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### RESEARCH ARTICLE

#### CO-RELATION BETWEEN THYROID FUNCTION AND ACADEMIC PERFORMANCE OF B.SC. NURSING STUDENTS IN A SELECTED COLLEGE IN BANGALORE.

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#### Manuscript Info

##### Manuscript History

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#### Abstract

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#### Introduction:-

India has the distinction of producing maximum number of nurses in the health care setting. Students pursuing Nursing education come with varying abilities from diverse backgrounds, undergo rigorous and strenuous training, witness a varying degree of performance in general and in academics. Decline in students academic performance can be attributed to various factors. While teachers and parents draw attention to reasons such as psychological, environmental, family and peer factors, Physical and health issues are seldom probed as contributors to poor academic performance.

According to a survey conducted by the Indian Thyroid Society on 2797 adults, it was found that one in ten adults in India suffer from hypothyroidism and the awareness of the disease is ranked ninth as compared to other common ailments<sup>2</sup>. The female populations are 3 times more prone to be affected than men. Thyroid hormone plays a crucial role as a regulator of nervous system, growth and puberty, and of metabolism and organ functions. There is mounting evidence to suggest that mild (subclinical) thyroid disorders may be potential contributors to significant clinical conditions. However, the relationship between subclinical hypo-hyperthyroidism and cognition among adolescents has been studied much less (National Health and Nutrition Examination survey) (NHANES III).

It would be worthwhile to investigate whether there could be a correlation between learning disabilities and cognitive performance among the female population as well, which has not been quoted in many Indian studies.

The investigators being Nursing faculty with vast years of experience in the field of Nursing education felt a strong need to explore the possibility of a co-relation between the students' Thyroid function and their academic performance.

#### The Objectives of the study were:

1. To determine the thyroid function of B.Sc. Nursing students.
2. To evaluate the overall academic performance of B.Sc. Nursing students in one academic year
3. To determine the co-relation between thyroid function and academic performance
4. To determine the association of
5. Thyroid functions with selected baseline variables
6. Academic performance with selected baseline variable.

**Review of literature:-**

An Epidemiological survey on thyroid dysfunction in India (2011) has shown that approximately 42 million people in India suffer from Thyroid dysfunction for which early diagnosis and treatment remain the corner stone of management<sup>3</sup>.

A descriptive study was conducted in Boston to test the hypothesis that learning disabilities were more common in individuals with thyroid problems. Findings revealed that those with hyper/hypothyroidism were 2.5 times more prone to have learning disabilities, reading and writing difficulty, poor spellings, grade failure in school, developmental delays in childhood as compared with the controls<sup>4</sup>.

In NHANES III, 1988-94, serum T3 and TSH were measured and cognitive function was assessed for adolescents in the US, to examine the relationship of subclinical hypo/hyper- thyroidism with cognitive performance. Sample size were 1327 Adolescents. Cognitive performance was assessed using subscales of Wide Range Achievement Test (WRAT) and Wechsler Intelligence Scale. 1.7% and 2.3% had subclinical hypo and hyperthyroidism respectively. Cognitive assessment scores were lower in them as compared to the Euthyroid group.

**Materials and Methods:-**

A Quantitative approach **was adopted for this study. The research design selected was descriptive and cross sectional.** To eliminate the strong influence of extraneous variables such as those affecting adjustment in students, the investigators planned to include only 2<sup>nd</sup> year and 3<sup>rd</sup> year B.Sc. Nursing students and thus arrived at the sample size of 150 (75 in each batch). Questionnaire was provided for demographic variables, University marks score sheet and thyroid function test values **were used for analysis.** After obtaining administrative permission and ethical clearance, an informed written consent was obtained from the participants. Most recent Thyroid function test values were obtained for all the participants at the beginning of academic year. The T3, T4 and TSH values were recorded in the master sheet. The subjects' academic performance score was obtained by entering university marks after declaration of results. Academic performance of the students were arbitrarily classified. The total marks was 700. The thyroid status was classified into Hyperthyroid, euthyroid & hypothyroid based on the normal values. Normal values as per St. John's medical college hospital.

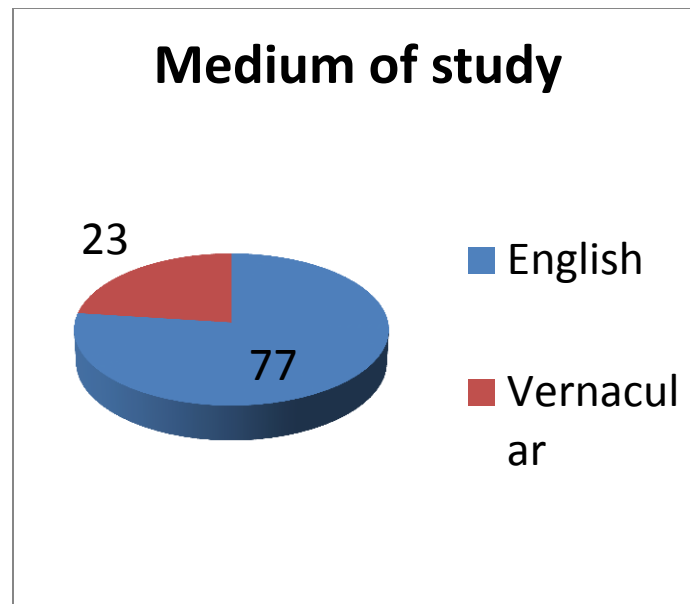
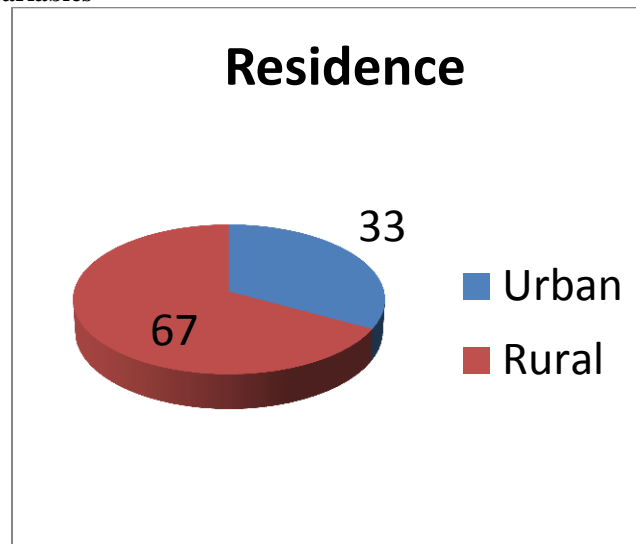
**Instrument**

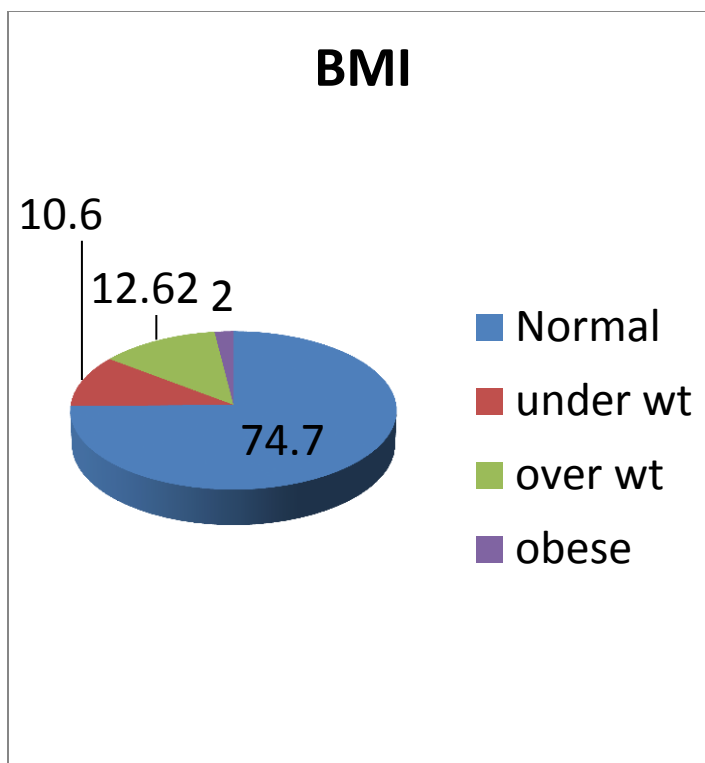
Questionnaire for demographic variables, Academic performance score sheet and thyroid function test values were used. The T3, T4 and TSH values were recorded in the master sheet. The subjects' academic performance score was obtained by entering university marks after declaration of results. Academic performance of the students were arbitrarily classified. into above average (>60% Above 420 marks), average (50-60 % 350-420) & below average (< 50 % Below 350 marks). The total marks was 700. The thyroid status was classified into Hyperthyroid, euthyroid & hypothyroid based on the normal values. Normal values as per St. John's medical college hospital were noted as reference.

T3-- 0.86-1.92ng/dl, T4 --5.5 -11.1microg /dl and TSH 0.48-4.17 IU/L.

**Result:-**

1. Description of baseline variables
2. Rural/Urban background
3. Type of diet Vegetarian/Non Vegetarian
4. Medium of education (schooling)
5. BMI – Normal wt -18.5- 24.9
6. Under wt- < 18.4
7. Over wt > 25 – 29.9
8. Obese -30 and above

**Description Of Baseline Variables**



#### Description Of Thyroid Value

T3 (Normal value -- 0.86-1.92 mg/dl)	1.138 mg/dl	$\pm 0.53$ mg/dl	0.69-4.60 mg/dl
T4 (Normal value 5.5 - 11.1 $\mu$ gm /dl)	7.34 m $\mu$ gm /dl)	$\pm 2.69$ $\mu$ gm /dl)	0.97-18.6 $\mu$ gm/dl)
TSH ( Normal value 0.48-4.17 IU /L)	2.32 IU /L)	$\pm 2.328$ IU /L)	0.008-18.15 IU /L)

#### Description Of Thyroid State

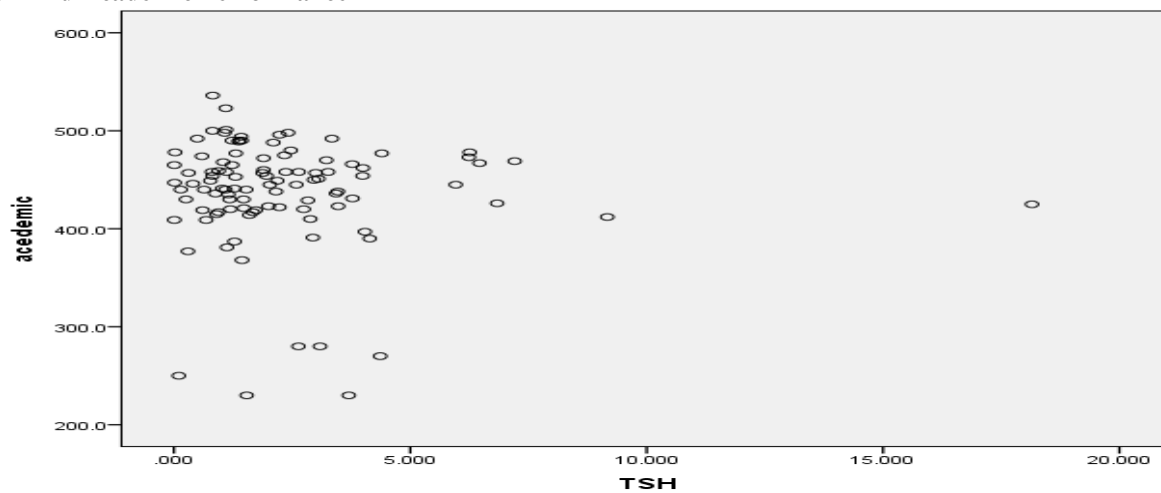
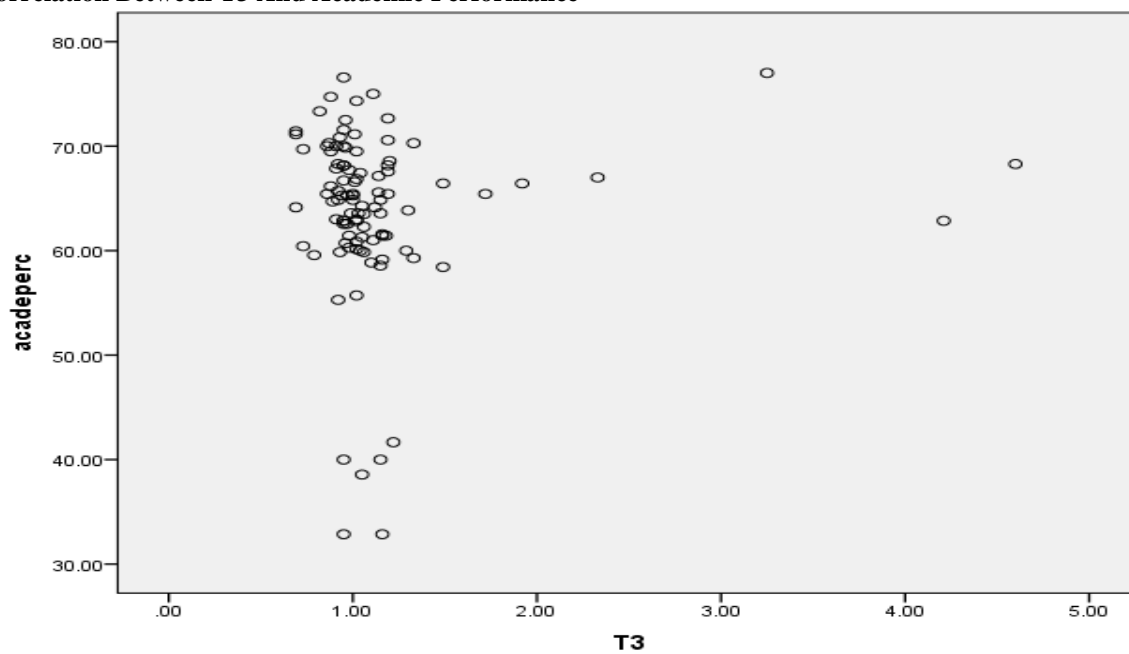
SL.NO	STATUS	FREQUENCY	PERCENTAGE
1	HYPERTHYROID	9	8.7
2	EUTHYROID	84	81.6
3	HYPOTHROID	10	9.7

#### Description Of The Academic Marks Obtained

Variable	Maximum mark	Mean mark	SD	Range
University score	700	438(62.5%)	55.5	230-536

**Description Of Academic Performance**

1	ABOVE AVERAGE(>60%) ( Above 420 Marks)	71	68.9
2	AVERAGE (50-60%) (350-420 marks)	8	7.8
3	BELOW AVERAGE (<50%) (Below 350 marks)	24	23.3

**Tsh And Academic Performance****Correlation Between T3 And Academic Performance**

**Co-Relation Between Academic Score And Thyroid Value**

VARIABLE S	Range	Mean	SD	'r ' value	'p ' value
ACADEMIC	32.86 – 77	63.88%	± 8.02	-0.062	2.67
TSH	0.008 – 18.150	2.32	± 2.32		
T3	0.69 – 4.60	1.139	±0.563	-0.193	

**Thyroid Value And Academic Performance**

Hyperthyroid	8.5%	12.5%	8.3%		
Euthyroid	80.3%	75.0%	87.5%	1.302	9.48 NS
Hypothyroid	11.3%	12.5%	4.2%		

**Association****Thyroid function and baseline variables**

1.	URBAN	3	30	1	2.673	NS
	RURAL	6	54	9		
2.	VEG	0	2	0	-	
	NON-VEG	9	82	10		
3.	ENGLISH	5	67	7	2.943	NS
	VERNACULAR	4	17	3		
4.	BMI		74	7	2.543	NS
	Normal	8	10	3		
	Overweight/Obese	1				

**Academic Performance And Baseline Variables**

Variables	Above average	Average	Below average	Test of significance Chi square	df	P value
Rural	19	4	11	3.978	2	0.13 NS
Urban	52	4	13			
Veg	2	0	0	1.506	2	0.632
Non veg	69	8	24			
English medium	58	7	14	6.042	2	0.049
Vernacular	13	1	10			S
BMI				5.96	2	0.110
Below 24.9	58	8	23			
Above 25	13	0	1			

### Discussion:-

The results revealed that 81.6% of the students were euthyroid 8.7% and 9.7% of students had hyperthyroidism and hypothyroidism respectively. Of the 103 subjects, majority (68.9%) were above average in the academic performance, while 7.8% average and 23.8% were below average. A weak negative correlation ('r' value -0.062) was found between TSH and Academic performance of students and T3 and academic performance ('r' value was -0.193). This was not statistically significant at 0.05 level of significance. Most students (67%) from rural background, Most students (98.1%) were non vegetarian, Most students (76.7%) were from English medium background, Majority had normal BMI (86.4%) (1.94%) students were obese. 11.66% were in overweight category. 81.6% of the students were euthyroid 8.7% and 9.7% of students had hyperthyroidism and hypothyroidism respectively. RELATED STUDY: In the NHANES III survey on adolescents, 2.3% and 1.7% had hypo and hyperthyroid respectively. Of the 103 subjects, majority (68.9%) were above average in the academic performance, while 7.8% average and 23.8% were below average. A weak negative correlation ('r' value -0.062) was found between TSH and Academic performance of students and T3 and academic performance ('r' value was -0.193). This was not statistically significant at 0.05 level of significance.

An attempt was made to draw an association between the 3 categories of thyroid status (Hypo, Hyper and Euthyroid) with the academic performance (Above average, Average and below average). The findings revealed that there was no association between the two variables with a chi-square value of 1.302 which was not statistically significant at 0.05 level of significance.

A Descriptive study conducted at Boston showed that the odds ratio of subjects with hypo/hyperthyroidism possessing traits of learning disability, against those who were euthyroid was 2.5.

Contrarily, in the NHANES III study, it was found that cognitive assessment scores tended to be lower in adolescents with subclinical hyperthyroidism and higher in those with hypothyroidism than the score for the euthyroid group. There was no significant association found between thyroid status and any of the baseline variables. There was no significant association found between academic performance and any of the baseline variables except in medium of instruction where the students of English medium background had a better academic performance. This is an expected finding and is self explanatory.

### Limitation:

Long time gap between timing of thyroid test and declaration of academic results. Participants' treatment pertaining to thyroid disorder is not considered in the study. Sample size was reduced to 103 instead of 150 due to non availability of blood result for many subjects as the study is not a funded one.

### Conclusion:

The study revealed that there is no correlation between the thyroid function and academic performance of Bsc Nursing students as there was only a weak negative correlation between the TSH and academic performance which was not statistically significant.

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