

A STUDY ON PERCEIVED STRESS AND COPING MECHANISMS AMONG STUDENTS OF A MEDICAL SCHOOL IN SOUTH INDIA

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ABSTRACT

BACKGROUND

The medical course has been identified as being stressful owing to the demands posed by the curriculum, frequent examinations, length of the course, heavy workload and financial concerns. People have a characteristic way of coping with stress based on their personality and they choose appropriate strategies to cope with stressors they confront.

AIM, SETTING & DESIGN

To understand the perceived stress and coping mechanism used by the medical students of a private medical college in south India. Also, to determine the association between different socio-demographic factors and perceived stress levels.

MATERIALS AND METHODS

A cross-sectional study was carried out in a private medical college situated in Kerala. After obtaining informed consent, medical students belonging to the first, third, fifth and seventh semesters were selected randomly by lottery technique. A self-administered questionnaire proposed by John D and Catharine T MacArthur foundation and "Brief COPE" was used to assess the perceived stress levels and coping mechanisms respectively.

STATISTICAL ANALYSIS

The data collected was tabulated using MS Excel and analysed using SPSS 20.0.

RESULTS AND CONCLUSION

It was observed that nearly one third of the medical students were either moderately stressed (14.1%) or suffered from severe stress (15.5%). "Acceptance" was the method that was used a lot by the students. Students were then using active coping, instrumental support, positive reframing and planning as methods in medium amount. Self-distraction, self-blame, religion, use of emotional support, venting and substance use were some of the coping mechanisms that were used a little bit. Some of the coping mechanisms that were least used by students were humour, denial and behavioural disengagement. Therefore, peer counselling through students and faculty may be made accessible to all medical students in order to help them to cope with stress.

KEYWORDS

Stress Disorder, Defence Mechanism, Confront.

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INTRODUCTION: Stress has been defined in many ways,¹⁻⁴ but the most accepted definition states stress as a psychological and physical state that results when resources of the individual are not sufficient to cope with

the demands and pressures of the situation.¹ The term 'stress' was initially used by physicists to describe the force that produces strain on a physical body⁵; its use in the medical field has its genesis in the works of Walter Cannon, who described the 'flight or fight' response; and Hans Selye who is credited to be the first scientist to study the effects of stress on health.⁵⁻⁶

Stress is a natural reaction that is more likely in certain situations and individuals than others. Students both medical and non-medical experience higher levels of stress compared to the general population.⁷⁻⁸ Even among the

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students, stress levels are reportedly higher among the medical students compared to non-medical students.⁹ In India, after completing the higher secondary education, students enter medical school to pursue an undergraduate degree (MBBS) for four & half years followed by one year of internship. The academic program consists of pre-clinical subjects in the first year followed by para-clinical subjects for one & half years. Clinical subjects are taught from the beginning of second year up to final year.

Medical course has been identified as being stressful owing to the demands posed by the curriculum, frequent examinations, length of the course, heavy workload and financial concerns. Sources of stressors in medical education can be grouped into three categories such as academic, social/personal stressors and financial stressors.¹⁰⁻¹¹ Events such as natural calamities, conflicts and political instability in the country have also been identified as stressors.¹²⁻¹³

The consequence of stress on medical students are multitude contributing to both physical and mental illness; ranging from negative effects in learning and cognitive function to poor quality of sleep and substance abuse. Students who are stressed are more likely to have poor decision-making capabilities, deteriorating social relationships, decreased empathy and lower quality of life.¹³⁻¹⁵ Studies suggest that the worsening of mental health continues into the future during post-graduation and in clinical practice which in turn affect patient outcomes.¹⁴

Coping strategies refer to the specific efforts, both behavioural and psychological, that people employ to master, reduce, tolerate or minimise stressful events. A person's response to a stressful situation is influenced by their assessment of that situation; a situation regarded as stressful by one individual, may not be perceived as stressful for another.¹⁶⁻¹⁷ Coping style is an important factor that determines this perception.¹⁸ Coping with stress means using thoughts and actions to deal with stressful situation and lower our stress levels. Generally, coping strategies are either problem focused, emotion-focused and avoidance-focused.¹⁹ People have a characteristic way of coping with stress based on their personality and they choose appropriate strategies to cope with stressors they confront.

With this background, a study on perceived stress and coping mechanism was undertaken among the medical students of a private medical college in South India. The objectives of the study were to assess the level of perceived stress, identify the different coping mechanisms used and also to determine the association between different socio-demographic factors and perceived stress levels.

METHODOLOGY: The cross-sectional study was carried out in a private medical college situated in Kerala, India. After obtaining informed consent, medical students belonging to the first, third, fifth and seventh semesters were selected randomly by lottery technique. Students who were aged between 17-25 years were included in the

study. Those students who were not willing to participate were excluded from the study. High confidentiality was maintained at all stages of the study and the Declaration of Helsinki was followed in this study. The sample size was calculated using the formula $4pq/d^2$, where the prevalence (p) was taken to 44.6% as per a study done by Sharif et al,¹³ $q=55.4\%(100-p)$ and the absolute error $d= 20\%$. Even though the minimum sample size calculated was 124, a total of 290 students were included in the study by simple random sampling.

The study tool was a self-administered questionnaire proposed by John D and Catharine T MacArthur foundation²⁰ to measure perceived stress levels and "Brief COPE"²¹(Brief - Coping with Problems Experienced) was used to assess the coping mechanisms. The questionnaire had three parts consisting of questions regarding socio-demographic profile, measurement of perceived stress levels and coping mechanisms used by the students to overcome stress. Socio-demographic details such as age, sex, semester in which the students were studying, number of siblings, NRI status of students, annual income of the parents, place of residence such as hostel or home, physical activity of students and their mother's working status were collected.

For estimating the level of perceived stress a total of ten questions each with five options such as Never, almost never, sometimes, fairly often and very often were asked. Each of these options was given a score of 0, 1, 2, 3 & 4 respectively. Out of these ten questions, four questions were positively stated; therefore, the scores were reversed on these four questions. Students whose scores were between 31 to 40 were considered to be severely stressed. While those who scored 26 to 30 were moderately stressed and those below 25 were categorised to have mild stress. Therefore, more emphasis has been given to those who fell into the severely and moderately stressed groups. In order, to assess the varying coping strategies used by students in response to stress, Brief COPE consisting of 28 questions focusing on 14 different methods of coping mechanisms such as active Coping, Planning, Positive Reframing, Acceptance, Humour, Religion, etc were used. The students were asked to rate these items on a 4-point Likert scale, ranging from 1 "I haven't been doing this at all" to 4 "I've been doing this a lot". Each of the 14 scales comprised of 2 items and the total scores on each scale ranged from 2 (minimum) to 8 (maximum). Higher scores indicate increased utilisation of that specific coping strategy. Since, there is no overall total score, only total scores for each of the scales were calculated by summing the appropriate items for each scale. Reverse scoring was not required for any of the items.

The data collected was tabulated using MS Excel and analysed using SPSS 20.0. Descriptive statistics such as frequency, percentage and mean was used to summarise the data. Perceived stress levels were classified as mild, moderate and severe. Statistical significance of association between stress and dependent variables was assessed using chi-square tests.

RESULTS:

Socio-demographic Profile: Majority of the participants were females (58.3%) and were in the age group of 17-19 years (55.1%). Most of them belonged to the first semester (31%) and were staying in the hostel (91.7%). Only a minority (32.4%) of the students were Non-resident Indians (NRIs) and had parents who had an annual income of less than rupees five lakhs (17.2%). It was also observed that majority of the students had mothers who were not working (52.4%) and had at least one sibling (69.3%). Our study also revealed that 53.4% of the students engaged themselves in some sort of physical activity like outdoor games, yoga, exercises, etc on a regular basis. The details of the socio-demographic profile are provided in Table No.1.

Socio demographic Profile	Percentage (%)
Age	
17-19	55.1
20-25	44.9
Sex	
Male	41.7
Female	58.3
Semester	
First	31
Third	28.3
Fifth	15.9
Seventh	24.8
Place of residence	
Hostel	91.7
Home	8.3
Physical Activity	
Yes	53.4
No	46.6
NRI Status of students	
Non Resident Indians	32.4
Resident Indians	67.6
Annual Income of the parents(Indian Rupees)	
< 5 lakhs	17.2
5 – 10 lakhs	30.7
10 – 15 lakhs	24.1
> 15 lakhs	17.9
Mother’s working status	
Yes	47.6
No	52.4
Students having siblings	
Nil	17.9
One sibling	69.3
Two siblings	12.1
Three siblings	0.7

Table 1: Distribution of Students According to their Socio-Demographic Profile

Assessment of Level of Perceived Stress among Students: The levels of perceived stress among students were assessed using a scale developed by John D and Catherine T MacArthur Foundation. Using this scale, this

study was able to assess the stress levels as perceived by students while dealing with various day-to-day life circumstances such as occurrence of unexpected happenings, situations that make them feel nervous, handling of personal problems, inability to control important things in their life, coping with their routine activities, controlling irritating situations in life, piling up of difficulties and inability to overcome them. This scale enabled us to categorise students into three categories such as severely stressed (score of 31 to 40), moderately stressed (score of 26 to 30) and mildly stressed (score below 25). There was no category for “no stress”; therefore, each of the students had to fall into either of the mild, moderate or severe stress categories. Our study was able to observe that nearly one third of the medical students were either moderately stressed (14.1%) or suffered from severe stress (15.5%). The details of the perceived stress levels of the students are provided in Table No.2.

Perceived stress levels	Frequency	Percentage
Mild	204	70.3
Moderate	41	14.1
Severe	45	15.5
Total	290	100

Table 2: Distribution of Students According to their Perceived Stress Levels

This study was also able to reveal that there are many factors that are associated with the occurrence of stress among students. It was observed that, 82.7% of the severely stressed students were females when compared to boys and this finding was found to be statistically significant (p value = 0.002). Even though, 35.6% of the severely stressed students were from the 7th semester and 29.3% of the moderately stressed students were from the 3rd and 1st semester, it was found not to be statistically significant (p value = 0.385). Similarly, even though 84.4% and 95.6% of the severely stressed students were non-NRIs and hostelites respectively; no statistical association was found to exist when compared to NRIs and day scholars, (p = 0.071). Our study was also able to generate more evidence to the fact that physical activity played a major role in the management of stress, since 80% of the severely stressed students did not indulge in any form of physical activity while only 20% of those severely stressed were doing regular physical activity and this was found to be statistically significant (p = 0.001). A significant association (p=0.001) was also found between the working status of mothers and stress among students and it was found that mothers of 84.4% of the severely stressed students were working compared to only 15.6% who were not working. However, there was no significant association with regard to the number of siblings that one have and stress (p = 0.118). It was also interesting to note that students who belonged to middle income category, parents of 48.9% severely stressed students earned an annual

income of Rupees 5 to 10 lakhs annually, and stress levels and income was found to be statistically significant ($p = 0.007$). The details of the association between different

socio-demographic factors and perceived stress levels of the students are provided in Table No.3.

Socio-demographic factors	Perceived Stress Levels			Chi-square P value
	Mild	Moderate	Severe	
Sex				
Female	110 (53.9%)	22 (53.7%)	37 (82.2%)	$\chi^2 = 12.56$ P = 0.002
Male	94 (46.1%)	19 (46.3%)	8 (17.8%)	
Semester				
First	69 (33.8%)	12 (29.3%)	9 (20%)	$\chi^2 = 6.347$ P = 0.385
Third	55 (27%)	12 (29.3%)	15 (33.3%)	
Fifth	33 (16.2%)	8 (19.5%)	5 (11.1%)	
Seventh	47 (23%)	9 (22%)	16 (35.6%)	
Place of residence				
Hostel	189 (92.6%)	34 (82.9%)	43 (95.6%)	$\chi^2 = 5.279$ P = 0.071
Home	15 (7.4%)	7 (17.1%)	2 (4.4%)	
Physical Activity				
Yes	126 (61.8%)	20 (48.8%)	9 (20%)	$\chi^2 = 26.26$ P = 0.001
No	78 (38.2%)	21 (51.2%)	36 (80%)	
NRI Status of students				
Non Resident Indians	76 (37.3%)	11 (26.8%)	7 (15.6%)	$\chi^2 = 8.604$ P = 0.014
Resident Indians	128 (62.7%)	30 (73.2%)	38 (84.4%)	
Annual Income of the parents(Indian Rupees)				
< 5 lakhs	34 (16.7%)	4 (9.8%)	12 (26.7%)	$\chi^2 = 17.652$ P = 0.007
5 – 10 lakhs	55 (27%)	12 (29.3%)	22 (48.9%)	
10 – 15 lakhs	53 (26%)	11 (26.8%)	6 (13.3%)	
> 15 lakhs	62 (30.4%)	14 (34.1%)	5 (11.1%)	
Mother's working status				
Yes	76 (37.3%)	24 (58.5%)	38 (84.4%)	$\chi^2 = 35.212$ P = 0.001
No	128 (62.7%)	17 (41.5%)	7 (15.6%)	
Students having siblings				
Yes	32 (15.7%)	12 (29.3%)	8 (17.8%)	$\chi^2 = 4.280$ P = 0.118
No	172 (84.3%)	11 (26.8%)	29 (70.7%)	

Table 3: Association of Different Socio-Demographic Factors with Perceived Stress Levels

Assessment of Coping Mechanisms among Students:

Using the Brief COPE scale, the various coping mechanisms used by students at the time of stress was analysed. It was observed that, "acceptance" was the method that was used a lot by the students. They were accepting the reality of the fact that has happened and were learning to live with it. Students were then using the methods of active coping, instrumental support, positive reframing and planning as methods in medium amount. Self-distraction, self-blame, religion, use of emotional support, venting and substance abuse were some of the coping mechanisms that were used a little bit. Some of the coping mechanisms that were least used by students were humour, denial and behavioural disengagement. However, students suffering from moderate and high stress were using "positive reframing" as the main coping mechanism (High stress mean= 6.04±1.68, Moderate stress = 5.38±1.84) and this was found to be statistically significant ($p = 0.01$).

Interestingly, in our study, while comparing the means of coping mechanisms between males and females, we observed that females use positive reframing ($p=0.00$), acceptance ($p = 0.02$) and religion ($p=0.00$) as their method of coping with stress. Use of emotional ($p= 0.002$) and instrumental support ($p=0.001$) was also seen more among females and they also knew how to cope with stress by denying the fact that such a situation existed ($p=0.013$). While, males turned to substance abuse to cope up with stress than females ($p=0.013$) and all these findings were found to be statistically significant. The details are provided in Table No.4.

Coping Mechanisms	Mean		P value
	Female	Male	
Self-distraction	5.01	4.77	0.21
Active coping	5.34	5.36	0.91
Denial	3.71	3.26	0.019
Substance Use	2.27	2.57	0.013

Use of emotional support	5.08	4.47	0.002
Use of Instrumental support	5.24	4.53	0.001
Behavioural disengagement	3.85	3.70	0.47
Venting	4.28	4.19	0.64
Positive reframing	5.82	5.00	0.00
Planning	5.58	5.48	0.59
Humour	4.41	4.46	0.83
Acceptance	5.89	5.26	0.02
Religion	5.17	4.19	0.00
Self-Blame	4.38	4.36	0.91

Table 4: Comparison between the Means of Coping Mechanisms among Females and Males

On comparing the means of coping mechanisms used by highly stressed females and males, it was observed that self-distraction (p=0.03), venting (p=0.01), behavioural disengagement (p=0.01), use of emotional support (p=0.03) and planning (p=0.01) were found to be used more by females than males and this was found to be statistically significant. It was also observed that, the above mentioned coping mechanisms were not used by the moderately and less stressed group of students. Thereby, showing the fact these coping mechanisms seem to fail resulting in the highly stressed students to remain stressed. The details of which are given in Table No.5.

Coping Mechanisms	Mean		P value
	Female	Male	
Self-distraction	6.27	4.85	0.03
Active coping	4.86	4.75	0.87
Denial	5.51	4.88	0.35
Substance Use	6.07	5.00	0.07
Use of emotional support	4.40	2.88	0.03
Use of Instrumental support	3.65	2.62	0.10
Behavioural disengagement	5.05	3.25	0.01
Venting	5.08	3.25	0.01
Positive reframing	2.35	2.50	0.69
Planning	3.54	2.38	0.01
Humour	5.60	5.37	0.72
Acceptance	5.19	4.00	0.09
Religion	5.32	2.06	0.11
Self-Blame	4.00	3.37	0.35

Table 5: Comparison between the Means of Coping Mechanisms among Females and Males who are Highly Stressed

DISCUSSION: While stress can be considered as a necessary evil in a student's life, higher levels of stress can become a matter of concern as they can have adverse effects on the student. Stress among medical students is a

worldwide phenomenon as evidenced by studies done around the globe.⁸⁻¹⁵ But the prevalence ranges from as low as 20.9% in Nepal to as high as 90% in Pakistan.¹⁵ Our study shows that, of the 290 students spread across various semesters, 15.5% were severely stressed and 14.1% were moderately stressed. A similar study done by Sreejith et al in Karnataka showed 19.58% of the students were moderately stressed and 13.74% were severely stressed.¹⁰ Apart from the social, educational and cultural aspects, these inter and intra-country differences may also be due to the use of different inventories in quantifying stress. It may also be due to the fact that stress is mostly self-reported and that being stressed is considered a stigma in certain communities, thus leading to underreporting.

In the present study, levels of severe stress were reported more among female students (82.2%) compared to males (17.2%) and this difference was statistically significant. The finding corroborates with studies done in Gujarat, Pakistan and Saudi Arabia.²⁰⁻²² This gender difference may be due to the fact that female students may be more apprehensive regarding personal issues related to their future, family expectations and emotional problems when compared to their male counterparts.

Stress was found to be the highest among the 7th semester students (35.6%). This may be probably due to the fact that they were assessed a few weeks just before their final exams and this may be a limitation of our study. It was also observed that 3rd semester students (33.3%) were also almost equally stressed as the 7th semester students. A possible stressor could be their first exposure to clinical postings, which makes the students feel insecure in the initial period. A study done by Venkatarao et al in Orissa also shows similar findings of senior students being more stressed than their juniors.²³ However, in the study by Sreejith et al in Karnataka the first year students were found to be stressed the most.¹⁰

It was also seen that there was a significant association between physical activity and stress, since it was observed that majority of the severely stressed students (80%) did not indulge in any physical activity. Hence, this study adds more evidence to the fact that engaging in physical activity helps to relieve stress. Our study also highlighted the fact that presence of a working mother also contributed to increased stress levels among students (84.4%). This could probably be due to the fact that children felt that their mothers were preoccupied with work and were not spending enough time with them for sharing their problems that they faced in their day to day activities.

In this study, higher levels of perceived stress were found to be more among students residing in the college hostel (95.6%) compared to the day scholars (4.4%). A study done by Waghchavare et al in Maharashtra among students of a professional college stated that the levels of stress were higher among students living in hostels as compared to others.⁹ This could probably be due to the fact that they are staying far away from home & being

separated from family. Lack of adjustment to the available hostel facilities such as food, accommodation, roommates and existing rules and regulations of the hostel may also be contributing to their stress.⁹

Our study was also able to highlight how economic status was also a stressor, since, students belonging to the middle income category whose parents were having an annual income of Rupees 5-10 Lakhs (48.9%) and those who were non NRIs (84.4%) suffered from more stress when compared to the rest. This increase in stress may be a result of students trying to match their peers who are NRIs and belonging to a higher economic status.

Previous literatures have also shown that people respond to stressful situations based on how they assess that particular situation. It is also known that perceived stress is dependent on the relationship between the stressor and the task, and also factors such as coping styles, locus of control, and social supports.²⁴ When faced with stress, a person can respond either in a positive way by taking it as a challenge (e.g. studying harder) or in a negative way (e.g. avoidance) when it is viewed as a threat. However, in our study it was interesting to note that majority of the students responded to stress in a positive manner by using acceptance as the most common method of coping mechanism followed by active coping, use of instrumental support, positive reframing and planning. Methods that were sparingly used by students were self-destruction, self-blame, religion, use of emotional support and venting. The coping mechanisms that were least used when compared to the rest were humour, denial, behavioural disengagement and substance use. The distribution of coping strategies of medical students to stress were found to be slightly different from those found in other studies.^{13,18,25} This could be attributed to the difference in the social, cultural, and religious factors that influence the behaviour of an individual.

Analysis by gender showed that females in our study use reframing, religion and acceptance as their method of coping with stress. Also, use of emotional and instrumental support was seen more among females when compared to males. However, it was quite discouraging to observe that males used substance abuse as a coping mechanism. These findings were similar to a study done by Cherkil et al in Kerala.²⁵

We also observed that the coping mechanisms used by the severely stressed students such as self-distraction, use of emotional support, behavioural disengagement, venting and planning were far different from those used by students who were less stressed, pointing out the fact that these methods failed to control stress. Therefore, it is important to provide alternative measures to relieve stress for these students such as yoga and meditation.

It has been observed that individuals who have access to psychological support when under stress seem to be in better health compared with individuals without significant support.^{24,26} Therefore, it is advisable to have psychological consultations made accessible to all students of all medical colleges in order to help students face their individual

stressors in a healthy way. Peer counselling through students and faculty may be encouraged for the same. It is also recommended that those involved in the formulation of medical education curriculum should focus upon measures that significantly reduce the academic stressors and thereby making the curriculum more student friendly.

CONCLUSION: Our study came to the conclusion that nearly one third of the students suffered from severe & moderate levels of stress. They used several different mechanisms for coping with stress, with some being successful and the rest not. Therefore, the need of the hour has now become the development of a more student friendly curriculum and formation of peer counselling groups in all medical colleges.

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