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ORIGINAL ARTICLE

Does Empathy Decline in Medical Students during the Course of their Professional Training? A Cross-Sectional Study.

Mayobhav V.[1], Gracia Sohkhlet[2], PrernaVerma[2], Suprakash Chaudhury[3], Amitav Banerjee[4]

Abstract

Background: Empathy is a necessary attribute in a good clinician as it has been shown to enhance the diagnostic capabilities as well as improve doctor-patient communication. Aim of the study was to assess empathy in medical students during their professional training and its correlates. **Methods**: This was a cross-sectional analytical study, carried out among medical students in India between April 2021 and May 2021. Data collection was done using google forms. The questionnaire consisted of demographic information, hobbies like reading fiction, philosophy, watching movies/dramas etc. and a standard instrument for measuring empathy was administered. Jefferson Scale of Empathy (medical students' version) was utilized for measurement of empathy. **Results**: A total of 470 medical students were enrolled for the study. Total mean empathy score was found to be 103.3 ± 13.67. First year students had significantly higher scores of empathy than fourth year students (105.4 ± 14.6 vs 100.9 ± 14.3). Females had a higher empathy score compared to males (104.5 ± 13.4 vs 101.2 ± 13.7) but the difference was not statically significant. With time spent in undergraduate medical education, there was a statistically significant drop in empathy. There was no association of exposure to humanities and empathy. In the multivariable linear regression model, sex, year of medical school and the number of close friends were found to be significant predictors of clinical empathy. **Conclusion:** Mean empathy scores found in Indian medical students was low when compared to Western counterparts. Though female medical undergraduates had a higher level of empathy than males, there was a general erosion of empathy with the progression of year in medical school.

Key Words: Clinical; Empathy; Medical students; Skill; Humanity

[1] Medical Students [2] Jr. Resident, [4] Professor & HOD, Department of Community Medicine, [3] Professor & HOD, Dept. of Psychiatry, Dr. D. Y. Patil Medical College, Dr D Y Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India

Corresponding Author: Dr. Suprakash Chaudhury, Department of Psychiatry, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Dr. D. Y. Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India

e-mail: suprakashch@gmail.com

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Introduction

Empathy in the clinical setting is the ability to comprehend the patient's situation, viewpoint, and state of mind, communicate that understanding and act on that understanding with the patient in a therapeutic way [1]. At the frontlines of healthcare, doctors are routinely confronted with challenging situations. While it may be alluring to emotionally distance oneself from suffering, empathy strengthens the doctor-patient relationship and is a prerequisite to communication competence. It is essential in the delivery of high-quality medical care. For the patients it has a positive effect on both psychosocial outcomes (e.g., fear, quality of life, anxiety, and depression) as well as on independently assessable outcome parameters (e.g., symptom and pain reduction and reduced recovery time). [2,3]

For the physician it helps to resonate with the needs of patients, improves clinical outcomes, patient satisfaction, compliance, and trust and reduces the risk of physician burnout [4, 5]. Though it is an inborn ability in some people, it is a capability that can be developed. [6]. The importance of role of empathy has led to interest in measuring empathy levels in various stages of medical education. [7, 8, 9]

Tests to measure empathy have been conducted before selection to medical school and during training to predict future success in the field of medicine. Western studies have indicated a decline of empathy among medical students

during clinical years particularly when moving from non-clinical subjects to clinical rotations [10, 11], while some have refuted this [12]. Some studies have also shown discrepancies in empathy levels between genders with female students having higher mean scores than males. The recent rise in violence against doctors further highlights the issue that there may be an underlying deficit in empathy levels. [13].

Another contentious issue is whether lack of exposure to humanities in the form of literature, fiction, drama, etc. is resulting in an emotionally stunted doctor [14]. Recent studies suggest that exposure to humanities in the form of fiction and drama enhances empathy in medical students [15, 16]. Goldstein [17], suggests that this is due to fiction being non-anxiety provoking compared to fact. This offers a safe haven to undergo strong emotions. One can empathize strongly with a fictional individual without the onus of obligation. Genuine information may cause feelings of obligation toward the victims inducing denial or dampening of emotions. Because of these dynamic forces, one can say that fiction can work as a "skills lab" for empathy.

Previous studies of empathy in Indian medical students gave contradictory results.

One study found a significant fall in empathy by the 7th semester. They also found females to have much higher empathy levels than male students. [18]A second study found neither a significant drop nor enhancement of empathy scores as undergraduate medical students progressed through medical course. However, women had significantly higher mean empathy score than men.[19] Another study found that the empathy levels initially declined but again rose in the 7th semester. Students' empathy scores were not significantly influenced by their age, location of residence, who made the decision for them to enrol in an MBBS programme, or their future speciality choice. Again females had higher empathy scores than males.[20]

Due to paucity of Indian research in this area as well as conflicting results, this study was undertaken. It aims to provide a better and a more comprehensive understanding for any changes in empathy during medical training as well as its predictors and whether exposure to humanities and art in the form of fiction and drama/movies, is associated with levels of empathy.

Materials and Methods

The Cross-sectional Analytical study was carried out among medical students in a medical college in India. The sampling frame was all medical students. Ethical clearance from the Institutional Ethics Committee was obtained before beginning the study. Informed consent of the participants was also taken prior to administration of the survey.

Sample size and Sampling method

Study sample size was calculated on presumption of 50% prevalence of empathy (collapsing the scale into categorical scale using a cut off score), in the study population. This is a default presumption which estimates the maximum sample size required for an exploratory study. Using this benchmark and with a 95% confidence limit of 5%; and design effect of 1, the sample size calculation using Stat Calc function of Epi Info 7 software was 384. The questionnaire was given to 1st, 2nd, 3rd and 4th year students of various colleges through google forms.

Inclusion Criteria

All students from 1st, 2nd, 3rd and 4th academic year enrolled in the medical college.

Exclusion Criteria

Students with a chronic medical or psychiatric disorder and those who were not willing to participate

Tools used

Jeffersons scale of Empathy(Medical Students' Version) (JSE)

The JSE, a 20-item scale having 7 point Likert scale (from strongly disagree to strongly agree), was applied to measure empathy level of medical undergraduates. The total scores range from 20 to 140. Greater scores indicate greater empathy. The JSE has a high level of internal consistency, with a Cronbach alpha of 0.80. Earlier use of the JSE among medical undergraduates all over the world produced results that are comparable across cultures. [21,22]

The Study Questionnaire

The Study Questionnaire had four sections. Section 1 briefly explained the background and the need for the study. Section 2 contained the written informed consent. Section 3 comprised of demographic details, type of family, number of friends reading fiction, philosophy, watching movies and dramas, past medical and psychiatric disorders. Section 4 comprised questions of JSE.

Procedure

Due to Covid-19 restrictions data collection was done via sending out google forms instead of face to face interview. Informed consent was undertaken before and they were assured of their anonymity.The survey questionnaire in the google for was sent to all the students. To eliminate the chances of incomplete filing of forms all questions were compulsory to incomplete responses. The google form link was active during 01 April and 31 May 2021. Two reminders were also sent to the students.

Statistical analysis

SPSS version 26(IBM, Chicago, USA) software was used to analyse the data. Chi square was used for categorical data Differences between groups were analysed using the student t-test and ANOVA for continuous data. Mann–Whitney U test, Spearman correlation and Kruskal-Wallis analysis of variance was used for ordinal data. The factors which were found to have a significant impact on empathy were entered into the linear regression model and strength of association was assessed using unstandardized beta and 95% confidence intervals.Multiple regression analyses were used to find predictors of empathy. A P-value of < 0.05 was deemed to be statistically significant.

Results

A total 470 students participated in this study out of which 179 (38.08%) were males and 291 (61.91%) were females. Age of the medical students included in the study is given in Table 1.ANOVA for age was done and value of F was 91.727; p< 0.000 which was statistically significant. This was confirmed by t test. (Table 1)

There was no significant difference in distribution of students with regard to sex, type of family or reading various genres of books; however, a statistically significant difference was found within students in different years who regularly watched some drama (p=0.004). (Table 2)

The mean ± S.D. of empathy score of all the students was 103.30±13.67. Females had a higher empathy score (104.5 ±13.49) as compared to males (101.27 ± 13.70) but this difference was not statistically significant (Mann Whitney U=24255.500; P<0.211). With time spent in undergraduate medical education, there was a statistically significant drop in empathy. (Kruskal Wallis Chi square = 16.163, df = 3, p = 0.001). But this significantdecrease in empathy occurred going from 2nd year to 3rd year. The lowest empathy scores were seen in 4th year students (100.9 ± 14.3). (Table 3). Empathy was highly significantly negatively correlated with age (Spearman's rho= -0.151; P<0.001) and year of MBBS (Spearman's rho= -0.160; P<0.000). Empathy was significantly positively correlated with being female (Spearman's rho= 0.113; P<0.015). the number of friends (Spearman's rho= -0.136; P<0.003).

The results of multiple regression analysis can be summarized as under:

Multiple linear regression analysis done via stepwise method was run to predict empathy scores from number of friends, year of medical school and sex. These variables statistically significantly predicted empathy, F (3,466) = 12.350, p<0.000, R2 = 0.074. The Durbin Watson value was 2.105 indicating absence of first order linear auto-correlation in the data. The Coefficient table(table 4) shows the strength of the relationship i.e. the significance of the variable in the model and magnitude with which it impacts the dependent variable.

Discussion

This study was a cross-sectional analytical observational study in a medical college which explored empathy levels of medical students and its predictors. The mean empathy levels for all students found in this study were 103.3 which is much lesser than foreign studies conducted by Chen et al (114.3), Quince et al (113.03) and Santos et al (119.7) [22, 23, 24]but comparable to studies done in Asiasuch as in Japan by Katoaka et al (104.30).[25]These differences between Asian and Western countries may be attributed to differences in cultural factors, custom, ethnicity, spiritual belief, and educational system Also, physicians in Asia are said to have a more paternalistic role in doctor-patient relationships.[26] This needs further inspection.

This study's empathy scores are comparable to similar studies done in the Indian subcontinent by Shashikumar et al (102.9), Murthy PS et al (103.3) and Chatterjee et al (96.01)[18-20] Low levels of empathy in Indiaareseenwhen compared to foreign counterparts because in Indian setting, science-based curriculum is more highly emphasised, and entrance to medical school and even into postgraduate courses is based on it. Admission is based only on a student's merit i.e. entrance exam scores and thus no focus is placed on co-curricular overall growth. Also the Indian curriculum differs greatly from that of both Western and Asian countries. Students here do not have access to humanities disciplines like economics, literature, philosophy, and other sciences that are taught in Japanese and USA medical curriculum.[26]

Empathy and year of Medical school

In our study the mean empathy scores significantly decreased from 2nd year to 3rd year with the 4th year students having the lowest scores.Many other studies have looked into the relationship between the number of years of medical education and empathy scores, with some finding an increase in clinical empathy with more years of education[24], others finding a decreasing trend over time [18,19, 20], and some finding no significant difference in empathy scores across years of medical education.[27]

After evaluating other studies, Hojat, one of the authors of the JSPE scales and the author of numerous studies on empathy, determined that the third year was the important year in which empathy scores began to decline, which is also in agreement with our findings. It may be due to the stress of sudden exposure to the clinical setting because in the Indian medical curriculum, clinical subjects start mainly from the 3rd year of medical school. Unrealistic expectations, a loss of idealism, negative role models, and a lack of support, inappropriate learning environments, and excessive amount

Table 1: Age of the students in four years of MBBS.

Year of MBBS (No. of students)	Age Mean (±S.D.)	Comparison of age					
		1st vs 2nd	1st vs 3rd	1st vs 4th	2nd vs 3rd	2nd vs 4th	3rd vs 4th
1st Year (111)	105.43 (±14.69)						
2nd year (90)	106.64 (±12.87)	P= 0.0	P= 0.0	P= 0.0	P= 0.0	P= 0.0	P= 0.0
3rd Year (148)	101.6 (±12.02)						
4th Year (121)	100.94 (±14.36)						

Table 2: Distribution of students by sex, type of family, reading habits and friends.

		1st yr	2nd yr	3rd yr	4th yr	P value
Sex	Male	37	32	62	48	**0.503**
	Female	74	58	86	73	
Type of Family	Nuclear	74	72	113	95	**0.98**
	Joint	37	18	35	26	
Read Fiction	Never	42	40	53	58	**0.21**
	Yes	69	50	95	63	
Read Philosophy	Never	64	48	72	54	**0.555**
	Yes	47	42	76	66	
Read History	Never	75	60	97	86	**0.80**
	Yes	36	30	51	35	
Watch Drama	Never	1	1	1	8	**0.004**
	Yes	110	89	147	113	
Close friends	1	8	6	12	8	**0.18**
	2	24	14	19	15	
	3	33	19	35	29	
	>3	35	46	71	64	
	None	11	5	11	5	

Table 3: Distribution of students in the four years of MBBS and Mean and Standard Deviation empathy scores by students from each year

Year of MBBS (No. of students)	**Empathy Mean (±S.D.)**	**Comparison of empathy scores**					
		1st vs 2nd	**1st vs 3rd**	**1st vs 4th**	**2nd vs 3rd**	**2nd vs 4th**	**3rd vs 4th**
1st Year (111)	105.43 (±14.69)						
2nd year (90)	106.64 (±12.87)	P= 0.664	P=.015	P=.013	P=0.002	P=0.002	P=0.258
3rd Year (148)	101.6 (±12.02)						
4th Year (121)	100.94 (±14.36)						

Table 4. Multiple regression analysis for predictors of empathy: Estimated Model Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients Beta	p value
		B	Beta		
3	(Constant)	103.376	2.036		.000
	friends	2.255	.503	.203	.000
	MBBS year	-2.055	.555	-.167	.000
	Sex	-3.701	1.266	-.131	.004

a. Dependent Variable: empathy; VIF=Variance inflation factor

of material to learn, an excessive workload, time pressure, patient factors, stress and anxiety are all factors that contribute to this decrease.[28]The significant fall of empathy particularly 4th year students showing the lowest scores is a matter of concern. Neumann et al[1] in his systemic review of literature had proposed that students are often overwhelmed by the mortality and morbidity they face during clinical rotations, and they frequently have no one to assist them in dealing with such difficulties. Distress in the form of burnout, lower quality of life, and depression resulting from a range of variables such as declining enthusiasm since beginning medical school, and limited contact with family were also reported. This holds particularly true for our study as the college is mainly based on hostel residence and students only get 4-5 weeks of holidays in a year to visit their families.

Empathy and Gender

In our study, empathy was found to be significantly correlated with gender with females showing higher empathy scores than males. This difference was present across the years with females consistently showing higher scores than their counterparts. This is in line with the findings of numerous studies conducted around the world.[22, 25, 29, 30] Hojat et al in his longitudinal study found that despite the fact that mean empathy scores in males and females changed equally over time, females continually outscored males, and the gap remained significant [28] This is comparable with the current study. These results may be explained by the expectations associated with traditional gender roles, which hold especially true in Indian culture. Females have greater empathy disposition in comparison to men as has been shown in various studies [31] Also female students, who are more compassionate and loving by nature, are likely to be less affected by variables that reduce empathy. Further studies are required for deeper understanding of the role of gender in empathy.

Empathy and Exposure to humanities

In our study reading different types of books had no significant impact on the levels of clinical empathy. However students who regularly watched drama showed higher levels of empathy. Studies by Brock et al and Oatley et al have shown that exposure to humanities in the form of drama or fiction increases empathy in medical students which is comparable to the current study. [15, 16]This outcome may be explained by the fact that fiction is non anxiety provoking when compared to fact. Thus this provides a safe haven for the student to experience strong emotions. One can empathize strongly with a fictional character without the burden of obligation [17]. This warrants further research. Methods to evaluate exposure to humanities are vague and in this study it was measured by the amount of reading books one does. This is an unreliable indicator as the genre of book may greatly vary from thriller fiction to philosophical books which may result in different empathy scores. This may be the reason why the present study found no significant differences with the three genres considered; fiction, history and philosophy books.

Empathy and Type of family

This study did not find any correlation between the type of family and empathy scores.

The type of family was categorized as a nuclear and a joint family. This may be due to the fact that when this study's questionnaire was distributed to the subjects, there was a nationwide lockdown due to covid-19. This may have resulted in blurring of the distinct line between a nuclear and a joint family. Being a part of a joint family inculcates traditional values as well as feeling of togetherness which may increase the empathy scores however it is contrary to our findings.

Empathy and Number of Close friends

In our study, the number of close friends a student has was seen as a direct predictor of empathy levels. It was statistically significant. Kardos et al found that empathic people have a higher number of close friends than people with lower scores of empathy. [32]Similarly, we cannot ascertain that higher a number of close friends may lead to the person having higher empathy as it may very well be true that empathic people themselves have more number of close friends. However,

having close friends provides a safe space for one to confide into and withstand the emotional blunting of the everyday stress one might feel in the medical curriculum. This novel finding of the current research warrants further exploration.

Limitations

Self-reporting questionnaires contain their own set of biases, which might affect the outcomes. For example there may be over reporting of empathy by participants for social desirability. Being a cross sectional study, it cannot be utilised to comment on causal associations. The variance in empathy observed may not be indicative of true decrease from the baseline scores. The findings may not be reflective of empathy levels among medical undergraduates across the country because they come from a single medical college.

Conclusion

Total mean empathy of Indian medical students was found to be lower than that in foreign countries but similar to other studies in the Indian subcontinent. Empathy diminished with time spent in medical school, confirming past research in this area. Clinical empathy is negatively correlated with age amongst medical students. Clinical empathy is positively correlated with number of close friends a student has. Contrarily exposure to humanities andthe type of family a student belongs to has no impact on empathy scores.

Longitudinal research with the sample from a number of different colleges is warranted to know more about the predictors of empathy as well as the causal associations. Causal association of number of close friends and empathy may be determined in a longitudinal study.Further research is required to ascertain the differences and causes of lower mean empathy scores found in India when compared to the Western studies.

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