The Cross-Sectional Study for Comparison of Empathy-based on Competency-based Curriculum among Indian Undergraduates

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Abstract

Introduction: Competency-based medical education (CBME) was introduced by the National Medical Commission in 2019. The system tries to incorporate the Attitude, Ethics, and Communication (AETCOM) module for the enhancement of empathy, cognition, and soft skill development in undergraduates (UGs). Longitudinal and comparative studies in this area show mixed findings regarding response to CBME. Therefore, this study aims to compare empathy in UGs before and after the introduction of a new curriculum and assess the predictors for the same.

Methods: The empathy was assessed and compared cross-sectionally among 700 UGs, belonging to both old and new curricula, with the Toronto empathy questionnaire (TEQ).

Results: A course of fluctuating levels was observed in empathy for UGs with advancement of MBBS years followed by a dip in the end. Females (47.52 ± 6.00) had more empathy scores than males (42.97 ± 7.55) with significance (p < 0.05). There was no comparable rise in empathy scores with the introduction of a new curriculum. Gender proved significant in predicting empathy with multiple linear regression (p < 0.05) in both CBME and non-CBME students.

Conclusion: The nurture of empathy starts during early medical education. The students had a decrease in empathy scores at the end of medical training, with females having higher empathy levels. The new curriculum tries to inculcate empathic communication for better care but needs further evaluation on causal factors and data on longitudinal trends.

INTRODUCTION

Empathy is a cognitive and emotional attribute that involves an ability to understand and feel the patient's inner experiences perspectives and efficiently communicate this understanding with an intention to help.[1,2] Medical education works to cultivate and nurture empathy in the formative years and improve with the advancement of the course of study. Studies present conflicting notions of empathy being a state or a trait.[3] It may exist as a relatively stable,

constitutional trait correlating with gender, personality traits or a mutable state, affected by cognitive and affective responses to changing circumstances like life experiences.[4,5]

The National Medical Commission (NMC) recently updated the medical education curriculum in 2019 with specific learning objectives (SLOs) to address primarily three domains: Cognitive, psychomotor, and affective. Compared to the older system with strict compartmentalized years, the competency-based medical education (CBME) incorporates the attitude, ethics, and communication (AETCOM) module to inculcate empathy, communication and leadership.[6] This approach focuses on the development of soft skills *via* interactive discussions, activity-based learning and maximal use of research materials.[7] Hence, the physician is armored not only with knowledge but skills, attitudes, values, and responsiveness at the first contact with the community.

Studies on empathy in medical students have reported mixed findings of a significant decline in empathy[8,9] or no significant change[10,11] with advancement in medical training. There has been research on change of empathy with the new curriculum, but only a handful have compared it with the traditional approach from India.[12] Hence, the current study aims to assess the empathy scores, delineate the predictors, and compare empathy in undergraduate (UGs) medical students before and after an introduction of the new module and its correlates with sociodemographic factors.

Materials And Methods

The cross-sectional study was conducted on 700 UGs medical students at a tertiary care hospital in western India. After approval from the Institutional Ethics Committee (IEC), all the students were approached with assured anonymity and confidentiality of their responses. The responses were collected over a period of three months from January to March 2022, with a semi-structured questionnaire. The questionnaire was administered to undergraduates in their respective lecture theatres after verbal instruction and was free to ask for clarification if required. Students who did not give consent for the study or those with incomplete responses were

excluded. The sample was purposive and the study tried to assess as many participants as possible during the procedure.

The questionnaire consisted of sociodemographic details and a Toronto Empathy Questionnaire (TEQ). The sociodemographic profile included variables such as age, gender, MBBS year, choice of future specialty, accommodation status, decision to enroll in medical specialty and history of psychiatric illness in self or close relative. The choice of future postgraduate specialty was divided into medicine and allied branches (as General medicine, TB chest, Dermatology, Psychiatry, Pediatrics, Family Medicine), surgery and allied branches (General Surgery, Orthopedics, ENT, Ophthalmology, Anesthesiology) and unspecified group (the future branch is yet to be decided). The TEQ was used to quantify and assess the behavioral, emotional, cognitive, and physiological aspects of empathy in medical students.[13-15] It is a self-reported 16-item tool which rated on a 5-point Likert -type with normal scoring for positively worded items and reverse scoring for negatively worded items. Higher scores indicate higher empathy levels.[16]

The responses collected were analyzed using the Microsoft Excel application. Scores on different questionnaires were represented as mean, standard deviation (SD), and differences in empathy assessment of different curricula were analyzed using an independent T-test. Correlations between dependent and independent variables were derived using Pearson's correlation coefficient. Serial logistic regression was performed with TEQ scores as outcome variables, with independent predictor variables. A *p - value* of less than 0.05 was considered significant.

Results

Out of 700 students, 30 students were excluded due to incomplete submissions, leaving behind 670 for final analysis. There were 397 (59.3%) females and 273 (40.7%) males. The mean (SD) age of the students was 21.52 (± 2.17) years. The history of long-term illness in self and first-degree relatives were 2.9 and 14.7%, respectively. About 94% of the students reported that they chose the medical school voluntarily. The willingness to pursue career in surgical-allied, medicine-allied branches and yet to decide

Table 1: Comparing empathy scores with respect to curriculum

MBBS years	N	Mean Score ± SD	p - value
CBME batch	401	45.39 ± 7.426	0.03**
Non-CBME batch	269	46.10 ± 6.419	

(** states Significance, $p < 0.05$)

groups were 47% (M = 45.99 ± 7.45), 40% (M = 45.62 ± 6.61) and 13% (M = 44.55 ± 6.75), respectively. The mean empathy score of the total sample was 45.67 (± 7.04), with a greater mean (SD) score in females at 47.52 (± 6.00) as compared to males at 42.97 (± 7.55) and it was statistically significant ($p < 0.05$).

The mean empathy scores of day scholars (46.23 ± 6.4) were higher compared to the hostel students (45.06 ± 7.5) with significance ($p < 0.05$) suggesting staying with family inculcates emotions and empathy. Rest other independent variables did not affect the empathy levels. There was a mild improvement in the mean empathy score as UGs progressed in their academic careers but it declined minimally at the end. An independent T-test was used to compare the mean empathy score of UG

students belonging to the new curriculum (CBME batch- First and Second MBBS) and old curriculum (Non-CBME- Final MBBS). On comparing independently, the CBME students (n = 401, M = 45.39, SD = 7.4) had mild higher empathy scores compared to their counterparts (Non-CBME, n = 269, M = 46.10, SD = 6.4) and this difference was significant ($p < 0.05$) (Table 1).

An independent T-test was used to compare the bi-variate variables with the empathy scores of students belonging to the new curriculum and old curriculum, respectively. The females (n = 249, M = 47.45) had higher empathy scores than males (n = 152, M = 42) in the CBME. This was true even for the females (n = 148, M = 47.65) and males (n = 121, M = 44.2) in the non-CBME batch. On comparing the difference in empathy of curriculum with gender, there was a significant difference in empathy in both types of curricula ($p < 0.05$). The CBME students staying at home (n = 202, M = 46.59) had better empathy scores compared to the students living at hostels (n = 199, M = 44.17) with significant differences ($p < 0.001$). There was a significant difference for CBME students for the variables of any history of long-term illness

Table 2: Comparison of empathy scores with respect to the change in curriculum

Variable	CBME		Non-CBME	
	Mean ± SD	p - value	Mean ± SD	p - value
Gender				
Male	42 ± 7.99	0.000**	44.2 ± 6.8	0.000**
Female	47.45 ± 6.21		47.65 ± 5.6	
Current residence				
Home	46.59 ± 6.6	0.001**	45.74 ± 6.2	0.319
Hostel	44.17 ± 8.0		46.53 ± 6.6	
Decision to enroll in medical education				
Personal	45.44 ± 7.4	0.816	46.03 ± 6.4	0.847
Others	44.26 ± 7.9		47.19 ± 6.7	
Any H/O long term illness in self				
Yes	45.59 ± 8.4	0.012**	48.18 ± 6.6	0.272
No	41.11 ± 7.3		46.01 ± 6.4	
Any H/O long term illness in relative				
Yes	47.98 ± 7.1	0.000**	45.65 ± 6.3	0.506
No	44.67 ±7.3		46.25 ± 6.4	

(** states Significance, $p < 0.05$)

Table 3: Comparison of empathy scores with respect to the change in curriculum

Variable	CBME		Non CBME	
	Mean ± SD	p - value	Mean ± SD	p - value
Age (Years)				
<20	46.49 ± 7.0		45.00 ± 6.5	
20–22	44.21 ± 7.6	0.006**	46.17 ± 5.7	0.868
>22	42.25 ± 6.1		45.56 ± 7.4	
Choice of future post-graduate specialty				
Medicine and allied branches	45.59 ± 7.3		45.65 ± 5.8	
Surgery and allied branches	45.40 ± 7.6	0.790	47.30 ± 6.8	0.03**
Yet to Decided	44.71 ± 6.6		44.35 ± 6.9	

(** states Significance, $p < 0.05$)

Table 4: Multivariate linear regression for empathy scores

	Unstandardized coefficients		Sig.	95.0% CI For lower bound-upper bound
	B	Std. error		
CBME				
Age	-2.059	0.952	0.031**	-3.931–0.187
Gender (Female)	4.794	0.706	0.000**	3.406–6.182
Current residence (Home)	1.875	0.688	0.007**	0.521–3.229
H/O long-term illness in self (No)	5.861	1.655	0.000**	2.607–9.115
H/O long term illness in close relative (No)	-2.510	0.841	0.003**	-4.163–0.857
Non-CBME				
Gender (Female)	3.829	0.772	0.000**	2.309- 5.349

(** states Significance, $p < 0.05$)

in self or close relatives. Students who did not have a long-term illness in self (n = 383, M = 45.59) had better scores than those with illness (n = 18, M = 41.11). On the contrary, the students with a close relative having an illness (n = 87, M = 47.98) scored higher than their counterparts (n = 314, M = 44.67) (Table 2).

One-way ANOVA was performed to compare the effect of empathy scores with respect to age and the future choice of postgraduate specialty course. Contrasting results showed that the CBME students had proved significant change in empathy with respect to age, whereas the non-CBME students showed change with respect to future choice of postgraduate specialty ($p < -0.05$) (Table 3).

A series of independent linear regression models followed by a multivariate regression were used to test if the independent variables could significantly predict for empathy in the students. Out of all the predictors, gender only proved to be significant contributor ($p < 0.000$). When a similar regression technique was used independently for CBME and non-CBME students, gender, as stated earlier stood significant only in the non-CBME batch. In CBME, age, gender, current residence and any history of long-term illness in self or relative were significant predictors for empathy ($p < 0.05$) (Table 4).

Discussion

Traditional medical education was didactic classes based on a teacher-centric curriculum. Students were expected to learn over a fixed period and the

graduate was based on summative exams, which assess their knowledge. Despite serving a purpose, there was a lack of attention to attitude, skills and ethics among the present-day doctors, which raises a concern. The newly implemented CBME stresses the multi-domain of medical training with equal address to not only cognitive but also emotional factors. This cross-sectional study aimed to assess and compare empathy among medical UGs with predictor variables with help of the TEQ scale, which has been used priorly on the Indian student population.[14,15]

With progressive advancement of age and semester years of UG course, empathy scores are expected to rise gradually as students get exposed to clinical subjects, focus on clinical management and have patient interactions during ward rotations. In our study, the empathy levels fell from first (M = 46.03) to second year (M = 44.83), peaked at third (M = 46.59) and again dropped at final year (M = 45.52). The rise of empathy score in third year could be associated with the positive effects of start of exposure of clinically oriented subjects being taught but needs further evaluation whereas a decline, especially seen in final-year students could be related to future branch choices just before the entrance exam. But, the empathy scores in our study cross-sectionally could not establish any significance in empathy with respect to age and MBBS year ($p > 0.05$). This finding is quite in coordination with Indian and Western studies.[8,15,17,18] The decline and variability of the findings may be explained with the differences in socio-cultural factors, lack of positive role models, burn-out or the absence of dedicated clinically oriented empathic training. Several authors described other factors that supported unemphatic nature could be lack of time, lack of support from unsympathetic colleagues, personality style, and anxiety toward patients.[19] The declining scores could also be identified with a point of 'settling in' phenomenon when the idealistic scenarios blurs and reality sets in. On comparing, the scores based on their curriculum, those belonging to the old curriculum were exposed to clinical rotation from the second year, whereas their counterparts were exposed from the start as an effort to ingrain compassion and sensitivity at the beginning of academic career. There was a sig-

nificant difference (p < 0.05) on comparing both the empathy levels in students of both curricular types. In 12 and 15 age showed a significant difference in CBME group with declining trend of empathy scores.

In our exploratory analysis, females have higher empathy scores (M = 47.52 *vs*. M = 45.67) which are similar to other studies.[20,21] Women are expected to have a stronger sense of caring, an increased socialization skill, more capable in understanding emotions, genetically inherent ability to extend warmth, compassion with the patient's experiences and feelings, and preference of females to self- report empathetic behavior.[22,23] The gender was significant in both the types of curricula, females outshining males (p < 0.000). The day scholar (M = 46.23 *vs*. M = 45.06) more empathetic and proved to be statistically significant suggesting staying with family members instils moral and psychological support (p < 0.05).[21] Research states the students choosing future specialties with more contact with people should have more empathy scores with a possible explanation that patient- contact was a desirable skill for this kind of specialties and students with higher empathy may naturally prefer such specializations. Hence, the students who chose medicine -oriented specialties had more empathy scores than surgical-oriented ones that concurred with other studies too.[24,25] The mean scores were almost same in our study (M = 45.62 *vs*. M = 45.99) with no overall difference (*p* > 0.05). Change in awareness and perceptions, internship of specialties may change their choice of specialties, hence can be a bias in assessing the effect of changing empathy levels.

Students with history of illness in self and relative had higher mean empathy scores. They could establish their significance only in the CBME group (*p* < 0.05). This fact can be explained by their firsthand experience of care and empathy as a caregiver might substantiate the findings. As stated earlier, the CBME curriculum was introduced to enhance the cognitive and empathetic skills among the future medical professionals, but as per the nature of the findings, such a finding could not be established. Contrasting findings of higher mean empathetic scores in non-CBME students (M = 46.10 *vs*. M = 45.39) suggested no additional skills had yet been incorporated in the CBME group of UGs.

Conclusion

Empathy is a dynamic attribute affected by the emotional, inherent factors and situational perception of well-being. The fluctuating empathy levels was observed throughout the course but declined at end. Female students were more empathetic than male students. CBME curriculum could not make a comparable difference in the empathy levels. But the results obtained are preliminary, and need further detailed assessment after each semester.

Our study is one of its kind to compare the empathy after introduction of the new system of medical training and to assess its correlates. But, a limited number of predictors were assessed, data collected was cross-sectional and unicentric. There arises a future need of longitudinal analytical studies of a single batch at different stages, specially at the final semester to discuss causal associations in relation to the new syllabus for understanding the impact on empathy. Also, qualitative studies such as focus group discussions with teachers, and students can be undertaken to ascertain and delve into understanding other predictors or factors such as stress, burnout, and personality factors, which may be instrumental. Various initiatives like self-directed learning may be recommended for the younger generation to investigate their impact on empathy for catering better service to the community.

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Conflict Of Interest

None

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