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COMPARATIVE ANALYSIS ON STRESS LEVEL AMONG THE MEDICAL AND ENGINEERING STUDENTS IN CHENNAI CITY, TAMILNADU-A CROSS-SECTIONAL STUDY

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ABSTRACT: Background: Stress is an important factor determining the mental health of the individual. During this pandemic, a student's life has had a questionable influence in academics since an online platform was created to educate them. This study was done to assess the stress level among medical and engineering students. **Materials and Methods:** A cross-sectional study was conducted to assess the stress level. A 15 close-ended questionnaire was validated before circulating among the students through Google forms to various colleges. Statistical analysis was done using SPSS software version 26.0, Descriptive statistics was done to assess the mean and standard deviation and a chi-square test was done to find an association among the students. The P-value <0.05 was considered to be statistically significant. **Results:** The study was done among the 182 students to assess their stress level. The study results showed that the stress level was found to be almost same among the medical and engineering students, whereas while assessing the online platform to conduct academic classes, it was shown that almost all the students were comfortable gaining knowledge through online platform. **Conclusion:** The study shows that the stress level during the pandemic is found to be similar among the engineering and medical students, which showed that during the pandemic, all have influenced the similar level of stress irrespective of medical and engineering students.

INTRODUCTION: Pandemics are events that occur quickly without any warning or signs; Covid-19 is a pandemic that has spread rapidly, affecting a million people overall the globe ^{1,2}.

The stress level and mental health go hand in hand. Stress and mental health impede academic success in the student's carrier. Stress will affect the overall mental health of the students.

This Covid-19 pandemic has changed the lives of so many students ^{3,4}. The mental illness affects the motivation, social interaction, and stress affects not only the students who are undergoing stress but will affect the overall family members. According to the annual report of Centre for Collegiate Mental Health, it has clearly shown that stress is a factor

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that affects the students' mental illness, and 62.7% of the students were under mental illness^{5, 6}. Covid-19 has brought into focus the various stress-related issues faced among the students. Despite the workload, all schoolchildren carry out, its proven that college students handle more peer pressure and serious mental and physical health issues than school students^{7,8}.

Today in this modern era, the spread of Covid-19 has affected the lives of so many youngsters with a difficulty to even pay their fees. The financial crisis has affected the student's mental health status, which intake increases their stress level and negatively impacts overall health^{9,10}. The students' insight is still questionable since it might make the students feel so stressed attending online class by using their mobile phones, which can cause instability in their mental health. Previous studies have stated that academic performance declined during the Covid-19 pandemic than in the earlier years. The study's main objective is to assess the stress level based on a questionnaire among medical and engineering students.

MATERIALS AND METHOD: A cross-sectional study was conducted among engineering and medical college students across Tamil Nadu to assess the stress level during the Covid-19 pandemic. The institutional review board gave ethical clearance approval with the approval number SRMU/M & HS/SRMDC/2019/S/006. The sampling technique carried was the multistage sampling technique. The population all across Tamil Nadu was selected. From the various district of Tamil Nadu, Chennai was selected, and from Chennai two colleges, 1 from medical and one from engineering, was selected.

The participants were selected according to the inclusion and exclusion criteria. The sample size was calculated using G* power; a study done by Sabari *et al* in 2017 was taken as the parent article for sample size calculation. The alpha error was 0.05 and the power (1- β err prob) - 0.95. The final sample size was obtained as 182, Informed consent (bilingual) was obtained from the participants who were chosen based on inclusion criteria. The questionnaire was a closed-ended model consisting of 15 questions. They were explained the purpose and procedure of the study and assured that their participation in the study was entirely voluntary and that they can withdraw from the study at any stage. They were also informed that the data collected will be kept confidential and will be used only for research purposes. Statistical analyses were performed using SPSS software version 26.0. Descriptive statistics were performed to analyse the frequency and percentage distribution. Inferential statistics was performed to know the difference among the stress level among the medical and engineering college students.

RESULTS: **Table 1** shows the descriptive statistics on stress perception among the study participants included in the study. Among the study participants, nearly 2.7% of the individuals were not comfortable using online platforms, whereas 28% were comfortable using the online platform during the Covid-19 pandemic. While assessing students' academic performance during a pandemic, nearly 2.2% of students were never involved, whereas 37.9% had sometimes involved in academics. While assessing the health-related questions, nearly 51.1% had eye problems due to online class and 62.1% felt very tired from attending online classes.

TABLE 1: DESCRIPTIVE STATISTICS ON STRESS PERCEPTION AMONG THE STUDY PARTICIPANTS

S. no.	Questionnaire	Options	Frequency (N-182)	Percentage (%)
1.	During the pandemic, how comfortable are you in using an online platform for academic purposes?	Never	5	2.7
		Occasionally	16	8.8
		Sometimes	69	37.9
		Often	41	22.5
		Always	51	28.0
2.	During the pandemic, how do you recognize the risk of infection?	Never	8	4.4
		Occasionally	21	11.5
		Sometimes	45	24.7
		Often	48	26.4
		Always	60	33.0
3.	During the pandemic, how do you recognize your attention in the online classes?	Never	5	2.7
		Occasionally	11	6.0
		Sometimes	66	36.3

		Often	59	32.4
		Always	41	22.5
4.	During the pandemic, how was your academic involvement?	Never	4	2.2
		Occasionally	7	3.8
		Sometimes	69	37.9
		Often	60	33.0
		Always	42	23.1
5.	During the pandemic, how do you identify the relationship with your college professors?	Never	15	8.2
		Occasionally	45	24.7
		Sometimes	63	34.6
		Often	30	16.5
		Always	29	15.9
6.	During the pandemic, how often you found the difficulties of social isolation?	Never	26	14.3
		Occasionally	21	11.5
		Sometimes	54	29.7
		Often	49	26.9
		Always	32	17.6
7.	During the pandemic, how do you discern the online classes in comparison to offline classes?	Never	7	3.8
		Occasionally	14	7.7
		Sometimes	84	46.2
		Often	37	20.3
		Always	40	22.0
8.	During the pandemic, how do you state your mental fitness was good during online classes?	Never	29	15.9
		Occasionally	41	22.5
		Sometimes	51	28.0
		Often	34	18.7
		Always	27	14.8
9.	During the pandemic, how do you concede the versatility of teaching and learning process through online classes?	Never	8	4.4
		Occasionally	24	13.2
		Sometimes	96	52.7
		Often	33	18.1
		Always	21	11.5
10.	During the pandemic, how do you perceive that all your learning demands are met through online classes?	Never	12	6.6
		Occasionally	25	13.7
		Sometimes	89	48.9
		Often	34	18.7
		Always	22	12.1
11.	During the pandemic, have you often got sick?	Yes	47	25.8
		No	97	53.3
		May be	38	20.9
12.	During the pandemic, have you got any eye problems because of online classes?	Yes	93	51.1
		No	43	23.6
		May be	46	25.3
13.	During the pandemic, have you often feel tired by listening to online classes?	Yes	113	62.1
		No	35	19.2
		May be	34	18.7
14.	During the pandemic, is your concentration level during online classes improved?	Yes	48	26.4
		No	93	51.1
		May be	41	22.5
15.	During the pandemic, do you feel a lack of participation, interest, and involvement in academics?	Yes	84	46.2
		No	47	25.8
		May be	51	28.0

TABLE 2: CHI-SQUARE TEST TO FIND ASSOCIATION BETWEEN THE EDUCATIONAL QUALIFICATIONS

S. no.	Questionnaire	Options	Undergraduate	Postgraduate	P-Value
1	During the pandemic, how comfortable are you in using an online platform for academic purposes?	Never	3	2	0.071
		Occasionally	7	9	
		Sometimes	47	22	
		Often	24	17	
		Always	35	16	

2	During the pandemic, how do you recognize the risk of infection?	Never	4	4	0.165
		Occasionally	15	6	
		Sometimes	31	14	
		Often	23	25	
		Always	43	17	
3	During the pandemic, how do you recognize your attention in the online classes?	Never	3	2	0.041*
		Occasionally	5	6	
		Sometimes	47	19	
		Often	34	25	
		Always	27	14	
4	During the pandemic, how was your academic involvement?	Never	3	1	0.048*
		Occasionally	3	4	
		Sometimes	42	27	
		Often	38	22	
		Always	30	12	
5	During the pandemic, how do you identify the relationship with your college professors?	Never	10	5	0.762
		Occasionally	27	18	
		Sometimes	42	21	
		Often	15	15	
		Always	22	7	
6	During the pandemic, how often you found the difficulties of social isolation?	Never	13	13	0.086
		Occasionally	16	5	
		Sometimes	33	21	
		Often	31	18	
		Always	23	9	
7	During the pandemic, how do you discern the online classes in comparison to offline classes?	Never	5	2	0.876
		Occasionally	6	8	
		Sometimes	56	28	
		Often	21	16	
		Always	28	12	
8	During the pandemic, how do you state your mental fitness was good during online classes?	Never	17	12	0.084
		Occasionally	26	15	
		Sometimes	36	15	
		Often	16	18	
		Always	21	6	
9	During the pandemic, how do you concede the versatility of teaching and learning process through online classes?	Never	6	2	0.598
		Occasionally	13	11	
		Sometimes	63	33	
		Often	21	12	
		Always	13	8	
10	During the pandemic, how do you perceive that all your learning demands are met through online classes?	Never	6	6	0.067
		Occasionally	14	11	
		Sometimes	61	28	
		Often	21	13	
		Always	14	8	
11	During the pandemic, have you often got sick?	Yes	31	16	0.954
		No	55	42	
12	During the pandemic, have you got any eye problems because of online classes?	May be	30	8	
		Yes	61	32	0.655
		No	29	14	
		May be	26	20	
13	During the pandemic, have you often felt tired by listening to online classes?	Yes	74	39	0.083
		No	24	11	
		May be	18	16	
14	During the pandemic, is your concentration level during online classes improved?	Yes	30	18	0.098
		No	61	32	
		May be	25	16	
15	During the pandemic, do you feel a lack of participation, interest, and involvement in academics?	Yes	52	32	0.765
		No	35	12	
		May be	29	22	

Table 2 shows the chi-square test to find an association between educational qualifications. The questionnaire was assessed and showed that both undergraduate and postgraduate students had difficulty in the Covid-19 pandemic, and there were no dissimilarities in the difficulties among them. P-value <0.05 was considered to be statistically significant. During the attending online class and

performance in academic-related questions, P-value was found to be <0.05 , which implies a statistically significant difference was found among the undergraduate and postgraduate students. The other questions assessed to know the stress level did not differ among the undergraduate and postgraduate students.

TABLE 3: CHI-SQUARE TEST TO FIND ASSOCIATION BETWEEN THE MEDICAL AND ENGINEERING STUDENTS

S. no.	Questionnaire	Options	Engineering Student	Medical Student	P-Value
1	During the pandemic, how comfortable are you in using an online platform for academic purposes?	Never	3	2	0.041*
		Occasionally	7	9	
		Sometimes	47	22	
		Often	24	17	
		Always	35	16	
2	During the pandemic, how do you recognize the risk of infection?	Never	4	4	0.165
		Occasionally	15	6	
		Sometimes	31	14	
		Often	23	25	
		Always	43	17	
3	During the pandemic, how do you recognize your attention in the online classes?	Never	3	2	0.041*
		Occasionally	5	6	
		Sometimes	47	19	
		Often	34	25	
		Always	27	14	
4	During the pandemic, how was your academic involvement?	Never	3	1	0.048*
		Occasionally	3	4	
		Sometimes	42	27	
		Often	38	22	
		Always	30	12	
5	During the pandemic, how do you identify the relationship with your college professors?	Never	10	5	0.762
		Occasionally	27	18	
		Sometimes	42	21	
		Often	15	15	
		Always	22	7	
6	During the pandemic, how often you found the difficulties of social isolation?	Never	13	13	0.086
		Occasionally	16	5	
		Sometimes	33	21	
		Often	31	18	
		Always	23	9	
7	During the pandemic, how do you discern the online classes in comparison to offline classes?	Never	5	2	0.876
		Occasionally	6	8	
		Sometimes	56	28	
		Often	21	16	
		Always	28	12	
8	During the pandemic, how do you state your mental fitness was good during online classes?	Never	17	12	0.084
		Occasionally	26	15	
		Sometimes	36	15	
		Often	16	18	
		Always	21	6	
9	During the pandemic, how do you concede the versatility of teaching and learning process through online classes?	Never	6	2	0.598
		Occasionally	13	11	
		Sometimes	63	33	
		Often	21	12	
		Always	13	8	
10	During the pandemic, how do you perceive that all your learning demands	Never	6	6	0.067
		Occasionally	14	11	

	are met through online classes?	Sometimes	61	28	
		Often	21	13	
		Always	14	8	
11	During the pandemic, have you often got sick?	Yes	31	16	0.954
		No	55	42	
		May be	30	8	
12	During the pandemic, have you got any eye problems because of online classes?	Yes	61	32	0.655
		No	29	14	
		May be	26	20	
13	During the pandemic, have you often felt tired by listening to online classes?	Yes	74	39	0.083
		No	24	11	
		May be	18	16	
14	During the pandemic, is your concentration level during online classes improved?	Yes	30	18	0.098
		No	61	32	
		May be	25	16	
15	During the pandemic, do you feel a lack of participation, interest, and involvement in academics?	Yes	52	32	0.765
		No	35	12	
		May be	29	22	

Table 3 shows the chi-square test to find an association between the medical and engineering students. The questionnaire assessed the stress level among the engineering and medical students. P-value <0.05 was considered to be statistically significant. The questionnaire related to attending

online classes and performance in academic-related questions P-value was <0.05, implying a statistically significant difference among medical and engineering students. The other questions assessed know the stress level did not differ among the medical and engineering students.

TABLE 4: MEAN DIFFERENCE AMONG THE ENGINEERING AND MEDICAL STUDENTS

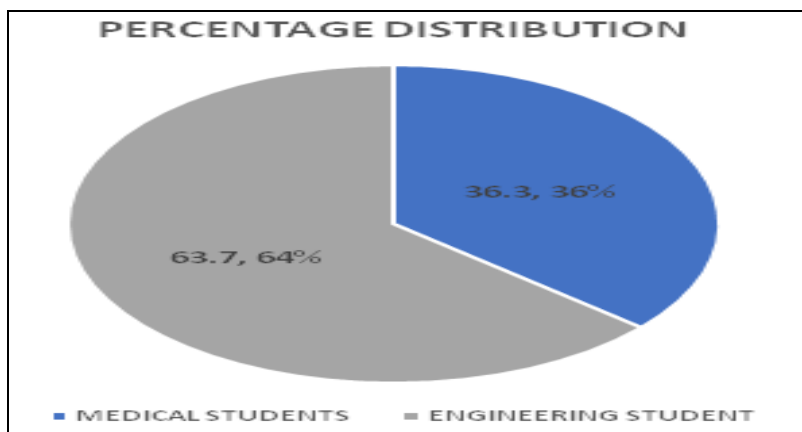
S. no.	Questionnaire	Engineering Students		Medical Students		P-Value
		Mean	Standard Deviation	Mean	Standard Deviation	
1	During the pandemic, how comfortable are you in using an online platform for academic purposes?	1.34	0.4	1.4	0.49	0.740
2	During the pandemic, how do you recognize the risk of infection?	3.6	1.06	3.6	1.08	0.348
3	During the pandemic, how do you recognize your attention in the online classes?	3.7	1.15	3.5	1.21	0.685
4	During the pandemic, how was your academic involvement?	3.6	0.99	3.7	0.94	0.194
5	During the pandemic, how do you identify the relationship with your college professors?	3.6	0.97	3.86	0.81	0.486
6	During the pandemic, how often you found the difficulties of social isolation?	3.03	1.18	3.1	1.15	0.740
7	During the pandemic, how do you discern the online classes in comparison to offline classes?	3.2	1.28	3.2	1.25	0.777
8	During the pandemic, how do you state your mental fitness was good during online classes?	3.4	1.04	3.4	1.03	0.999
9	During the pandemic, how do you concede the versatility of teaching and learning process through online classes?	2.92	1.27	2.9	1.32	0.819
10	During the pandemic, how do you perceive that all your learning demands are met through online classes?	3.20	0.97	3.1	0.92	0.768

Table 4 shows the mean difference among the engineering and medical students. The mean difference showed that the stress level was found to be similar among the engineering and medical students irrespective of their field. P-value <0.05 was considered to be statistically significant. P-

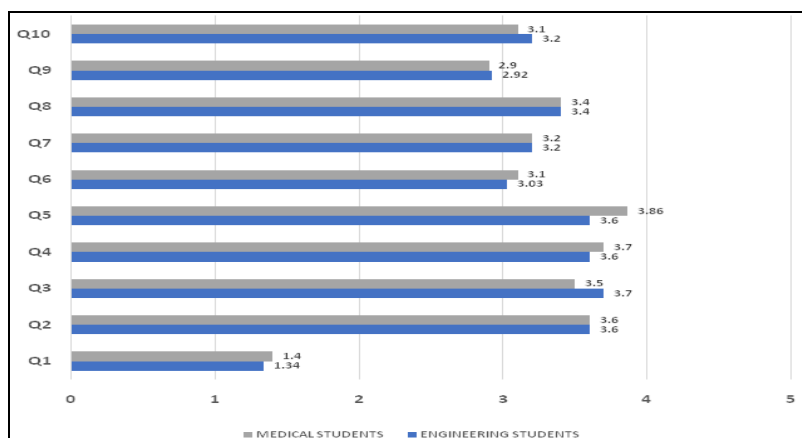
value was found to be >0.05 for all the questionnaires recorded. The mean was found to vary among each questionnaire, with the least mean found for question-related about the students' comfortability towards using an online platform for classes. The mean was found to vary among each

questionnaire, with the least mean found for questions related to the comfort ability of the students towards using an online platform for classes which was following the engineering student's opinion. Graph 2 shows the mean difference of questionnaires recorded among the engineering and medical students. The mean varied

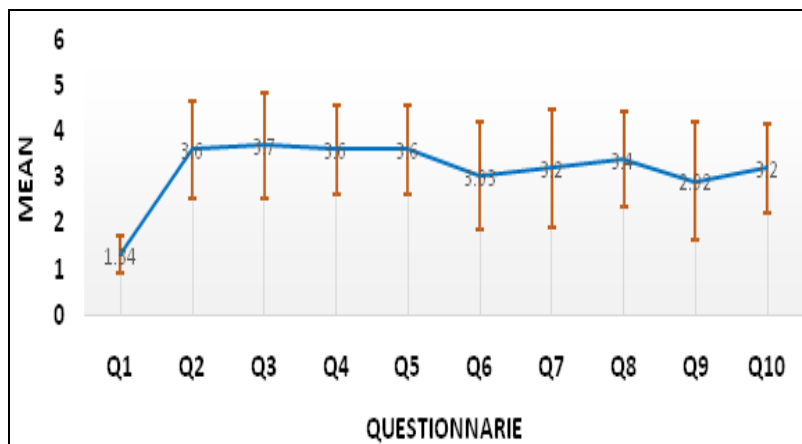
among each questionnaire among the 2 study groups involved. Graph 3 shows the standard deviation difference of the questionnaire recorded among the engineering students. The standard deviation among the questions was assessed, and found that least was found among the students' comfortability while using the online platform.



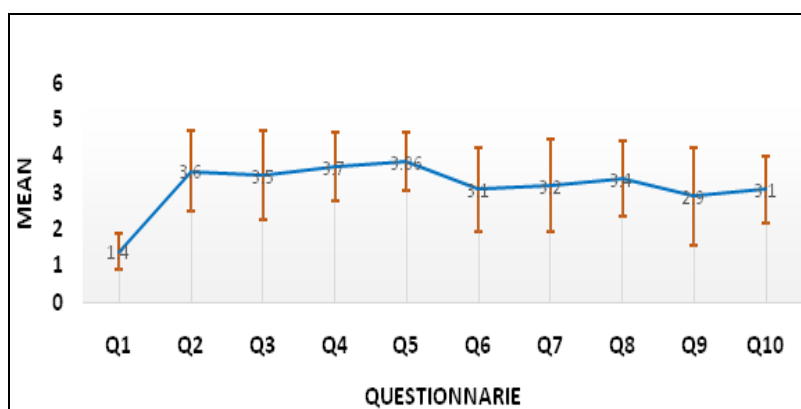
GRAPH 1: SHOWS THE PERCENTAGE DISTRIBUTION AMONG THE STUDY GROUPS AND SHOWS THAT 63.7% ARE MEDICAL STUDENTS WHEREAS 36.3% ARE ENGINEERING STUDENTS



GRAPH 2: MEAN DIFFERENCE OF QUESTIONAIRE RECORDED AMONG THE ENGINEERING AND MEDICAL STUDENTS



GRAPH 3: STANDARD DEVIATION DIFFERENCE OF QUESTIONAIRE RECORDED AMONG THE ENGINEERING STUDENTS



GRAPH 4: STANDARD DEVIATION DIFFERENCE OF QUESTIONNAIRE RECORDED AMONG THE MEDICAL STUDENTS

Graph 4 shows the standard deviation difference of the questionnaire recorded among the medical students. The standard deviation among the questions was assessed, and the lowest was found among the comfort ability the students felt while using the online platform.

DISCUSSION: The spread of Covid-19 still holds a thread among the people in various countries around the globe. The multidisciplinary approach shows that central opinion should be applicable to promote people's health; hence to answer this call, the stress level of students was assessed during the Covid-19 pandemic. Although Covid-19 has started emerging again in various countries with the new variant, still hopes are increasing due to increased vaccination and maintenance of social distancing, and wearing mouth masks would be the primary protocol that helps people fight against the Covid-19^{11, 12}. The continuous spread and occurrence of new variants had influenced the students' mental health, which influenced their studies and concentration level^{13, 14}.

This study was done to assess the stress level of the students in engineering and medical college around Tamil Nadu. The stress perception was almost similar among the students during the Covid-19 pandemic. All had encountered difficulties in academic performance, and many students had difficulty interacting with the staff and improving their academic performance level. Statistically, much difference was assessed among the medical and engineering students. The difficulty in attending the online classes was difficult for the engineering students who live in rural areas, and medical students encountered a serious problem due to a lack of practical training during the Covid-

19 pandemic. The results showed that eye problems is arising hugely during this pandemic among the students and the students felt tired more frequently during the Covid-19 pandemic. The current study results are of significance to stress levels and mental health of college students in the medical and engineering field. The government should take various steps if the lockdown is still prolonged by starting a channel for medical students and engineering students so that classes on important topics can be taught in the government channel via chalk and talk method in which various students in rural areas would get benefited. Communication can be an important step to ensure the students deal with their stress levels. Keeping self-motivation classes during this Covid-19 in every medical and engineering college is advised to help the people overcome their academic crises during the Covid-19 pandemic.

CONCLUSION: The stress level seems to be an important factor affecting the students' mental health. The study showed that stress level among the medical and engineering students was far similar both encountered stress in academic during the Covid-19 pandemic.

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