

# Comparative Study of Effect of Stress on Headache in Medical and Non-Medical Students

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## Abstract

**Background-** This study was conducted to compare the effect of stress on headache in medical and non-medical students.

**Method-** In this study, comparisons were made between 200 medical students of S.N.M.C, Agra and 200 non-medical students of Agra College, Agra, aged between 18-21 years, from 1 January 2017 till 30 June 2018. Perceived stress scale was used to determine the prevalence of stress among medical and non-medical students. On the basis of frequency of occurrence of headache, it was categorized as daily, weekly and infrequent.

**Results-** Moderate and high perceived levels of stress were found to be more common in medical students as compared to non-medical students and the result was found to be statistically significant ( $p < 0.0001$ ).

Daily and weekly headaches were commoner in medical students, whereas, infrequent headache was more common in non-medical students and there was statistically significant difference among both groups ( $p < 0.0001$ ).

Among medical students, daily and weekly headaches were more commonly found in high perceived level of stress and infrequent headache was more common in low level of stress and statistically significant difference was found between headache and level of stress among medical students ( $p < 0.0001$ ).

Among non-medical students, daily and weekly headaches were common in high perceived level of stress and infrequent headache was also more common in low level of stress and statistically significant difference was found between headache and level of stress among non-medical students ( $p < 0.0001$ ).

**Conclusion-** Among the medical students, 48% (96) had infrequent headache, 43.5% (87) had weekly episode of headache and 8.5% (17) had daily headache. While among non-medical students 64% (128) had infrequent headache, 35% (70) had weekly episode of headache and 1% (2) had daily headache which was a statistically significant. Stress headaches are more common among the medical students.

**Keywords-** Stress, Headache, Medical students, Non-Medical students.

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## Introduction

Stress is a psycho-physiological homeostatic imbalance which arises when there is an actual or perceived demand capacity mismatch between the individual and his or her environment.<sup>1</sup>

It can be defined as any challenges to homeostasis that require an adaptation response. It is a consequence of a change in the external environment that perturbs the internal milieu. However, it can be a direct result of dysfunction in one or more organ systems within the body's internal environment.<sup>2</sup>

There are three types of stress:

**Acute stress:** It is the most common type of stress. It is the body's immediate reaction to a new challenge, event, demand and it triggers the fight or flight response.

**Episodic acute stress:** When acute stress occurs frequently it is called episodic acute stress.

**Chronic stress:** If acute stress doesn't resolve and begins to increase and lasts for a long period of time, it becomes chronic stress.

Academic stress is a good model of psychological stress in humans and is therefore useful for studying psycho-neuro-hormonal changes in students.<sup>3</sup>

Physiological consequences of these stressors include specific biological and cellular tissue alteration.<sup>4</sup>

There are many physiological alterations that occur in stress like anxiety, depression, tension, headache, altered sleep pattern, altered food habits, bowel habits, and increase consumption of caffeinated drinks.

Academic stress has emerged as a major psychosocial influence on physical and mental health over recent decades.

A student generally faces different kinds of stressors such as vastness of academic syllabus, language problem, frequent examinations, homesickness, high parental expectations, lack of time for recreation and improper quality of food in mess etc.

## **Material and Method**

The present study was conducted in the Department of Physiology, S.N. Medical College, Agra from 1 January 2017 till 30 June 2018. It was a cross-sectional, double blinded study where comparisons were made between randomly selected 200 medical students of S.N. Medical College and 200 non-medical students of Agra College, aged between 18-21 years. Multistage stratified random sampling technique was applied for both medical and non-medical students. To help determine the

degree of stress the participants were experiencing, they were made to fill out a self-assessment questionnaire: Perceived stress scale.

Perceived stress scale (PSS) was originally developed in 1983 and it still remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about feelings and thoughts during the last month.

Headache is one of the most common complaints during medical curriculum and it occurs due to numerous psychological and physical stressors, which are more common in medical students than general population. Frequent and severe headache have a major impact on academic performance and quality of life, and may bring about limitation in daily activities and work. The problem may also influence the student future job performance, causing a large burden for individual and society, considering the role of medical students in improving the community health. On the basis of frequency of occurrence of headache, it was categorized as daily, weekly and infrequent.

The study was conducted in 2 groups –

Group A- Medical students of S.N. Medical College, Agra.

Group B- Non-medical students of Agra College, Agra.

The data collected from all the students was recorded on an MS Excel sheet and subjected to statistical analysis. Chi square test was applied to analyze the data by using SPSS software ( version 20).

### **Inclusion criteria:**

All the medical and non-medical students who were willing to participate in the study after being informed in details about the study.

### **Exclusion criteria:**

Students who were unwilling to participate.

Students having any other systemic disorders, chronic illnesses or any precipitating factors for acute stress.

Students having known pathological diseases of eye.

Permission was sought from the principal of SNMC, Agra and Head of department for accomplishing this research work. Permission was also sought from Agra College's principal and dean for accomplishing this research work to take participation of non-medical students.

## Observation and Result

**Table: 1- Gender wise distribution of all study participants.**

S.No	Gender	Medical students (N=200)		Non-medical students (N=200)	
		n	(%)	n	(%)
1	Male	105	(52.5)	105	(52.5)
2	Female	95	(47.5)	95	(47.5)

Among 200 medical and non-medical students, majority of the participants, 52.5% were male (n=105), while 47.5% were female (n=95) with male to female ratio was 1.1:1 among both groups.

**Table: 2- Level of stress among medical and non-medical students: Perceived Stress Scale**

S.No	Level of Stress	Score	Medical students (N=200)		Non-Medical students (N=200)	
			n	(%)	n	(%)
1	Low (A)	0-13	41	(20.5)	86	(43)
2	Moderate (B)	14-26	136	(68)	104	(52)
3	High perceived (C)	27-40	23	(11.5)	10	(5)
Chi square test =25.33; df =2; p value =<0.0001						

Among 200 medical students, the maximum students had moderate level of stress which included 68% (136) students. 20.5% (41) had low level of stress and 11.5% (23) had high perceived level of stress.

Among the 200 non-medical students, maximum had moderate levels of stress accounting to 52% (104)

followed by 43% (86) with low level of stress and 5% (10) with high perceived level of stress.

Moderate level of stress and high perceived level of stress were more common in medical students as compared to non-medical students. By applying chi square test, statistically significant difference was found between both the groups.

**Table: 3- Headache among Medical and Non-Medical students:**

S.No	Headache	Medical students (N=200)		Non-Medical students (N=200)	
		n	(%)	n	(%)
1	Daily	17	(8.5)	2	(1)
2	Weekly	87	(43.5)	70	(35)
3	Infrequent	96	(48)	128	(64)
Chi square test =18.25; df =2; p value =0.0001					

Among 200 medical students, 48% (96) had infrequent headache, 43.5% (87) had weekly episode of headache and 8.5% (17) had daily headache. While

among non-medical students 64% (128) had infrequent headache, 35% (70) had weekly episodes of headache and 1% (2) had daily headache.

Daily and weekly headaches were more common in medical students (8.5% and 43.5% respectively) as compared to non-medical students (1% and 35% respectively) whereas, infrequent headache was more

common in non-medical students (64%) as compared to medical students (48%). By applying chi square test, statistically significant difference was found among both groups.

**Table: 4-Comparison of level of stress and headache among medical and non-medical students.**

S.No	Level of stress	Headache					
		Medical students (N=200)			Non-medical students (N=200)		
		Daily	weekly	Infrequent	Daily	Weekly	Infrequent
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
1	Low stress (A)	1 (2.43)	7 (17.07)	33 (80.49)	0 (0)	9 (10.47)	77 (89.53)
2	Moderate stress (B)	8 (5.88)	67 (49.26)	61 (44.85)	0 (0)	53 (50.96)	51 (49.04)
3	High perceived stress (C)	8 (34.78)	13 (56.52)	2 (8.7)	2 (20)	8 (80)	0 (0)
		Chi square test =46.78, df=4, p value = <0.0001			Chi square test =91.54, df=4, p value = <0.0001		

Among 200 medical students, daily and weekly headaches were more commonly found in high perceived level of stress (34.78% and 56.52% respectively). Infrequent headache was more commonly found in low level of stress (80.49%).

By applying chi square test, statistically significant difference was found between headache and level of stress among medical students.

Among 200 non-medical students, daily and weekly headaches were common in high perceived level of stress (20% and 80% respectively). Infrequent headache was also more common in low level of stress (89.53%).

By applying chi square test, statistically significant difference was found between headache and level of stress among non-medical students.

## Discussion

In the current study, among the medical students, percentages with low, moderate and high perceived levels of stress were 20.5%, 68% and 11.5%, respectively. Among the non-medical students, percentages were 43%, 52% and 5%, respectively (table 2). When we compare both the groups, moderate level of stress and high perceived level of stress were more commonly

observed in medical students. The cause may be the longer duration of study, greater duration required to complete professional degree, coupled with frequent examinations and high expectations from parents of same background serving as role models, which may culminate into a greater degree of stress among medical students as compared to non-medical students.

Similar study conducted in Department of Community Medicine, Jinnah Medical and Dental College, Karachi, Pakistan stress levels among medical, engineering, arts and commerce students were studied. The results showed that the stress levels of medical students had been found to be significantly higher than those of the other 3 professional colleges<sup>5</sup>.

In a study conducted by Hamza et al, prevalence of stress of all levels was about 63.8% and the prevalence of severe stress was 25.2%. 75.6% of medical students had stress, among which 54.6% had moderate to highly perceived stress<sup>6</sup>.

In current study, among 200 medical students, 48% (96) had infrequent headache, 43.5% (87) had weekly episodes of headache and 8.5% (17) had daily headache. While among non-medical students 64% (128) had infrequent headache, 35 % (70) had weekly episodes of headache and 1% (2) had daily headache. Daily

and weekly headache were more common in medical students, whereas infrequent headaches were more common in non-medical student. (Table 3)

A study conducted in the medical students showed that, the prevalence of tension-type headache was 64.7%, migraine 18.7%, 1.7% had never had headaches and there was no diagnosis in 14.9%. Among the psychology students, the prevalence of tension-type headache was 48.5%, migraine 32% and no diagnosis in 19.4%. The study showed increased tension headaches in medical students which was statistically significant<sup>7</sup>.

In this study, it was observed that in both the groups, daily and weekly headaches were commonly associated with high perceived level of stress, while, infrequent headache was seen in low level of stress (Table 4).

A longitudinal population based study conducted by Schramm SH et al showed the association between stress and headache. This study provides evidence for an association between stress intensity and headache frequency. Higher effects were observed in younger age group<sup>8</sup>.

Many studies have found that stress can contribute to headaches, a condition characterized by pain in the head or neck regions. One study of 267 people with chronic headaches found that a stressful event preceded the development of chronic headaches in about 45% of cases<sup>9</sup>. A larger study showed that increased stress intensity was associated with an increase in the number of headache days experienced per month (32). Another study surveyed 150 military service members at a headache clinic, finding that 67% reported their headaches were triggered by stress, making it the second most common headache trigger<sup>10</sup>.

### Conclusion

Among the medical students, 48% (96) had infrequent headache, 43.5% (87) had weekly episode of headache and 8.5% (17) had daily headache. While among non-medical students 64% (128) had infrequent headache, 35 % (70) had weekly episode of headache and 1% (2) had daily headache which was a statistically significant. Stress headaches are more common among the medical students.

**Conflict of Interest-** None

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**Ethical Clearance-** Taken from college ethical committee.

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