Original Article

An Epidemiological Study on Empathy and its Correlates: A Cross-sectional Assessment among Medical Students of a Government Medical College of India

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ABSTRACT

Background: Empathy is a desirable quality in every clinician. It is a crucial determinant of patient–physician communication and relation. There are very few existent Indian studies on empathy of medical students and its correlates. Aim: The aim of the study was to assess empathy level of medical students and its correlates. Methodology: It was a cross-sectional, hospital-based, analytical observational study conducted from July to November 2017. In total, 249 undergraduate medical students of a medical college of Kolkata were interviewed with a structured schedule. The schedule comprised of the sociodemographic questionnaire, career satisfaction, future career choice, and Jefferson Scale of Empathy. Results: The mean empathy score was 98.5 ± 12.5. Third-semester students had higher empathy scores (102.4 ± 12.4) compared to fifth (97.2 ± 12.9) and seventh semester (95.0 ± 10.9) students. The difference between the mean scores of different semesters was statistically significant. Female students were more empathic than male students. In the multivariable linear regression model, sex, semester, residence, career satisfaction, future career choice, and current place of living were significant predictors of empathy scores. Conclusion: Empathy level of medical students of our study was quite low compared to other studies conducted outside India. Empathy eroded with semester, which supports earlier pieces of evidence in this regard.

Key words: Career choice, empathy, medical students

INTRODUCTION

The word “empathy” is derived from Greek word “empatheia” meaning “affection or passion with a quality of suffering.”[1] Hojat defined empathy in the context of patient care as a “predominantly cognitive (rather than an emotional) attribute that involves an understanding (rather than feeling) of the patient’s...
Empathy in medical students is determined by various factors, i.e., age, gender, year of medical education, specialty choice, burn out, quality of life, personality trait, emotional intelligence, and mental health. With the advancement of medical education, empathy is expected to improve. Despite that, various studies had reported empathy erosion of medical students with the advancement of medical training, which is unacceptable. Some stipulated reasons for empathy decline over the years of medical education are less interaction with patients, lack of role models, and academic stress.

It is believed that empathy can be taught and measured. It should be integrated and regularly assessed in various stages of medical education as per recommendations of Association of American Medical Colleges. The student version of the Jefferson Scale of Physician Empathy-S was developed by the researchers associated with Jefferson Medical College in the United States. It was designed explicitly for assessing empathy in medical students.

There are very little published data related to empathy and its correlates of medical students of India. The recent rising trend of violence against doctors in India indicates the existence of some communication gap between doctors and patients. Empathic communication may help to avoid such doctor–patient miscommunications leading to violence. Thus, to intervene at the earliest, it is crucial to find empathy level of doctors and its correlates right from the beginning of their medical education. A prior study in India found a progressive decline in empathy levels with years in medical college. It also reported higher empathy among girls compared to boys. The study failed to demonstrate relationship in between empathy and specialty choice, unlike some Western studies. With this background, the current study was designed to assess empathy level of medical students and its correlates. The results of the study will help policymakers to better understand empathy and its correlates of medical students in the Indian context. The results of the study will help in the efficient planning of interventions and curricular design to produce more empathic doctors in future.

**METHODOLOGY**

It was a cross-sectional, hospital-based, analytical observational study conducted from July to November 2017. In total, 249 undergraduate medical students of a medical college of Kolkata were interviewed with a structured schedule. The schedule comprised of the sociodemographic questionnaire, career satisfaction, future career choice, and Jefferson Scale of Empathy (medical students version). Students of the third, fifth, and seventh semesters were chosen as they were regularly visiting community medicine department for attending classes. Three lecture classes (one for each semester) were selected for data collection in the last week of October 2017. The data were collected within a week’s time to prevent percolation of knowledge related to the responses of the questionnaire and to avoid response bias. In total, 265 students (3rd semester – 96, 5th semester – 92, and 7th semester – 77) attended the said lecture classes. Among 265 students, 16 did not agree to participate, while 249 students (93.9%) (3rd semester-93 [96.8%], 5th semester-86 [93.4%] and 7th semester-70 [90.9%]) gave informed written consent and volunteered to participate in the study.

At first, the study participants were appreciated for their participation in the study. Then, they were briefed by the researcher regarding the purpose and importance of the study. It was followed by obtaining of informed written consent from each of the study participants. Then, the schedule was self-administered by the study participants. Finally, the study participants were thanked for their participation.

In the present study, Jefferson Scale of Empathy (medical students version) was used to assess empathy level of the medical students. It is a 20-item scale having 7 possible responses for each item. The minimum and maximum empathy scores obtained were 67 and 129, respectively, with mean ± standard deviation (SD) of 98.5 ± 12.5. The empathy score was normally distributed as Shapiro–Wilk test \((P = 0.127)\) was not significant.

**Operational definitions used in the study**

**Career satisfaction**

Study participants were asked to indicate their satisfaction with their present career (medical) in a dichotomous response of either “yes” or “no.”
**Future career choice**

Students were asked about their future career choice by an open-ended question. Later on, the answers were divided into “People-oriented” and “Technology-oriented” specialties. People-oriented specialties included: pediatrics, psychiatry, internal medicine, emergency medicine, neurology, obstetrics and gynecology, cardiology, ophthalmology, and dermatology. Technology-oriented specialties included anesthesiology, general surgery, neurosurgery, orthopedic surgery, radiology, pathology, and nuclear medicine. Such categorizations were as per categories used in prior studies.[1,2,3,2']

**Ethical issues**

Ethical clearance from the respective Institutional Ethics Committee was taken before conducting the survey. Similarly, permission of inventor’s Scale of Empathy (© Thomas Jefferson University, 2001. All rights reserved) was obtained before its use in the study. Informed consent of those involved in the study participants was taken before their participation. The data were collected anonymously to assure its confidentiality, during and after its collection.

**Statistical analysis**

Data were analyzed using IBM SPSS (Chicago, USA) (version 16). First, a bivariate analysis with ANOVA, Independent Samples *t*-test, and Spearman rho correlation were done to ascertain the relationship between empathy score and its various attributes. Only those attributes found to be significant were entered into the multiple linear regression model by forced entry method. The strength of association was assessed by unstandardized beta and standard error at 95% confidence interval. Statistical significance for all statistical tests was set at *P* < 0.05.

**RESULTS**

The mean ± SD of the age of the study participants was 20.9 ± 1.2 years. There was a slight male preponderance (58.2%). Most of the samples belonged to an urban area and were satisfied with their family and career choice.

In univariate analysis, third-semester students were having higher empathy scores (102.4 ± 12.4) compared to fifth (97.2 ± 12.9) and seventh semester (95.0 ± 10.9) students. The difference between the mean score of different semesters was statistically significant. Female students were more empathic than male students. Similarly, those who belonged to a rural area, currently living with their family, satisfied with their career choice, and preferred doing people-oriented specialties in future were having significantly higher mean empathy score compared to others [Table 1].

In multivariable model, sex, semester, residence, career satisfaction, future career choice, and current place of living were significant predictors of empathy score adjusted with each other. Age of the study participants was not included in the final model due to its strong correlation (*p* = 0.82) with the semester. The model explained 19% variance of the empathy score [Tables 2 and 3].

Considering the collinearity statistics, variance inflation factor values of all the independent variables were well below 10.0.

**Table 1: Distribution of the study participants according to their background characteristics and empathy scores (n=249)**

| Variable                        | Frequency (%) | Empathy score Mean±SD | *P*  |
|---------------------------------|---------------|-----------------------|------|
| Age (completed years)           |               |                       |      |
| 18-19                           | 35 (14.1)     | 104.6±12.4            | 0.003§|
| 20-21                           | 127 (51.0)    | 98.5±13.0             |      |
| ≥22                             | 87 (34.9)     | 96.1±11.0             |      |
| Sex                             |               |                       |      |
| Male                            | 145 (58.2)    | 96.9±12.0             | 0.017‡|
| Female                          | 104 (41.8)    | 100.7±12.9            |      |
| Semester                        |               |                       |      |
| 3                               | 93 (37.3)     | 102.4±12.4            | <0.001†|
| 5                               | 86 (34.5)     | 97.2±12.9             |      |
| 7                               | 70 (28.1)     | 95.0±10.9             |      |
| Place of residence              |               |                       |      |
| Urban                           | 183 (73.5)    | 97.5±11.8             | 0.046‡|
| Rural                           | 66 (26.5)     | 101±13.9              |      |
| Career satisfaction             |               |                       |      |
| Yes                             | 216 (86.7)    | 99.5±12.2             | 0.001†|
| No                              | 33 (13.3)     | 91.7±12.7             |      |
| Future career choice            |               |                       |      |
| People-oriented                 | 153 (61.4)    | 99.9±11.7             | 0.026†|
| Technical oriented              | 79 (31.7)     | 96.3±13.5             |      |
| Others/undecided                | 17 (6.9)      | 95.1±15.7             |      |
| Currently living                |               |                       |      |
| With family                     | 101 (40.6)    | 99.6±11.3             | 0.023†|
| Hostel                          | 133 (53.4)    | 98.6±13.6             |      |
| Rent                            | 15 (6.0)      | 90.2±6.9              |      |

Table 2: Spearman rho correlation matrix showing various correlates of empathy of the study participants (n=249)

| Age* | Sex† | Sem‡ | Res§ | Car¶ | Fut||| | Liv¶ | Emp** |
|------|------|------|------|------|-----|--|--|--|--|--|
| 1.00 | 0.00 | -0.05| 1.00  | 0.00 | 0.04| -0.04| -0.04| -0.16| 0.22 |
| -0.05| -0.05| 1.00  | 0.00 | 0.05 | 0.05| 0.05 | 0.05 | 0.07 | 0.07 |
| -0.05| -0.04| -0.04| 1.00  | 0.05 | 0.05| 0.05 | 0.05 | 0.07 | 0.07 |
| -0.04| -0.02| -0.02| 0.00  | 1.00  | 0.00| 0.00 | 0.00 | 0.00 | 0.00 |
| -0.16| -0.12| -0.12| -0.04| -0.04| 1.00| 0.00 | 0.00 | 0.00 | 0.00 |
| 0.22 | 0.20 | 0.20 | 0.18 | 0.18 | 0.18| 0.18 | 0.18 | 0.18 | 0.18 |

*Age (increasing); †Sex (female); ‡Residence (rural); ¶Career satisfaction (yes); §Future career choice (people oriented); ||Living with (family); **Empathy score (increasing); ††Correlation is significant at the 0.05 level; ‡‡Correlation is significant at the 0.01 level
With the advancement of medical education, which other hand, Santos Khademalhosseini had similarities with findings of Benabbas et al. The mean empathy level of undergraduate medical students in the current study was 98.5. It was quite low compared to studies conducted by Santos et al., Mostafa et al., Bangash et al., and Wen et al. On the other hand, the study conducted by Benabbas et al. reported no significant association between gender and empathy. It had been observed that women tend to better elicit the emotional status of a patient compared to men. Besides, women are more skilled in developing interpersonal relationships with patients. These may be the reasons for such observation in our study.

In the current study, students who belonged to a rural area had significantly higher empathy score. There are only limited pieces of prior evidence in this regard. A study conducted in Columbia among nursing students reported findings similar to ours. It may be because students who belong to a rural area are more likely brought up in an environment where social cohesion exists between neighbors and people are more of helping nature. Thus, they are expected to be better communicators. This may have resulted in better empathy scores in the later course of their lives. Similarly, those who were currently living with their family were more empathic. The possible explanation could be, family members’ moral and psychological support may have helped in the reduction of their academic stress.

Those who were satisfied with their career had more empathy score. It may be because those who were not satisfied with their medical career were likely to be suffering from frustration to distress. This may have resulted in an erosion of their empathy and vice versa.

In the present study, those who preferred to do people-oriented specialties in future had more empathy score. This was concordant with the findings of Santos et al. and Raof et al. On the other hand, Benabbas et al., Mostafa et al., and Magalhaes et al. did not find such association between specialty choice and empathy. The possible explanation could be, people-oriented specialties require more patient contact. Hence, empathy is a desirable skill for this kind of specialties. In addition, students with higher empathy may naturally prefer to do specializations that require more patient contact.

## DISCUSSION

The study was a hospital-based cross-sectional analytical observational study which explored empathy level of undergraduate medical students and its correlates.

The mean empathy level of undergraduate medical students in the current study was 98.5. It was quite low compared to studies conducted by Santos et al., Quince et al., Mostafa et al., and Wen et al. Empathy level of medical students in the current study was similar to the findings of Shashikumar et al. and Benabbs et al. The variability of the findings may be due to differences in cultural factors, custom, ethnicity, spiritual belief, and educational system.

With the advancement of age, empathy level of medical students eroded. It was in concordance with the study conducted in Iran by Khademalhosseini et al. but discordant with the findings of Bangash et al. Mean empathy score was also found to be declined with the advancement of medical education, which had similarities with findings of Benabbs et al., Khademalhosseini et al., and Wen et al. On the other hand, Santos et al., Bangash et al., and Imran et al. did not find such association between semester and empathy score. The reason for empathy erosion with the semester in the current study may be that, during data collection, fifth and seventh-semester students had their semester examinations within a month’s time. Hence, examination-related stress may have influenced the results of our study as stress is a well-known cause of empathy erosion.

Female medical students had higher empathy scores. It was similar to the findings of Santos et al., Raof and Yassin, Quince et al., Youssef et al., Mostafa et al., Bangash et al., Wen et al., and Dehning et al. On the other hand, the study conducted by Benabbs et al. reported no significant association between gender and empathy. It had been observed that women tend to better elicit the emotional status of a patient compared to men. Besides, women are more skilled in developing interpersonal relationships with patients. These may be the reasons for such observation in our study.

In the present study, those who preferred to do people-oriented specialty in future had more empathy score. This was concordant with the findings of Santos et al. and Raof et al. On the other hand, Benabbs et al., Mostafa et al., and Magalhaes et al. did not find such association between specialty choice and empathy. The possible explanation could be, people-oriented specialties require more patient contact. Hence, empathy is a desirable skill for this kind of specialties. In addition, students with higher empathy may naturally prefer to do specializations that require more patient contact.

## Strengths

The study was one of the fewer studies in India which assessed empathy level of medical students and its correlates. It enriched the existing literature in this aspect.

### Table 3: Multiple linear regression analysis showing predictors of empathy of the study participants (n=249)

| Variables                        | Unstandardized coefficients | 95.0% CI for B* | Lower bound | Upper bound |
|----------------------------------|-----------------------------|----------------|-------------|-------------|
| Age in completed years (increasing) | -                          | 0.022          | 0.5         | 6.4         |
| Sex (female)                     | 3.4                         | 0.4            | -2.4        | -0.7        |
| Semester (increasing)            | -1.5                        | 0.001          | 0.8         | 7.5         |
| Residence (rural)                | 4.2                         | 0.011          | 0.9         | 6.8         |
| Career satisfaction (yes)        | 7.3                         | 0.001          | 3.1         | 11.6        |
| Future career choice (people oriented) | 3.9                         | 0.011          | 0.9         | 6.8         |
| Currently living (with family)   | 5.8                         | <0.001         | 2.7         | 9.0         |

*B Unstandardized beta, *Not included in the model due to multicollinearity with semester (ρ=0.82). SE – Standard error; CI – Confidence interval
The sample size was small. All the data were self-reported by study participants. Data were not cross-verified. Thus, there may be over- or under-reporting, and chances of social desirability bias cannot be overlooked. Medical students’ future specialty choice showed significant correlation with their empathy score. The findings were merely based on their current specialty choice, which may change with their progress in medical education. There may be other specific, vital determinants of empathy, such as psychological morbidities, which we did not examine. Further, longitudinal study design assessing empathy across semesters could probably better report empathy erosion rather than a cross-sectional study design.

**CONCLUSION**

Empathy level of medical students of our study was quite low compared to other studies conducted outside India. Empathy eroded with semester, which supports earlier shreds of evidence in this regard. Gender and future career choice were important determinants of empathy score. The medical curriculum should give more focus to the promotion of empathy and other humanistic values among the medical students. This would enable them to serve humanity in a better way in the future.

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**Conflicts of interest**

There are no conflicts of interest.

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