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Student Research

Cross sectional assessment of empathy among undergraduates from a medical college



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ABSTRACT

Background: Empathy is essentially a desirable quality among clinicians and can be developed during medical education. Studies from outside India have shown that higher empathy is related to better competency and choice of specialty may be related to empathy levels in them. Change in empathy levels among undergraduate medical students with progressive training has been often ascribed to reasons such as curriculum content, timing of clinical rotations. Gender differences in empathy levels also vary among different countries. Since many of such factors differ in India there is a need therefore to understand empathy and its correlates among medical students in India.

Method: A cross sectional study was undertaken in a large medical college among the undergraduates of first, third, fifth, seventh and ninth semesters to measure their empathy levels. The evaluation was done using the Jefferson's Scale for Physician's Empathy- Student version.

Results: The study revealed highest empathy at entry level and a significant fall by seventh semester ($p = 0.002$). Female students had significantly higher empathy levels than male students ($p = 0.012$) across all semesters. The variance in empathy scores according specialty chosen is not statistically significant ($p = 0.2468$).

Conclusion: The progressive decline in empathy levels with years in medical college here is seen much later than in western studies. Female students are more empathetic than male students. The relation of mean empathy scores and choice of specialty is inconclusive and at variance from other studies.

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Introduction

The word empathy is derived from Greek word 'empathia' meaning affection or passion with a quality of suffering.¹ Empathy is essentially a cognitive phenomenon but it also involves affective sensitivity to patients' need and a behavioral ability to convey and communicate the same to him/her.² William Osler had very aptly summed up empathy when he said "it is as important to know what kind of a man (sic) has the disease as to know what kind of a disease has the man".³ Hozat had found in a study that medical graduates with higher empathy did better in clinical competence than on academic competence.⁴ Empathy among physicians is known to vary depending on their personality,⁵ choice of specialty.⁶

While some western studies among medical students found significant fall in empathy levels when they progressed from non-clinical to clinical training years,^{7–10} others like from Iran, Korea and Japan did not find any significant change in empathy; on the contrary the Japanese study reported increased empathy when students moved to clinical rotation.^{11–13} These differences probably could be due to differences in curriculum content and timings of clinical rotations.⁷ The curriculum in India differs from western countries in that clinical rotation starts from second year itself and from Korea and Japan in that there is no humanities content in the curriculum.^{12,13} Studies have shown that medical students who plan to pursue people oriented specializations such as internal medicine, family medicine, psychiatry and pediatrics showed higher empathetic scores and across all years of study in medical school than those who choose to pursue technology oriented specialties such as radiology, surgery and anesthesiology.^{8,14} These changes were reported more among male students and those selecting non-core subject such as other than internal medicine, family medicine, obstetrics and gynecology and psychiatry.⁷ Paula Neures et al had reported decline in empathy not only among medical student but also in dentistry, pharmacy, nursing, and veterinary medicine students.¹⁵

Studies have suggested that female are more receptive to emotions than male, have evolved with more caring attitude towards offspring as compared to male which contributes to better understanding and being more empathetic.^{4,16} Hojat et al had found that female students scored significantly higher on empathy than male students among medical students ($p < 0.01$).^{4,17} Newton et al had in study found female students to have same empathy as male students but had significant decline across medical years of education only in those who chose noncore (non-people oriented subjects) for specialization (2.25-fold decrease).⁷ However a study from Iran did not find any significant difference at all though female students did score more than male students.¹¹

Female students were found to have more empathy than male students across various years of medical education.^{4,7,8,13} However a Japanese study found no decline in empathy scoring as students progressed from non-clinical to clinical training.¹² In view of such varying empathy findings from different countries, we need to understand empathy among medical students in Indian context. Do our female students have more empathy than male students? Does choice of specialty correlate with levels of empathy? Do they

differ in any way from those of US and Japan? There has been no study among Indian medical students as yet.

This study was undertaken to measure empathy among medical students of various years with an objective to compare the empathy scores among the medical students of various semesters, to compare the empathy scores among male and female medical students and to compare the empathy scores among students who opted for technology oriented specialization with those who opted for people oriented specialization or were either undecided/chose other subjects.

Material and method

The study was conducted in a premier medical college on a single day. Prior sanction of the ethical committee and academic authorities was obtained. The students were briefly explained the nature of study, their consent was taken. They were assured of keeping the contents confidential. All forms were coded to avoid identification of the student by the authors. The coding was done by a person not associated with the study. The course of medical education is divided into nine semesters of six months duration each. This college has 105 male students and 25 female students in each semester. All first semester students were present for the evaluation, however some from other semesters were absent on that day. The first semester had just completed a month following admission and third semester had just a month of clinical rotation. The final semester was just three months away from final examinations. No exclusion criteria were used.

The Jefferson's scale for physician empathy(JSPE) student version was administered in their respective classrooms. Demographic particulars such as age, gender and choice of specialty were also asked for. The permission of the principal author of JSPE was obtained for utilizing and analyzing the data. The scale was completed in about 30 min and returned to the researcher.

The effect of specialization on empathy was assessed by grouping the choice of subjects of students into technologically oriented (Pathology, Surgery and surgical subspecialties, Radiology, Radiation Oncology, Anesthesiology, Preventive and Social Medicine, Otorhinolaryngology); people oriented (Internal medicine, Family medicine, Pediatrics, Neurology, Rehabilitation medicine, Psychiatry, Emergency medicine, Obstetrics and gynecology, Ophthalmology & Dermatology) as done by Hojat et al.¹⁴ Those who chose any other subject or were undecided were classified as others.

Scales for measuring empathy has been as varied as the definitions of it have been. Interpersonal reactive index (IRI) is a 28 item scale with 4 subcategories measuring different dimensions of empathy such as 'perspective taking' 'empathetic concern' and 'personal distress'. IRI taps both emotional and cognitive empathy.¹⁸ The balanced emotional empathy scale (BEES) is a well established 30 item scale for measuring empathy especially vicarious empathy, however it being gender sensitive males score lower than females.⁷ Emotional empathy scale measures emotional empathy, it includes 33 items.¹⁹ However none of them have been developed in a

Table 1 – Distribution of empathy scores across various semesters.

Semester	Number	Mean	Standard deviation	95% Confidence interval for mean		Minimum	Maximum
				Lower bound	Upper bound		
1	131	107.85	20.050	104.39	111.32	35	139
3	88	100.52	19.966	96.29	104.75	44	134
5	114	102.76	20.010	99.05	106.48	33	137
7	78	97.73	16.034	94.12	101.35	53	130
9	77	102.68	17.039	98.81	106.54	56	134
Total	488	102.91	19.217	101.20	104.62	33	139

specific patient–doctor context, and more specifically among medical undergraduates.

JSPE Student Version is especially designed to study empathy among medical students. It is a 20 item psychometrically validated instrument which consists of 20 statements and the respondent can indicate their level of agreement to each statement on a seven point Likert scale, thus possible score ranges from 20 to 140. Level of empathy is directly proportional to the score. Ten of the items are negative statements and marked in the reverse order.¹⁴ The JSPE student's version's validity and reliability has been well demonstrated, the Cronbach's-alpha internal consistency estimate for the 20 items on the JSPE was 0.76.¹⁷ This scale had been widely used throughout the world to measure empathy among medical, paramedical resident, practicing doctors as well as medical students, however in India till date no such study has been done on medical students. The medical students are all from English medium schools and are also undergoing current training in English medium, so the English version was used.

The data so collected was tabulated in an excel sheet, analyzed by EPI INFO 6 software under the guidance of statistician.

Results

A total of 488 students out of 650 enrolled in the college (75%) had participated in the assessment. Among them were 108 were female and 380 were male students. While the actual proportion of female students to male students in the college was 24:76, the sample proportion was 28:72. There were no invalid scales. The first semester students had completed just a month in college, while the third semester students had completed just about a month of their initial clinical rotations and the ninth semester students were just three months away

from completing the course. At the time of the study in this particular college only alternate terms were available which were from the regular batches, rest in even terms are the failure students and they account for only 1–2% and often difficult to trace. Hence were not taken up.

Table 1 shows that there is a decline in empathy after first semester but especially more in seventh semester. Multiple comparisons when done using total as the dependent variable across various semesters using the post hoc test of Bonferroni we found significant difference in the scores only between first and seventh semesters.

Significant decline in empathy was evident with time spent in undergraduate medical education (Table 2). However when a subgroup analysis was done to find effect of gender on this variation it was found that the female students had no significant decline in empathy across various semesters and it was the male students who showed the significant decline in third and seventh semesters (Table 3).

Analysis of variance in total empathy scores among all students depending on the specialty chosen by them revealed no significant difference (Chi-square = 190.5397, df = 178, $p = 0.2468$). Due to the small number of female students the difference in percentages cannot be commented upon (Table 4).

In analysis of data to see how choice of specialty was affected by level of empathy across various semesters those who chose either people oriented or technology oriented specialty it did not differ significantly, but it was the undecided students who had a significant increase in empathy in ninth semester as compared to that in first semester (Kruskal–Wallis H Test Chi Square = 21.7680 df = 4 $p = 0.0002$) (Table 5).

Discussion

A total of 488 students completed the form, which is much higher than the study from Japan¹³ and Iran,¹¹ almost similar

Table 2 – Comparison of empathy scores across various semesters.

(I) Semester	(J) Semester	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
					Lower bound	
1	3	7.33	2.609	.052	–0.03	1
	7	10.12*	2.708	.002	2.49	
3	1	–7.33	2.609	.052	–14.69	2
7	1	–10.12*	2.708	.002	–17.76	4

*The mean difference is significant at the .05 level.

Post hoc tests multiple comparisons dependent variable: total. Bonferroni.

Table 3 – Comparisons of total empathy scores across semesters according to gender.

Gender	(I) Semester	(J) Semester	Mean difference (I-J)	Std. error	Sig.	95% Confidence interval	
						Lower bound	Upper bound
Male students	1	3	9.672*	3.109	.020	.89	18.45
		7	11.103*	3.155	.005	2.19	20.01
	3	1	-9.672*	3.109	.020	-18.45	-0.89
		7	-11.103*	3.155	.005	-20.01	-2.19
	Between other semesters		No significant difference				
Female students	No significant difference						

* The mean difference is significant at the 0.05 level.

Post hoc tests multiple comparisons dependent variable: total. Bonferroni.

to that from Portugal²⁰ but lesser than that from US.⁸ There were no non-responders as all those present on the day of assessment completed the questionnaire (Table 1). This is in contrast to the poor response rate of third year students (77.2%) in the study by Chen et al⁸ in which incidentally a decrease in empathy scores was also found whereas in this study significant decline was evident only in seventh semester.

From this study we confirmed our first hypothesis that empathy declines during medical education but it reaches significant level only in seventh semester. Our second hypothesis also comes true that female students have significantly higher empathy than male students. However the third hypothesis was proven wrong, but it is to be noted that empathy level increases significantly ($p = 0.0002$) from first to ninth semester among those choosing specialties other than people/technology oriented specialization or remaining undecided (Table 2).

The mean empathy score of all the students was 102.91, much lower than that reported by Chen et al (114.3) but similar to those reported by Katoaka et al (104.30) and Rahimi et al (104.1). There is a need to further explore why most Asian students have almost similar scores but lower than the American studies.^{8,20,21} The empathy scores at the entry point of medical school is much less than those found in US by Chen et al (115.5), Hojat et al (114.5) but similar to that from Iran (110.3).^{8,11,14}

The curriculum in this college is different in many respects from medical schools in US, Japan and Iran. The students are exposed to clinical rotation from second year onwards (third semester). There is a decline of score in third semester (beginning of second year) but is statistically not very significant (Tables 1 and 3). Interestingly there is an increase in empathy

scores in fifth semester (beginning of third year) this could possibly be explained by the fact that these students were put through a course of communication skills in the preceding year, were actively seeing patients and were also engaged in clinical rotation of people oriented subjects.

The sharp decline in the empathy scores of 7th semester students (beginning of fourth year – Table 1) is similar to those found in studies of third year students in US.^{8,14} It is during this semester that students have examination for preventive and social medicine, otorhinolaryngology (non-people oriented subjects) and ophthalmology (people oriented) therefore probably are more inclined towards these subjects, which may be an explanation for the change. Katoaka et al have in their study argued that different entrance methods in medical schools and different cultures across various countries may account for variation in empathy.¹³

Moreover curriculum in this college differs significantly from both western and other Asian countries. Firstly students here have no exposure to humanities subjects such as economy, literature, philosophy and other sciences as found in Japanese medical curriculum and undergraduate curriculum in USA.¹³ Secondly students in this college are exposed to clinical rotation right from the beginning of second year in contrast to beginning of third year in USA, Iran and fifth year in Japan.^{8,13,14}

In a systemic review of study with medical students, Neumann et al had put forth some important issues that might explain the decline in empathy. One of them was that students themselves were probably overwhelmed by the mortality and morbidity that they encounter in clinical

Table 4 – Comparison of choice of specialty between male and female students.

Specialty	Frequency			
	Male students		Female students	
	No	Percent	No	Percent
Technology oriented	165	43.4%	34	31.5%
Person oriented	177	46.6%	56	51.9%
Others/Undecided	38	10%	18	16.17%
Total	380	100.0%	108	100.0%

Table 5 – Gender wise distribution of specialty in each semester.

Gender Specialty	Male students				Female students			
	0	1	2	Total	0	1	2	Total
Semester								
1	57	39	6	102	15	10	4	29
3	26	36	3	65	8	11	4	23
5	35	45	10	90	4	15	5	24
7	26	24	12	62	3	10	3	16
9	21	33	7	61	4	10	2	16
Total	165	197	38	380	34	56	18	108

0 = People oriented; 1 = Technology oriented; 2 = Others/Undecided.

Table 6 – Change in mean empathy score across various semesters as per specialty chosen.

Semesters	Other specialty/Undecided	People oriented specialty	Technology oriented specialty
1	97.4000	110.1429	107.7500
3	96.8571	101.4468	100.0000
5	101.4000	104.8167	100.1282
7	90.8667	97.2941	101.7931
9	109.7778	99.7209	105.2000
Bartlett's test for inequality of population variances	Chi square = 11.5472 df = 4 $p = 0.0211$	Chi square = 4.9396 df = 4 $p = 0.2936$	Chi square = 7.2425 df = 4 $p = 0.1236$
Kruskal–Wallis H test	Chi square = 21.7680 df = 4 $p = 0.0002$	–	–
ANOVA	–	F Statistic = 2.0516 df = 4 $p = 0.0887$	F Statistic = 1.0572 df = 4 $p = 0.3873$

0 = People oriented; 1 = Technology oriented; 2 = Others/Undecided.

rotations and most often they do not have anybody to help them to deal with such issues. Such issues are not routinely discussed with their trainers.²² This is very much applicable to our students as the curriculum or clinical training hardly contains anything that helps our students to deal with such issues. Another factor that they mentioned was distress in the form of burnout, reduced quality of life, depression arising from a variety of factors such as declining idealism, enthusiasm since joining medical college and reduced contact with family. The latter could be one cause of decline of empathy among our medical students as all of them stay in hostel away from home and have only 6–8 weeks of vacation during an academic year to be with their families. To ascertain this, comparison with students from other medical colleges in the same city with similar curriculum but not of residential nature is needed. This study does not measure any distress, quality of life or more variables. Other factors could be that students in clinical rotation do not follow up the patients for a longer period.

In this study there is significant difference ($p = 0.012$) in empathy scores between male and female with later scoring more than male students (mean female students 106.5v/s male students 101.89, Standard deviation 19.901 & 16.164 respectively) (Table 4), which is in consonance with studies from US Portugal and Japan.^{8,13,20} However the study from Iran did not find any significant difference though female students did have mean higher scores (105.6vs103.7).²³ The difference in this study from Iran could be due to varied proportion of female students to male students in both studies (22.13% vs70.16%). Dehning et al in a study of Ethiopian medical students also had found that males had lower empathy than females.²⁴

However, when compared semester wise the results are more interesting (Table 5). There is no significant difference

among female students in different semesters it thereby implying that the decline in empathy scores in third and seventh semester (those entering the fourth year) is entirely because of significant decline in empathy scores among male students. Significant difference (mean difference = 11.103) is seen among male students from first to seventh semester ($p = 0.020$). Thus we need to probably focus on improving male students empathy especially those of 7th semester (entering fourth year). Female students being by nature more caring and loving are probably less affected by factors that tend to diminish empathy. It could also be due to the fact that they can handle pressures of life much more easily; however these aspects have not been clarified by this study and warrant further studies.

It was interesting to note that more female students have chosen people oriented specialty (51.9 vs 46.6%) but due to their smaller numbers no significant statistical difference could be arrived at (Tables 2 and 5).

In this study no significant difference in empathy scores was noted among those choosing different groups of specialty ($p = 0.2468$). Whereas Chen et al had found students preferring people-oriented specialties having more empathy than those preferring technology-oriented specialties.⁸ However further subgroup analysis of the data revealed an interesting fact that empathy scores have been highest among students choosing people oriented subjects in first, third and fifth semesters, Hojat et al on the contrary found decline in empathy scores among those choosing technology oriented specialization in third year.¹³ It is surprising to note that in the final year those who are undecided about specialty or those choosing other subjects had highest mean empathy and those choosing people oriented subjects had least empathy score. Chen et al has also reported increased empathy among those choosing people oriented specialization and the difference is

Table 7 – Comparison of mean scores of empathy among male and female students.

	Sex	N	Mean	Std. deviation	Std. error mean	Significance
Total	Male students	380	101.89	19.901	1.021	0.012
	Female students	108	106.50	16.164	1.555	

There is a significant difference in empathy scores between male and female students.

statistically significant ($p = 0.002$) they also found little difference in mean empathy scores across first to third year among those choosing other specialties.⁸ However in this study the variance in empathy score across various semesters reaches a significant level only in the group of other/undecided specialty (Kruskal–Wallis H Test: $p = 0.0002$) while in the people oriented Analysis of Variance between groups (ANOVA $p = 0.08$) and technology oriented (ANOVA $p = 0.38$) groups it is not significant (Table 6). Change in awareness and perceptions of specialties may change the choice of specialties so it could be a bias in assessing the effect of changing empathy levels on choice of specialties. These aspects not being part of original study design therefore need to be verified in future studies Table 7.

Some of the limitations of this study have been as follows: Firstly the number of respondents was small in 7th semester, which could have probably affected the outcome of the study, especially the findings in relation to the specialty chosen. Secondly the fewer number of female students may have affected the overall mean empathy scores. Thirdly the findings being from a single medical college that is unique in many aspects may not be representative of empathy levels among medical undergraduates across the country. This uniqueness is in that it is an academy with compulsory residential stay away from family, have to adhere to discipline more assiduously than in other medical colleges. Fourthly this being just a cross sectional study the variance seen at different years of training may not be representative of actual decline from high baseline scores.

Conclusion

The decline in empathy levels with years in medical college is probably not just restricted to western colleges. Significant decline is seen much later than in western studies. Female students are more empathetic than male students. The relation of mean empathy scores and choice of specialty is inconclusive and at variance from other studies.

A longitudinal follow up study including a larger sample from more number of colleges would help find if decline in empathy with years in medical college is really true. It would also help understand the effect of gender and variation in choice of specialty based on empathy score. There is a need to also ascertain what factors could be instrumental in decline of empathy (if any noted) with increasing years in medical college.

Conflicts of interest

All authors have none to declare.

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Journal Scan

P. Little, F.D. Hobbs, M. Moore, et al., Clinical score and rapid antigen detection test to guide antibiotic use for sore throats: randomised controlled trial of PRISM (primary care streptococcal management). *BMJ.* 2013 Oct 10;347:f5806.

Sore throat is a common respiratory infection and most patients presenting with acute sore throat are prescribed antibiotics despite a Cochrane review documenting only modest symptomatic benefit. Clinical scoring (Centor criteria) and rapid streptococcal antigen tests (RADTs) are used to predict streptococcal infection and target antibiotics use. In this study conducted in primary care setting in UK authors tested a new scoring system, acronym FeverPAIN (Fever during previous 24 h; Purulence; Attends rapidly (within three days); Inflamed tonsils; No cough/coryza) and compared the three strategies for limiting or targeting antibiotic usage in patients aged ≥ 3 yrs presenting with acute sore throat. The objective of the study was to determine whether the use of this clinical score or rapid antigen tests compared to delayed antibiotic prescribing can modify antibiotic use and patient outcome. They randomized 631 patients into three groups based on method adopted for targeted antibiotic use: Delayed antibiotics group (the control group for analyses), Clinical score group, or Antigen test group (Antigen test used according to clinical score). In the delayed antibiotic group a prescription was prepared and left in reception, with advice to the patient to collect the prescription after three to five days if symptoms did not settle or were getting considerably worse. In the Clinical score group clinical score (FeverPAIN) was applied, and immediate antibiotics were offered for those with high scores (≥ 4). In patients randomized to the rapid antigen test group the clinical score was applied to all patients, and those with higher scores (≥ 3) underwent a rapid antigen test. The patients with negative results were not offered antibiotics.

Outcomes assessed were: Symptom severity reported by patients on a 7 point Likert scale at 2–4 days after the consultation (primary outcome), duration of symptoms and use of antibiotics. Follow up for primary outcome was 80%. Severity of symptoms was lower in the clinical score group (-0.33 , 95% confidence interval -0.64 to -0.02 ; $P = 0.04$), with a similar reduction for the antigen test group (-0.30 , -0.61 to -0.00 ; $P = 0.05$). Symptoms rated moderately bad or worse resolved significantly faster in the clinical score group (hazard ratio 1.30,

95% confidence interval 1.03–1.63) but not in the antigen test group (1.11, 0.88–1.40). Use of antibiotics was 46% (75/164) in the delayed antibiotics group, 29% (60/161) in the clinical score group (adjusted risk ratio 0.71, 95% confidence interval 0.50–0.95; $P = 0.02$) and 27% (58/164) in the antigen test group (adjusted risk ratio 0.73, 95% confidence interval 0.52–0.98; $P = 0.03$). There were no significant differences in the rates of complications or reconsultations. The authors concluded that targeted use of antibiotics for acute sore throat with a clinical score improves reported symptoms and reduces antibiotic use and antigen tests used according to a clinical score provide similar benefits but with no clear advantages over a clinical score alone. Based on the findings of this study clinical scoring (FeverPAIN) can be used to target antibiotics use for acute sore throat, which is likely to reduce antibiotics use and improve symptom control. There is no clear advantage of a rapid antigen detection test over the clinical score alone. Use of clinical score alone may save health care costs on preventing the need for rapid strep testing and decreasing the antibiotics usage. Although the inclusion criteria allowed children, this was primarily a study of adults as the mean age of study participants was 29–31 yrs. Given that rating scales differ considerably in children versus adults and the sample size does not allow subgroup analysis by age, the conclusions of the study cannot be applied to children. The clinical score (FeverPAIN) is new and interesting because its use may save health care costs and antibiotics usage. Further studies in larger patient groups including children are needed to study this approach in depth before the results can be extrapolated to children.

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