallacies continue to influence the management of this common disease, even today, despite having scientific evidences. The study focuses on students, as thyroid tends to impact adults between the age of 18-35, which is the most productive, as well as the prime reproductive period of their life as they tend to suffer the most stress at that time.[6] Limited data is available on this topic in India especially among students, when reviewing the literature the focus group was female (college students, thyroid patients, pregnant women) while this study provides equal opportunities to all genders. Thus, the present study was planned to conduct in university students.

METHODS

A cross-sectional study was designed to assess the knowledge and awareness regarding thyroid disorder among Panjab University students situated in Union Territory Chandigarh, India. The data was collected through quantitative data collection instruments. For this purpose, the same size obtained was 400 initially but it was constricted to 224 due to COVID-19 pandemic in March 2020. A purposive sampling technique was employed. The study was conducted in both North and South campus of the University from February 2020 to August 2020. The data collection was done online through a digital platform in the form of Google forms. The distribution of the forms was independent of genders. Informed consent was taken from the participants.

Initially, a pilot study (offline) was performed on 40 students of the university. After analyzing the results, a modified pro forma was prepared. The students were introduced to the main objectives of the study and reassured that personal information would be kept confidential. The study used understanding and awareness of the disease as the dependent variable and socio-demographic (age, gender, and marital status) as independent variables. Categorical variables were presented as proportions whereas continuous variables were shown as mean and standard deviation. Chi square test was used to see the association between two categorical variables and level of significance was kept at p value of <0.05. The data was interpreted and analyzed using excel and statistical package for the social sciences (SPSS) (version 20.0).

RESULTS

Out of 224 students enrolled, of which 60.7% were females. Most students were graduates 122 (54.5%). 117(52.2%) respondents were from Non-sciences departments. Among them 204 (91.1%) were unmarried, followed by married 18 (8.0%). These variables are used as potential measures of social support. 219 (97.8%) students have heard or aware of thyroid disorder of which 134 were females, 84 males and 1 transgender. Only 5 (2.2%) respondents haven't heard of thyroid disorder. Among the manifestations of the thyroid, weight gain/loss was most correctly marked by 95.0% of students and 33% said that thyroid disorders have no symptoms (Table 1).

Most of the male students (63.1%) had a low level of knowledge and the females had high level knowledge (21.6%). The low level of knowledge among the gender is p=0.002 and the high level with p=0.001 (rejection of the null hypothesis- that students have no knowledge and awareness of thyroid disorders) demonstrated a significant statistical difference between the knowledge among gender, while the average level had not reflected any statistically significant difference (Table 2).

A considerable number of respondents had the right information that thyroid disease is not contagious (95%) and it is treatable (93.6%); alternative forms of treatments are also effective (73.5%). 53.9% believed that it is a hereditary disorder (Table 3).

The overall domain score indicates that participants had an average level (63%) of understanding. Low and high levels of knowledge were more prevalent in males (3.6%) and females (45.5%), respectively. 0.016 p value shows a significant statistical disparity between the context of facts and gender variables (rejection of the null hypothesis). However, there is no significant difference seen between the low and average levels in both genders (Table 4).

47% respondents believed the misconception that thyroid didn't affect the level of IQ, while only 32% respondents were aware that there is national health programme for the control of thyroid disorder (Table 5).

The absolute awareness illustrated that 16.4% of females had a low level of awareness relative to 25% of males. Both genders showed no statistical significance in their beliefs, hence there is no substantial difference in their awareness aspect. Thus, females have a better average (70.2%) and high (13.4%) level of awareness as compared to males at 66.7% and 8.3%, respectively (Table 6).

63% of respondents had family history of thyroid disorder, of which mother has 47.0% followed by father 3.2%, sister 11.0%, and brother 1.8%. This strongly supports the statement that females struggle more with this disease than males and are more prone to have this condition (Table 7).

5.5% respondents mentioned that there is barely any need for awareness of thyroid disorder, while 94.5% manifests, there is a strong need for awareness among both the modern generation and general public. Respondents express their views on varied prevention approaches of thyroid disorder. 92.7% said that a potential health-seeking behavior can be accomplished by encouraging physical activity, 53.4% mentioned by avoiding sedentary lifestyle, 75.3% said healthier eating patterns, 46.6% by taking suitable medications, and 62.6% said that frequent screening can be performed early to reduce the possibility of developing such conditions.

Table 1: Responses related to the symptoms of thyroid disorder.

Questions	Frequency [N=219], n (%)		
	Yes	No	Don't know
Weight gain/loss	208 (95.0)	2 (0.9)	9 (4.1)
Hair-fall/skin problems	86 (39.3)	23 (10.5)	110 (0.2)
Irregular menstrual cycles	120 (54.8)	13 (5.9)	86 (39.3)
Voice change/swelling in neck	97 (44.3)	14 (6.4)	108 (9.3)
Constipation/diarrhea	50 (22.8)	39 (17.8)	130 (9.4)
Infertility/repeated miscarriage/stillbirth	96 (43.8)	20 (9.1)	103 (47.1)
Trembling in hands/palpitation/shortness of breath	61 (27.9)	24 (11.0)	134 (1.1)
Excessive sensitivity to heat/cold	67 (30.6)	28 (12.8)	124 (56.6)
Tiredness/restlessness	106 (48.4)	17 (7.8)	96 (43.8)
Difficulty in remembering/confusion/lack of concentration	124 (56.6)	35 (16.0)	60 (27.4)
Stress/anxiety/depression/mood swings	118 (53.9)	8 (3.6)	93 (42.5)

N: Total number of participants; n: total no. of responders

Table 2: Evaluation of association of different levels of symptom's knowledge with gender.

Gender	Levels of knowledge domain, n (%)		
	Low	Average	High
Female	46 (34.3)	59 (44.1)	29 (21.6)
Male	53 (63.1)	27 (32.1)	4 (4.8)
Test of significance	χ^2=9.47*, df=2	χ^2 =1.82, df=2	χ^2 =9.68, df=2
P value	0.002	0.176	0.001

*χ^2 test was used at 5% level of significance. For the analysis: low level ≤5 points, average level 6-10 points, high level ≥11 points; and n: total no. of responders available with data

Table 3: Details of correct responses of participants on knowledge domain.

Questions	Frequency [N=219] n (%)		
	Yes	No	Don't know
Do you think iodine deficiency in diet may lead to thyroid disorder?	182 (83.1)	11 (5.0)	26 (11.9)
Certain medications may increase the risk for developing thyroid disorder	92 (42.0)	9 (4.1)	118 (53.9)
Females are at lower risk of developing thyroid disorders than males?	7 (3.2)	154 (70.3)	58 (26.5)
Thyroid disorders are treatable	205 (93.6)	7 (3.2)	7 (3.2)
Alternative forms of medicine (such as Homeopathy/ Ayurveda) are useful to treat thyroid disorders	161 (73.5)	13 (5.9)	45 (20.5)
Do thyroid disorders run in families?	118 (53.9)	31 (14.2)	70 (32.0)
Is thyroid disease a communicable disease?	4 (1.8)	208 (95.0)	7 (3.2)
Does dietary patterns or habits affect thyroid functions?	190 (86.8)	2 (0.9)	27 (12.3)

N: Total number of participants; n: total no. of responders

Table 4: Evaluation of association of different levels of knowledge domain with gender.

Gender	Levels of knowledge domain n (%)		
	Low	Average	High
Female	1 (0.8)	72 (53.7)	61 (45.5)
Male	3 (3.6)	60 (71.4)	21 (25)
Test of significance	χ^2=2.4**,df=2	χ^2=2.64, df=2	χ^2=5.78, df=2
P value	0.121	0.104	0.016

**χ^2 test was used at 5% level of significance. For the analysis: low level ≤3 points, average level 4-8 points, high level ≥9 points; n: total no. of responders available with data

Table 5: Details of correct responses of participants on awareness domain.

Questions	Frequency [N=219] n (%)		
	Yes	No	Not sure
Non-iodised salt should be consumed?	21 (9.6)	144 (65.8)	54 (24.7)
Food items (cauliflower, cabbage and soya) have any role in thyroid disorder?	70 (32.0)	16 (7.3)	133 (60.7)
Does caffeine affect thyroid?	63 (28.8)	12 (5.5)	144 (65.8)
Thyroid medications should be stopped during pregnancy	40 (18.3)	45 (20.5)	134 (61.2)
Thyroid disorder affect intelligence quotient (IQ)?	75 (34.2)	41 (18.7)	103 (47)
Thyroid is a sedentary lifestyle disorder?	153 (69.9)	20 (9.1)	46 (21.0)
Is there any national health programme for the control of thyroid disorder?	70 (32.0)	10 (4.6)	139 (63.5)

N: Total number of participants; n: total no. of responders

Table 6: Evaluation of association of different levels of awareness domain with gender.

Gender	Levels of awareness domain, n (%)		
	Low	Average	High
Female	22 (16.4)	94 (70.2)	18 (13.4)
Male	21 (25)	56 (66.7)	7 (8.3)
Test of significance	χ^2=1.9***, df=2	χ^2=0.762, df=2	χ^2=1.143, df=2
P value	0.168	0.762	0.285

***χ^2 test was used at 5% level of significance. For the analysis: low level ≤3 points, average level 4-8 points, high level ≥9 points; and n: total no. of responders available with data

Table 7: Awareness regarding thyroid screening along with personal and family history of thyroid disorder.

Questions	Yes, n (%)
Family history of thyroid disorder (N=219)	138 (63)
Undergone the thyroid screening test (N=219)	95 (43.4)
Deranged reports of respondents (N=95)	61 (64.2)
Reasons to undergone for thyroid screening (N=95)	
On suggestion of doctor	48 (50.5)
On suggestion of friends and relatives	28 (29.5)
Based on symptoms noticed/Just to check health status	12 (12.6)
Read on online portals/newspaper	7 (7.4)
Reasons not to undergone for thyroid screening (N=124)	
Lack of time	30 (24.2)
Never felt need of it	94 (75.8)

N: total no. of responders, and n: total no. of responders available with data

DISCUSSION

The pattern of thyroid disorders depends on several factors, such as age, sex, geographic factors, and iodine intake. In the present study, only 2.2% of participants hadn't heard, while 97.8% were aware of thyroid disorder. When this was compare to the similar study conducted by Rai et al.[7] Out of the 250 females, 54.80% knew that "thyroid" was a normal gland in our body, while the remaining 26.40% had no idea about it. Symptoms of thyroid are likely to overlap with other disease conditions. Weight gain and exhaustion are the most common symptoms and perhaps the most deceptive.

In the current study, symptom's (correct) responses for thyroid were weight gain/loss (95.0%), tiredness/ restlessness (48.4%), irregular menstrual cycles (54.8%), infertility/repeated miscarriage/stillbirth (43.8%), constipation/diarrhea (22.8%), hair fall/skin problems (39.3%), difficulty in remembering/confusion/ poverty of concentration (56.6%), stress/depression (53.9%). When this was compared to a similar study done by Kumar et al included 250 participants; perceived hypothyroid symptoms were weight gain (93.6%), easy fatigue (80%), irregular menstrual cycle (65.2%), infertility (55.6%), and hair-loss (41.2%), and skin problems (38%).[8]

Also, 17% related thyroid disorders to disturbances in the menstrual cycle/recurrent miscarriage/stillbirth, while 30.3% related that to psychological factors as depression/confusion/lack of concentration/mood

swings/anxiety, and 25.3% constipation/diarrhea in the study conducted by Mohammed et al.[9]

Overall, 73.5% stated that alternative medicines could cure thyroid diseases, of which 73.9% of females claimed the same in this current analysis while Rai et al observed that 55.2% of females felt that alternative medicines such as Ayurveda, Yoga, Unani, Siddha, and Homeopathy could cure thyroid disease, and 28% in a similar study by Kannan et al.[7,10] In this survey, 53.9% believed thyroid is a hereditary disease and 1.8% believe that it is contagious. In a similar study, Kumar et al recorded 12.4% and 1.6% respectively.[8] In the current research, 83.1% respondents agreed that iodine deficiency contributes to thyroid disorders and 65.8% agreed that iodized salt should be consumed; as compared to the Serin et al analysis, 50.4% were aware that iodized salt should be used.[11] In this survey, 32.0% believed food products (goitrogens) affects thyroid. When compared to the study of Chandra et al 40.98% of patients agreed that goitrogens need to be prevented in the diet and 44.8% in a study conducted by Rai et al.[7,12]

In the current study, 18.3% participants said that thyroid medications should be stopped during pregnancy when compared with a parallel study done by Singh et al, 37% respondents had the same belief.[13] Out of total, 63% of respondents have family history (parents/siblings) of thyroid disorder in the present research. When compared to the study of Deokar et al data reveals the highest thyroid stimulating hormone (TSH) concentration was seen in the age group 60-69 years and lowest TSH was seen in 10–19 years.[14]

Limitations

Due to the nationwide lockdown for the containment of COVID-19, the sample size of the study was constricted.

CONCLUSION

In general, the students had inadequate knowledge of thyroid disorder. Overall females have better knowledge as compared to males. Also, those respondents who had a family history of thyroid disease were not that much well aware of the condition. Public health measures are needed to raise the understanding and awareness of the disease among students (irrespective of gender, education streams) which is quite essential for better outcomes of any chronic disease. Hence, these aspects need to be highlighted, discussed and reappraised.

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