

Resilience and Perceived Stress in Medical under Graduates in a Rural Teaching Hospital in South India

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ABSTRACT

Background: Medical students face numerous stressors during their training in the field of health sciences which are unique and which cannot be overlooked. Fostering resilience can help individuals to better counteract the negative effects of stress. But little is known about medical under graduates resilience and its relationship to stress. **Aims:** To study the levels of resilience and perceived stress in medical under graduates. **Materials and Methods:** Using a cross-sectional design, 533 medical students were surveyed using the Connor-Davidson Resilience Scale and Cohen's Perceived Stress Scale. **Results:** Majority of the medical students showed high resilience and high stress scores. When the combination of resilience and stress was observed significant percentage of the medical under graduates were observed to score low in resilience and high on stress. Second year students were high on resilience and resilience scores tend to decrease with advancing age. **Conclusion:** Medical students should be provided with the resources and opportunity to become more aware of and indentify the stress faced in the professional training. Strong emphasis is made on interventions to better manage the stress and enhance resilience.

Keywords: Resilience, Perceived Stress, Medical Students, Under Graduates, Medical Education

Resilience is “The ability to bounce back from negative emotional experiences and by flexible adaptation to the changing demands of stressful experiences”.¹ One of the participant in a study described resilience to a rubber ball. If it's under pressure or something it can actually spring back to its size and shape and carry on without sustaining undue damage”.² This expression of Resilience as ‘bouncing back’ has lingered in the definition of resilience used across various research studies and literature. In a medical institution, resilience has a major impact on not only the academic performance but also on the relationship with peers

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and faculty.³ Resilient students have higher levels of motivation and the drive to perform better in stressful situations.⁴ Some researchers have suggested Resilience as an index of overall mental health.⁵ Beardslee stated that resilient individuals are 'survivors'.⁶ Resilient persons demonstrate a strong sense of self efficacy, self esteem and an action oriented approach to solve problems. They view stressful situations as having strengthening effect, more adaptable to change and easily use past experiences to deal with current challenges.⁷

Resilience is the beneficial outcome of the complex interactions between an individual and environment.⁸ It is the cumulative effect of various intrinsic and protective factors that allow an individual to be successful despite adversity, including temperament and personality, in addition to problem solving skills.⁹ In a study done by Fredrickson et al found that high-resilient individuals exhibited faster physiological and emotional recovery from stress.¹⁰ Psychological resilience is associated with resistance to and recovery from stressful life events.¹¹ When faced with significant stressors, some individuals succumb to pressure and show impaired functioning while others turn out resilient. Resilience in individuals smotheres the negative outcomes of stress.¹² The determinants that influence how a individual deals with a stressor and its possible outcomes include appraisal of the stressful situation, its potential consequences and the coping strategies used by the individual to tackle the stressors.¹³ Resilience, at its essence, is a concept to describe presence of risk experiences and a relatively positive psychological outcome despite those experiences.¹⁴

The goal of medical education is to develop competent, professional and compassionate doctors.¹⁵ But reasons like adjustment to the medical school environment, longer course duration, vast amounts to study, high competitive demands, Examination fear, high parental expectations, peer pressure, lack of leisure time, exposure to death and human suffering, pressures to perform, heavy workloads, struggles to maintain life balance, personal life events and educational debt cause considerable stress.^{16,17} These stressors not only affect the mental health of the individual but has deleterious consequences on his well being resulting in professional ineffectiveness with cynicism, academic dishonesty, poor decision making and lack of communication skills.¹⁸ Cicchetti in his study indicated that low perceived stress was one among the several factors moderating resilience.¹⁹ Another study suggested a negative correlation between individual resilience and perceived stress levels.²⁰

There is limited data available in the Indian scenario, earlier studies focused on the relationship of resilience and coping and quality of life²¹, resilience and coping²², resilience and stress.²³ With this background the current study aimed to: 1) To study the levels of resilience and perceived stress in medical under graduates.

MATERIALS AND METHODS

This is a cross-sectional descriptive study conducted in PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh. Convenience sampling technique was used. The MBBS course in India is a four and a half-year course of study followed by a year of Internship-Compulsory Residential Rotatory Internship. Participants included the first, second, third and fourth year M.B.B.S students. Students were prior notified of the study and were motivated to participate, with the understanding that the study was of voluntary nature. Students were approached during one of their regular lectures. With prior permission from the principal and consent of the concerned faculty a time slot was taken to interact with students for data collection. Directions to fill the questionnaire and rating scales were given verbally. The purpose of the study was explained, those who were willing to participate in the study were

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distributed hard copy of the questionnaire and scales along with the informed consent and the responses were collected. All participants were assured of confidentiality of the data provided. Maximum participation was encouraged by emphasizing that the questionnaire was anonymous and would not be revealed to parents or faculty. Students took 30-40 minutes to complete the questionnaire. The completed questionnaires were collected for data analysis. The data were collected in the mid –academic year to ensure that exam stress will not affect the analysis.

Those participants who gave written informed consent were included in the study. Students with pre-existing medical or psychiatric illnesses were excluded. Incomplete questionnaire were excluded. Approval of institutional Ethics Committee was sought before initiation of the study.

INSTRUMENTS USED:

- 1) **Socio demographic questionnaire**-it includes details of gender, age, course year, financial constraints, whether student got admission on merit or management quota.
- 2) **The Connor-Davidson Resilience scale (CD-RISC)**: comprises of 25 items, each rated on a 5-point scale (0–4). The CD-RISC is a self-report scale, developed by Kathryn Connor and Jonathan Davidson, designed to measure an individual’s resilience that would enable successful adaptation in the face of adversity. The CD-RISC has been tested in the general population, as well as in clinical samples, and demonstrates sound psychometric properties, with good internal consistency, construct validity and test–retest reliability. Respondents rate items on a scale from 0 (“not true at all”) to 4 (“true nearly all the time”). Range is 0-100 and higher scores indicate high resilience. For the purpose of the current study resilience scores were further classified as low and high resilience based on cutoff median score of 61.7 according to a study done by Peng et al²⁴ in china, study sample comprising of medical students. Licenses for using the CD-RISC were purchased and were included in the survey.
- 3) **Perceived Stress Scale (PSS)**: is the most widely used stress scale developed by Cohen. In the present study PSS-14 was used to measure the degree to which situations in one’s life are appraised as stressful. The questions in the PSS asked about feelings and thoughts during the last month. For each item participants responded on a 5point scale ranging from 0 = never to 4 = very often. PSS14 scores are obtained by reversing the scores on positive items, for example 0=4, 1=3, 2=2, etc. and then summing across all 14 items. Items 4, 5, 6, 7, 9, 10 and 13 are the positively stated items. The possible range of scores is 0-56. The 14-item PSS version was chosen due to its good psychometric properties and the evidence of its validity. The PSS has an internal consistency of 0.85 (Cronbach a co-efficient) and test-retest reliability during a short retest interval (several days) of 0.85. The range of PSS scores were divided into stratified quartiles. The upper two and lower two quartiles were combined (median score of 28 being the cut off value) and were classified as high stress and low stress respectively. This cut off value is similar to an earlier study in medical undergraduates in Pakistan.²⁵

RESULTS

A total of 550 students responded and consented to participate in the study, out of which 17 of the subjects returned incomplete questionnaire which were excluded. Data analysis was performed on the remaining 533 medical students. Out of the 533 medical students 54.03% (n=288) were females and 45.97% (n= 245) were males. First year students constituted

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26.45%, second year 30.58%, third year 22.89 % and 20.08% from fourth year. Students admitted under management quota were 217 (40.71%) and merit quota were 316 (59.29%). When evaluated for the presence of stressors 199(37.34%) reported of no stressors while academic stress was observed in 106(19.89%). Other students reported of difficulties in adjusting to hostel as stressful seen in 81(15.20%), 37(6.94%) had inter personal difficulties with friends, 35(6.57%) had some form of stress due to family and 75(14.07%) reported of more than one cause for their stress. Considering the age group 57.8% (n=309) belonged to 18-20yrs of age and 42.2% (n=224) were more than 20 yrs of age (Table 1).

Resilience scores on Connor-Davidson Resilience Scale had a mean score of 63.67 with standard deviation of 15.78. For the purpose of the study a cut off score of 61 was taken with scores less than 61 as low resilience and more than 61 as high resilience. Accordingly 227 of the medical students (42.59%) scored low on resilience and 306 (57.41%) had high resilience. The resilience measures in medical students less than 20 yrs of age was high and as the age progressed there was a tendency for the resilience measures to decrease which was statistically significant. Gender wise females compared to males scored high on resilience but this finding was not significant. When the students were stratified according to the professional year high resilience scores were observed in the second year closely followed by first year and resilience scores tend to reduce in the third to fourth year, which was statistically significant (Table-2). Looking into the quota of selection to the MBBS profession merit students were found to be more resilient than the management quota students though this was not significant.

Stress levels as measured by the Cohen's perceived stress scale were categorized into low and high stress levels with a cut off of 28. High stress levels were observed in 426 (79.92%) of the medical students with 107(20.08%) scoring low on stress levels. Majority of the medical students aged less than 20 yrs scored high on stress. Another noteworthy finding was that of females measuring high on stress levels as compared to their male counterparts both of which were not statistically significant. A statistically significant finding of the current study was that as medical students progressed from first to the fourth year the stress levels tapered with the highest stress levels in the first year and least in the fourth year (Table 3). Medical students admitted under the merit quota demonstrated high stress levels which was not significant. Out of the 426/533 students who scored high on stress 48.83% also were noted to have high resilience scores with a slightly higher proportion (51.17%) scoring low on resilience measures which was statistically significant finding (Table 4).

The relationship between perceived stress scores with the resilience scores measured by Connor-Davidson Resilience scale is shown in Figure 1. Overall a weak association was found

Between the perceived stress scores and the resilience scores (Pearson coefficient=0.370, $p < 0.001$).

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Table-1 socio demographic distribution of medical students

Socio demographic Data		Frequency(n)	Percentage(%)
Gender	Female	288	54.03
	Male	245	45.97
Year of MBBS	1 st	141	26.45
	2 nd	163	30.58
	3 rd	122	22.89
	4 th	107	20.08
Quota	Management	217	40.71
	Merit	316	59.29
Stressors	Family	35	6.57
	Friends	37	6.94
	Hostel	81	15.2
	Studies	106	19.89
	Combination	75	14.07
	Nil	199	37.34
CDRISC 25 Scores	<61	227	42.59
	>61	306	57.41
Stress Scale Scores	<28	107	20.08
	>28	426	79.92

Table-2 Comparison of socio demographic profile with CDRISC scores

Socio demographic data		Score of CDRISC25		P Value
		<61	>61	
Age	18-20 yrs	109(35.28%)	200(64.72%)	0.000*
	>21 yrs	118(52.68%)	106(47.32%)	
Gender	Female	122(42.36%)	166(57.64%)	0.908
	Male	105(42.86%)	140(57.14%)	
Year of MBBS	1st	45(31.91%)	96(68.09%)	0.000*
	2nd	63(38.65%)	100(61.35%)	
	3rd	53(43.44%)	69(56.56%)	
	4th	66(61.68%)	41(38.32%)	
Quota	Management	93(42.86%)	124(57.14%)	0.917
	Merit	134(42.41%)	182(57.59%)	

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Table-3 Comparison of socio demographic profile with Perceived stress scale scores

Sociodemographic data		Score of Stress Scale		P Value
		<28	>28	
Age	18-20 yrs	58(18.77%)	251(81.23%)	0.377
	>21 yrs	49(21.88%)	175(78.13%)	
Gender	Female	55(19.10%)	233(80.90%)	0.541
	Male	52(21.22%)	193(78.78%)	
Year of MBBS	1st	12(8.51%)	129(91.49%)	0.000*
	2nd	44(26.99%)	119(73.01%)	
	3rd	31(25.41%)	91(74.59%)	
	4th	20(18.69%)	87(81.31%)	
Quota	Management	34(15.67%)	183(84.33%)	0.035*
	Merit	73(23.10%)	426(79.92%)	

Table 4: comparison of CDRISC scores with perceived stress scale scores

Stress scale scores	CDRISC 25 Scores		P value
	<61	>61	
<28	9(8.41%)	98(91.59%)	0.000*
>28	218(51.17%)	208(48.83%)	

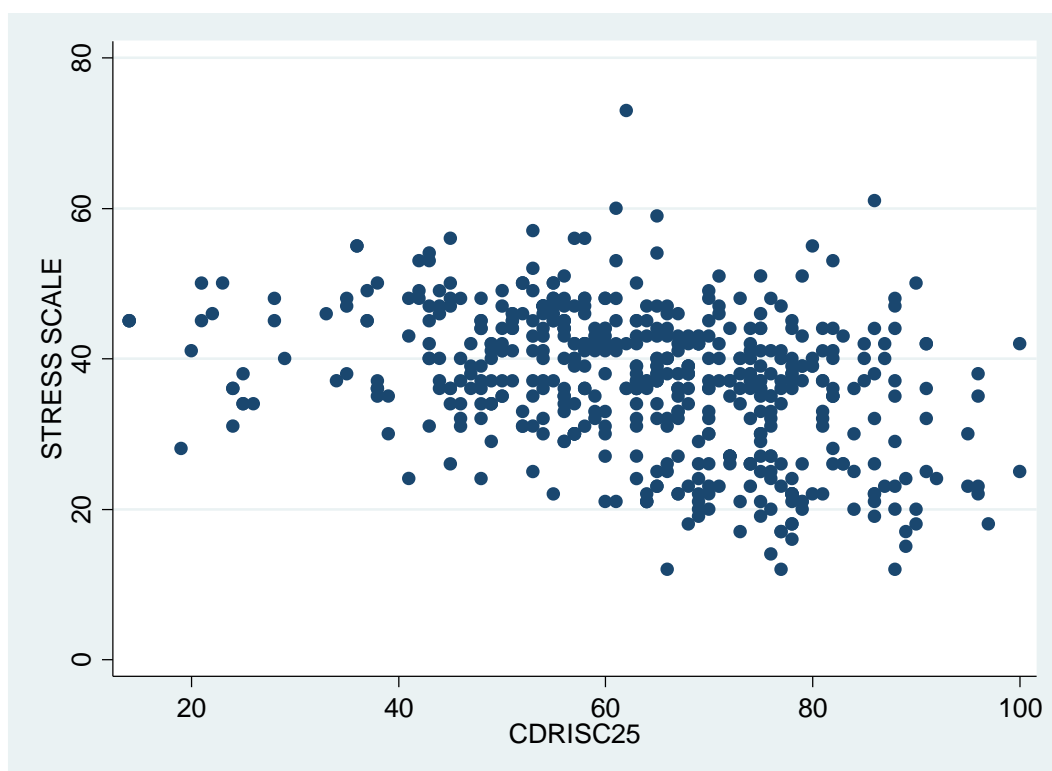


Figure 1: scatter diagram of distribution of CDRISC and stress scale scores

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DISCUSSION

The current study intended to assess the resilience measures and perceived stress in the medical undergraduates and the associations between these parameters. Greater than 50% of the medical students showed high resilience with a mean score of 63.67. While previous studies on resilience showed higher resilience mean scores 65.9 (18.5) in South African university students and 68.3 (12.3) in Australian undergraduates. Gender wise females showed high resilience than males though it was not significant. This is in contrast to study done by Peng et al where males showed high resilience.²⁴ Whereas a different study in medical students was similar to the current study depicting higher resilience in females.²⁵ This study showed that gender comparison has not reached statistical significance in terms of resilience which is similar to previous research in MBBS students.^{21, 29} This shows gender differences in resilience measures needs further investigation.

Significant proportion of merit quota candidates had high stress levels which could be due to the high expectations to meet the academic achievements and to stay ahead in the race.^{30, 31} Future studies need to further explore this under researched dimension of merit/management quota medical students stress and its role on resilience.

Resilience scores were high in the second and first year and least in the third and fourth year. On the contrary stress levels were highest in the first year and tend to fall with progression in the professional years. This shows that the first year students were highly resilient irrespective of the high stress levels. This could be explained partly that the entry into a medical profession comes with the package of difficulties where a student has to adjust to a new environment of academic arena coupled with facing inter/intra personal shortcomings. Stress being higher in the first year could also be due to they being accustomed to be on the top of the class in their prior academic field and now having to face the reality of being one of the many bright students who also end up taking medicine. This transition may provoke anxiety in most beginners in medical education. For the first year students in the current sample these stressors actually increased their resilience. This could be due to strategies implemented by students to become self reliant in their study habits, self directed learning and time management. Despite the stress and pressures, most first year students displayed tremendous resilience in the face of great demands on their inner resources, time, and energy. It can be stated that these youngsters attracted to medicine are more likely to possess the necessary resiliency.³²

The decrease in resilience scores as the students progressed into the final year is similar to a previous study in college students³³. Students have to deal with different personal or academic difficulties as they progress in their medical training which tend to deplete their coping reserve which in turn affect the resilience of under graduates. The third and final years are time when students are faced with increased academic demands coupled with clinical work. Another important finding is that resilience tends to decrease with increasing age. This could be due to the students gradually succumbing to challenges and pressures of medical education. This is in contrast to previous study that shows resilience increasing with advancement in age, also attributing it to the maturity obtained with increasing age.³⁴ A significant finding in the present study is that major proportion of the medical students had a combination of high stress and low resilience though high resilience was observed in 306 of the 533 participants. This could be due to hesitancy in seeking help due to associated stigma and avoidance due to lack of awareness in spite of the high stress levels²².

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Limitations in the current study include the cross sectional design of the study prevents a cause effect relationship to be established. As self reporting measures were used in the assessment it may have resulted in under reporting of data by the medical students. No questionnaires were used to assess the mental health of the participants which would have influenced the resilience scores. This study was conducted at a single teaching hospital and hence the findings cannot be generalized.

CONCLUSION

This study showed that resilience levels of students beginning their academic journey in the field of health sciences are high irrespective of the high stress levels. Further studies need to focus on the protective and risk factors that influence resilience in medical students. The stress levels reported by students in the current study warrants at developing a student oriented curriculum with specific focus on skill development rather than rote learning. Periodic monitoring of students stress levels and creating awareness with implementation of interventions to help medical undergraduates better cope with stress are strongly recommended. Further interventions to enhance the resilience of medical students by tapping into their psychological resources to deal with challenges faced in medical education are suggested by the researchers.

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Conflict of Interest

There is no conflict of interest.

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