

**“HEALTH ANXIETY AMONG UNDERGRADUATE MEDICAL AND
NON-MEDICAL STUDENTS IN GUNTUR DISTRICT, ANDHRA
PRADESH – A COMPARATIVE STUDY”**

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ABSTRACT

Introduction: Experiencing health concerns is common, but intense health anxiety, like the “medical student syndrome”, can lead to suffering and functional impairment.

Aim: To explore health anxiety among undergraduate medical and non-medical students and make comparisons.

Methods: This cross-sectional observational study was conducted among 400 undergraduate students, equally divided between medical and non-medical fields. The Short Health Anxiety Inventory (SHAI) was utilized to measure health anxiety in the study participants. Independent samples t-test was applied to test for any significant differences in SHAI scores based on the participant’s professional groups and other characteristics.

Results: The prevalence of health anxiety among undergraduate students was observed to be 7.7%. Significantly higher total SHAI scores were observed in medical students compared to non-medical students (p-value = 0.022). MBBS 6th semester students exhibited significantly higher total scores compared to MBBS interns (p = 0.003). Further analysis revealed significant differences in health anxiety related to several personal and familial factors.

Conclusions: Medical students exhibited higher levels of health anxiety, particularly in their early years of clinical exposure compared to non-medical students. Health anxiety was influenced by various personal and familial factors.

Keywords: Health anxiety, medical student syndrome, medical student, non-medical student.

INTRODUCTION

Experiencing health-related thoughts and concerns is a common experience for many individuals, as physical well-being is crucial for a high quality of life. However, in some cases, intense health concerns (health anxiety) develop in the absence of organic pathology, where individuals perceive themselves as seriously ill due to a misinterpretation of benign bodily sensations. Health anxiety exists on a continuum and, in its severe form, is associated with functional impairment, considerable suffering, and significant costs for both healthcare

providers and society at large. The prototypical diagnosis associated with health anxiety was once hypochondriasis, but in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)¹, it has been replaced by somatic symptom disorder and illness anxiety disorder.

Health anxiety tends to be more prevalent among medical students compared to students in other fields², as they tend to attribute their benign symptoms to the illness they are studying during their medical training, leading to undue anxiety about their health^{3,4}. This phenomenon is often referred to in the literature as “medical student syndrome (MSS)” or “medical student disease”⁵. In a review conducted by Dr. Brian Hodges, the term “medical student syndrome” was first reported in the 1960s². In the 1960s, two small and uncontrolled studies reported a prevalence of the condition between 70 to 80% among medical students^{3,6}. Some analytical epidemiological studies that included comparison groups showed an increased risk of health anxiety among health science students^{7,8}, while others found no association between the field of study and the prevalence of health anxiety^{9,10,11}. In fact, some studies reported higher levels of health anxiety in non-medical students compared to their medical counterparts^{12,13}. Health-related anxiety tends to be more common in the early years of medical training and decreases as students gain knowledge with clinical exposure over time^{7,14,15}. This may explain the lower prevalence of health anxiety observed in a few studies involving final-year students.

There are relatively few studies in India that have investigated health anxiety among medical students and assessed the impact of clinical exposure on health anxiety during medical training. Comparative studies of health anxiety between medical and non-medical students in India are also scarce. Therefore, it is worthwhile to explore health anxiety among both medical and non-medical students and make comparisons. Additionally, an effort was undertaken to discern the diverse personal and familial factors influencing health anxiety.

MATERIALS AND METHODS

This cross-sectional descriptive study took place over two months in September and October 2022, within the state of Andhra Pradesh, focusing on specific student populations. The participants include final MBBS part I undergraduate medical students (in their 6th semester), MBBS Intern students from NRI Medical College in Chinakakani, and 3rd and 4th year B. Tech students from VR Siddhartha Engineering College in Vijayawada (with an annual intake of approximately 1100 B. Tech students). For the medical student groups, all available and willing participants were included, comprising 137 6th-semester students out of 187 and 63 intern students out of 137. Students who were inaccessible after two direct attempts, both in the classroom and via phone, were excluded from the study. 61.7% of medical students responded. To ensure a balanced comparison, an equal number of B. Tech students (100 each from both 3rd and 4th years) from various branches were selected using stratified random sampling according to population proportion to the size.

This research commenced after obtaining ethical approval from the Institutional Ethical Committee. Informed consent was acquired from each student before data collection. Prior permission was also secured from the heads of the respective institutions to conduct the

data collection. Each student completed a pre-validated self-administered questionnaire. The questionnaire covered general information about the students, including their age, gender and year of study. It also included the short form of the health anxiety inventory (SHAI) and additional inquiries related to the personal history of psychiatric and medical illnesses, family history of psychiatric and medical illnesses, as well as the presence of medical professionals within the family.

SHAI¹⁶, a shorter version of the original health anxiety inventory, comprises 18 items. It has two components: (1) Illness likelihood (Main section): This component, encompassing items 1 to 14, measures an individual's perceived likelihood of developing a serious illness. (2) Negative consequences: Items 15 to 18 pertain to the perceived negative consequences of falling seriously ill. Each item within the scale provides respondents with four response options (a to d), corresponding to scores ranging from 0 to 3. In the event of multiple options being endorsed, the highest score is considered. The presence of significant health anxiety is denoted by a score of 18 or higher in the main section of the scale. Additionally, the questionnaire gathers information on specific diseases students fear developing and the sources of reassurance they utilize to alleviate their anxieties. No personal identifiers were included in the questionnaire. So that participants can respond to the questionnaire of their own free will and without the worry of being identified and judged based on their responses.

The data analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 22. Descriptive statistics, including frequencies, percentages, mean, and standard deviation were used to provide a clear summary of the dataset. To compare the mean SHAI scores between different groups, an independent samples 't' test was applied. To compare the mean ranks of individual items within the SHAI scale between medical and non-medical students, the Mann-Whitney U-test was utilized. The chi-square test was used to compare the distribution of categorical variables among the groups. Findings were considered statistically significant when the p-value was 0.05 or lower.

RESULTS

The present study was carried out among 400 undergraduate students of which 200 were medical students and 200 were non-medical students (pursuing engineering). Out of 200 medical students, 137 belonged to MBBS 6th semester, and 63 were intern students. Gender-wise, we observed an almost even split, with 46.5% male students and 53.5% female students. The mean age of the participants stood at 20.79 ± 1.34 years. A small but noteworthy 6.5% of the students reported a personal history of psychiatric illness and 20% of the participants disclosed a personal history of medical illness. Exploring this matter further, notably, 10% of medical students disclosed a personal history of psychiatric illness, whereas only 3% of their non-medical counterparts reported such experiences. These findings carried statistical significance with a χ^2 value of 8.063 and a p-value of 0.005. Within the medical group, between 6th-semester students (12.4% or 17 out of 137) and interns (4.8% or 3 out of 63), there was no statistically significant difference in the presence of a personal history of psychiatric illness (χ^2 value = 2.804, p-value = 0.094). Study groupwise distribution showed

personal history of medical illness among 22.5% of medical students and 17.5% of non-medical students.

When enquired about family history, 7.2% of the participants reported a family history of psychiatric illness, while a more substantial 30.2% mentioned a family history of medical illness. On further analysis, for medical students, 9% had a family history of psychiatric illness, compared to 5.5% among non-medical students. Family history of medical illness was higher among medical students, with 36.5% reporting such histories compared to 24% among non-medical students. A total of 26.2% of the undergraduate students had at least one medical professional in the family. Among medical students, this figure stood at 30%, while among their non-medical counterparts, 22.5% had one or more family members as medical professionals. Using the Short Health Anxiety Inventory (SHAI), our assessment revealed that 7.7% of the study participants were found to be having health anxiety. Study GroupWise distribution showed that 8% of the medical students and 7.5% of the non-medical students were having health anxiety. For further insight into this, we calculated the mean main item score and mean negative consequences score of the SHAI among undergraduate students, which came out to be 9.96 ± 5.78 and 1.89 ± 2.04 , respectively. The overall mean total score was 11.85 ± 7.14 .

Independent samples t-test was employed to uncover any significant differences in SHAI scores based on the participant's professional groups and other characteristics. Notably, medical students had significantly higher total SHAI scores compared to non-medical students (p -value = 0.022), while MBBS 6th semester students also demonstrated significantly higher total scores compared to MBBS interns (p = 0.003). Other characteristics that showed statistically significant differences for total SHAI score were personal history of psychiatric illness, personal history of medical illness, family history of psychiatric illness, family history of medical illness and presence of medical professionals in the family (p < 0.05) as outlined in Table 1. For the main item score, medical students exhibited significantly higher scores in comparison to non-medical students (p = 0.005), and MBBS 6th semester students surpassed intern students with a statistically significant difference (p = 0.002). Personal history of psychiatric illness, personal history of medical illness, family history of psychiatric illness, family history of medical illness, and the presence of medical professionals in the family all showed statistically significant differences in the main item score (p < 0.05), as outlined in Table 1. However, no significant differences in negative consequences scores were observed when examining the participant's professional groups. Instead, significant differences in negative consequences scores were observed with personal history of psychiatric illness and family history of psychiatric illness (p < 0.05), as summarized in Table 1. Further insights into the individual item scores of SHAI and the results of the Mann-Whitney U-test between medical and non-medical students can be found in Table 2.

Among undergraduate students, the foremost disease-related worry was diabetes, a concern shared by 39% of the students. It was closely followed by the apprehension of cancer at 34.5%, heart disease at 32.5%, and hypertension at 31.5%. A list of other diseases that invoked fear among the students and the proportions of medical and non-medical students

with specific disease-related fears were outlined in Table 3. When students grappled with health-related fears, the majority sought reassurance from family (57.5%) and friends (55%). Other reassurance sources utilized by students are detailed in Table 4. In the past 6 months, 25.3% (101) of the students consulted a doctor due to their fears regarding diseases or medical conditions. Among them, 20.8% (83) consulted more than one doctor for the same medical concern. A slightly higher percentage of students with health anxiety (11 out of 31 i.e., 35.5%) visited a doctor during the last 6 months due to their health-related fears compared to students without health anxiety (90 out of 369 i.e., 24.4%). However, this difference was not statistically significant (chi-square value: 1.865; p-value: 0.172).

Table 1: Comparative analysis of SHAI scores based on basic characteristics of study participants using independent samples t-test

Basic characteristics	Category	Total score	p-value	Main item score	p-value	Negative consequences score	p-value
Gender	Male (186)	11.65 ± 7.832	0.612	9.63 ± 6.233	0.286	2.02 ± 2.148	0.213
	Female (214)	12.01 ± 6.501		10.25 ± 5.348		1.77 ± 1.946	
Professional group	Medical (200)	12.67 ± 6.196	0.022	10.76 ± 5.109	0.005	1.91 ± 1.801	0.845
	Non-medical (200)	11.03 ± 7.911		9.16 ± 6.287		1.87 ± 2.265	
Medical professional year	6 th semester (137)	13.53 ± 6.163	0.003	11.52 ± 5.134	0.002	2.01 ± 1.839	0.205
	Interns (63)	10.78 ± 5.884		9.11 ± 4.684		1.67 ± 1.704	
Personal history of psychiatric illness	Present (26)	15.31 ± 7.562	0.010	12.58 ± 6.848	0.017	2.73 ± 1.991	0.029
	Absent (374)	11.60 ± 7.061		9.78 ± 5.661		1.83 ± 2.037	
Personal history of medical illness	Present (80)	13.64 ± 6.918	0.012	11.59 ± 5.813	0.005	2.05 ± 1.942	0.420
	Absent (320)	11.40 ± 7.140		9.55 ± 5.705		1.84 ± 2.069	
Family history of psychiatric illness	Present (29)	15.66 ± 8.985	0.003	12.48 ± 7.628	0.014	3.17 ± 2.406	0.0001
	Absent (371)	11.55 ± 6.906		9.76 ± 5.572		1.78 ± 1.982	
Family history of medical illness	Present (121)	13.21 ± 6.166	0.012	11.10 ± 4.942	0.009	2.11 ± 1.905	0.152
	Absent (279)	11.25 ± 7.462		9.47 ± 6.046		1.79 ± 2.097	
Presence of medical professionals in the family	Yes (105)	13.08 ± 7.430	0.040	11.14 ± 6.093	0.014	1.93 ± 2.072	0.778
	No (295)	11.41 ± 7.000		9.54 ± 5.611		1.87 ± 2.037	

Table 2: Comparison of individual items of SHAI between medical and non-medical students using Mann-Whitney U-test

Items in SHAI	Mean rank		U	p-value
	Medical students (n=200)	Non-medical students (n=200)		
1. Worry about health	215.86	185.14	16928	< 0.001
2. Aches/pains	210.69	190.31	17962.500	0.058
3. Bodily sensations	218.19	182.82	16463	0.001
4. Thoughts of illness	208.38	192.62	18423.500	0.142
5. Afraid that of having a serious illness	205.04	195.96	19092.500	0.379
6. Images of being ill	206.96	194.04	18708	0.172
7. Taking mind off thoughts about health	201.47	199.54	19807	0.847

8. Relief if doctor tells there is nothing to worry	212.79	188.21	17542	0.010
9. If I hear about an illness I think I have it myself	217.67	183.34	16567	0.001
10. Wondering about bodily sensation or change	211.54	189.47	17793	0.040
11. Feeling of the risk of developing serious illness	215.71	185.29	16958.500	0.004
12. Thinking that of having a serious illness	204.48	196.52	19204	0.428
13. Unexplained bodily sensation & difficult to think about other things,	209.22	191.79	18257	0.091
14. Family/ friends perception about my attitude towards my health	223.22	177.78	15456.500	<.001
15. Serious illness & able to enjoy things in life	213.17	187.83	17466	0.016
16. Serious illness – chance of modern medicine to cure	203.82	197.19	19337	0.499
17. Serious illness would ruin aspects of life	199.29	201.72	19757	0.793
18. Serious illness and feel of loss of dignity	198.42	202.58	19584.500	0.638

Table 3: List of health concerns that undergraduate students fear developing (n=400)

Health concern	Medical students (n=200)	Non-medical students (n=200)	Total undergraduate students (n=400)
Diabetes	104 (52%)	52 (26%)	156 (39%)
Hypertension	82 (41%)	44 (22%)	126 (31.5%)
Cancer	83 (41.5%)	55 (27.5%)	138 (34.5%)
Heart disease	87 (43.5%)	43 (21.5%)	130 (32.5%)
Neurological disorder	51 (25.5%)	33 (16.5%)	84 (21%)
HIV	36 (18%)	23 (11.5%)	59 (14.8%)
COVID 19	24 (12%)	43 (21.5%)	67 (16.8%)
Psychiatric disorders	59 (29.5%)	37 (18.5%)	96 (24%)
Complications of already existing disease	24 (12%)	15 (7.5%)	39 (9.8%)
Others	13 (6.5%)	4 (2%)	17 (4.3%)

Note: Multiple responses were reported

Table 4: Reassurance sources utilized by undergraduate students to alleviate health-related fears (n=400)

Reassurance sources used	Medical students (n=200)	Non-medical students (n=200)	Total undergraduate students (n=400)
Friend	119 (59.5%)	101 (50.5%)	220 (55%)
Family	131 (65.5%)	99 (49.5%)	230 (57.5%)
Reading books	35 (17.5%)	24 (12%)	59 (14.8%)
Internet	62 (31%)	62 (31%)	124 (31%)
Checking body for changes	55 (27.5%)	20 (10%)	75 (18.8%)
Doctor	109 (54.5%)	65 (32.5%)	174 (43.5%)
Nurses	10 (5%)	10 (5%)	20 (5%)
Others	4 (2%)	7 (3.5%)	11 (2.8%)

Note: Multiple responses were reported

DISCUSSION

This current observational study was conducted to estimate the prevalence of health anxiety within the undergraduate student population, drawing distinctions between medical and non-medical students. To assess this health anxiety, the Short form of Health Anxiety Inventory (SHAI) was used designating those with a main item score of 18 or higher as experiencing health anxiety. In the present study, health anxiety had an overall prevalence of 7.7% among undergraduate students. The proportion of medical and non-medical students experiencing health anxiety amounted to 8% and 7.5%, respectively. Samiyah Siraj Althagaf et al.'s⁸ study conducted among female medical and non-medical students showed an overall prevalence of 16.2% health anxiety. It's worth noting that the present study unveils a lower prevalence of health anxiety among medical students compared to earlier research. For instance, a study by Dr Oliver Howes and Dr Paul Salkovskis¹⁰ revealed a notably higher prevalence of "2nd year syndrome" at 70% within the medical student population. Similarly, Rohilla J et al.⁵ observed a higher prevalence of health-related anxiety among medical students (14.77%) in contrast to current study findings. Samiyah Siraj Althagaf et al.'s⁸ study also reported a higher presence of disease-related fears, with 17.4% of medical students expressing these anxieties. Furthermore, Eslami M et al.'s¹⁷ study found that 11.0% of medical students had probable MSS.

In this current study, a significantly higher number of medical students reported psychiatric illness history compared to non-medical students ($p < 0.05$). This discrepancy might be attributed to the academic pressures and the uncertainties surrounding the future that often weigh heavily on medical students. In the realm of health anxiety scores, when independent samples t-test was applied, medical students exhibited significantly higher total SHAI scores as well as main item scores compared to non-medical students. Contradictory findings to the present study were observed by Dr. G. Singh et al.¹² and Katarzyna Szczurek et al.¹³. They found that the health anxiety levels of medical students were lower compared to non-medical students. According to Samiyah Siraj Althagaf et al.'s⁸ study fears related to the disease were higher among medical students (17.4%) than nonmedical students (15%), but did not reach significant levels.

Constant exposure of medical students to a plethora of symptoms and signs associated with various diseases during their study period, particularly in their early years of clinical exposure, might lead them to misinterpret non-significant symptoms as potential indicators of these diseases, thereby triggering groundless fears. In the present study, total SHAI scores and main item scores were significantly higher among MBBS 6th semester students than among intern students. This difference might be attributed to the increased clinical exposure that the 6th-semester students receive. With more hands-on experience, they tend to acquire a deeper understanding of diseases and develop the ability to distinguish significant symptoms from benign ones, which in turn, helps them avoid unnecessary health anxiety. These findings align with the results of a study conducted by Samiyah Siraj Althagaf et al.⁸, where Medical Student Syndrome was more prevalent among preclinical students (21.1%) compared to their older counterparts (14%), and the difference was statistically significant ($p < 0.05$). Rohilla J et al.⁵ similarly demonstrated a higher prevalence of health-related anxiety among preclinical

students (16.66%) than clinical students (13.04%), although the difference was not statistically significant.

Characteristics that exhibited statistically significant differences in total SHAI scores in the present study were personal history of psychiatric illness, personal history of medical illness, family history of psychiatric illness, family history of medical illness and presence of medical professionals in the family ($p < 0.05$). Associations with family or personal psychiatric or medical history or having a medical professional in the family did not yield significant results in Rohilla J et al.'s study⁵. Over the past 6 months, it was noticeable that a relatively higher percentage of students with health anxiety visited a doctor due to fears related to diseases or medical conditions, as compared to students without health anxiety, although this difference was not statistically significant (35.5% vs 24.4%). This is quite intuitive, as individuals with more significant health concerns are naturally more inclined to seek medical advice.

CONCLUSIONS

Medical students, especially during their early clinical years, displayed higher levels of health anxiety when compared to non-medical students. Furthermore, the study findings shed light on the intricate interplay of anxiety, personal history, and health-care-seeking behaviours among undergraduate students, providing valuable insights for future research and interventions in promoting mental well-being and health consciousness in this demographic. The college period is the most crucial phase of a student's life. Any obstacles that affect the psychological health in this phase can be detrimental to their future. It is advisable to establish student counselling centres in every college to raise awareness about health anxiety and provide coping strategies. Special attention should be directed towards medical students during their initial clinical years. Incorporating practices like yoga and other recreational activities into educational institutions can help students develop effective coping mechanisms for managing health anxiety. Regular mental health assessments of students can facilitate early diagnosis and timely intervention, ensuring appropriate support measures are implemented.

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