ORIGINAL ARTICLE
Journal of Science Technology Education Art and Medicine
DOI: 10.63137/jsteam.297463

Level of Empathy Amongst Undergraduate Medical and Dental Students in India: A Cross-sectional Study

Shazia Zainab[a]

[a]Career Postgraduate Institute of Dental Sciences and Hospital, Lucknow, India

*Corresponding address: *Career Postgraduate Institute of Dental Sciences and Hospital, Lucknow, India*
Email: zainab.sana13@gmail.com

Received: 15 October 2024 / **Revised:** 17 December 2024 / **Accepted:** 19 December 2024 / **Available Online:** 21 December 2024

ABSTRACT

Objective: The aim of the study is to measure the levels of empathy amongst undergraduate dental and medical students across various universities in India, exploring factors that influence these levels to provide insights into enhancing empathy training in healthcare education.
Methods: A descriptive cross-sectional study was conducted with 926 students from government and private medical and dental colleges in India. The Jefferson Scale of Empathy (JSE) was used to measure clinical empathy. Data were analyzed using SPSS version 20, with t-tests and ANOVA applied to assess associations between empathy levels, demographics, academic years, and specialty preferences. Pearson's χ^2 test was used for further comparisons.
Results: The overall mean empathy score was 102.8 ± 15.9, with higher scores in female students (104.8 ± 14.9) than males (91.4 ± 19.4). Empathy scores were highest among fourth-year students, while second-year students and those beyond the fourth year had the lowest. Higher scores were observed in students preferring people-oriented specialties, such as pediatrics and internal medicine.
Conclusion: While most nursing students exhibited good awareness of therapeutic communication, a notable proportion displayed knowledge gaps. The findings emphasize the need for targeted communication training and curricular modifications in nursing programs to enhance therapeutic communication skills and improve patient care outcomes.
Keywords: Cross-Sectional Study; Dental Students; Empathy; Indian Healthcare; Medical Education

Citation: Zainab S. Level of empathy amongst undergraduate medical and dental students in India: a cross-sectional study. J Sci Technol Educ Art Med. 2024;1(2):21-25

Introduction

Empathy is increasingly recognized as critical in healthcare education and patient care. [1] However, the ambiguity in defining empathy and the insufficiency of robust tools for psychometric evaluation in specific educational contexts have contributed to the limited empirical research on empathy levels among healthcare students. Empathy has garnered attention not only within healthcare but also across fields such as politics, media, arts, business, ethics, and academia [2], emphasizing its significance in the tutelage and professional development of healthcare providers.

Research has identified stress and distress as major factors influencing empathy levels among medical students, interns, and residents. [3] While students typically enter medical school with high levels of idealism, compassion, and enthusiasm, a decline is often observed as they encounter the harsh realities of clinical practice, such as the severity of diseases, the suffering of patients, and death. This exposure can lead to transference in focus from the humanistic and compassionate

aspects of medicine to a more technical and objective approach. [4]

Empirical studies examining empathy levels in medical students within the Indian context are still limited. One study organized in India explored the components accompanying empathy among students in medical schools and determined that female participants had significantly higher empathy scores compared to their male counterparts. [5] However, no significant associations were found between empathy levels and other factors such as age, choice of specialty, place of residency, or the motivation behind enrolling in the undergraduate program. [6]

The current research aims to measure the degree of empathy of undergraduate medical and dental students across various universities in India, both private and government. By exploring the factors influencing empathy levels in this diverse student population, the study seeks to provide insights into the empathy dynamics within Indian healthcare education and identify opportunities for enhancing empathy training in medical and dental curricula.

Materials and Methods

Study Design, Setting, and Participants

This descriptive cross-sectional study was conducted over six months (15 May 2023–15 October 2023) across several medical and dental colleges in India, including both government and private institutions. Following approval from the Institutional Review Board (Reference No. 0110721MNY5), the sample size was calculated at a 5% margin of error with a 95% confidence interval, anticipating differences in mean empathy scores based on gender and academic year. A non-probability convenience sampling technique was employed for participant recruitment. The study surveyed 926 undergraduate medical and dental students recruited in various non-identical years of their academic programs to capture the empathy levels across both preclinical and clinical years. Data on demographics and empathy levels were collected using a self-administered questionnaire. Informed consent was obtained from all participants before data collection.

Measurement Tool

The Jefferson Scale of Empathy (JSE) was utilized in this study to assess levels of clinical empathy among medical and dental students at an undergraduate level. [7] The entire scale was formed online on Google Forms and distributed to students through their official email IDs and WhatsApp groups. The first part of the online form consisted of information about the study, its protocol, voluntary participation information, and a statement of informed consent. The second part inquired about demographic information from the students including gender, age, year of study, and field of study (medicine/dentistry). The last part was the JSE scale. The JSE, a validated self-administered tool developed in 2001, consists of 20 items designed to measure three components: compassionate care, walking in the patient's shoes, and perspective-taking. The overall score span of the JSE is 20–140, with questions framed both positively and negatively. Participants responded using a Likert scale, where '1' signified 'strongly disagree' and '7' indicated 'strongly agree.' The full form was validated by 3 experts in the field and piloted on 10 students before data collection. Data was collected in 3 waves, giving reminders to participants after every 30 days. Duplicate forms were not considered, and all questions were mandatory to answer to avoid any missing data.

Statistical Methods

Data analysis was conducted using SPSS version 20. The relationship between empathy scores and the advancing academic year was examined using an analysis of variance (ANOVA). Post-hoc Tukey's tests were performed to further investigate the differences in empathy scores by academic year. Additionally, independent t-tests were conducted to assess the association between mean empathy scores and variables such as gender and age group. Empathy scores were categorized as below average or above average for comparative analysis with demographic data using Pearson's χ^2 test. A p-value of ≤ 0.05 was considered statistically significant.

Results

Of the 926 participants in this study, 81.5% (n=755) respondents were females, and 18.5% (n=171) males took part. Among the 926 dental and medical students surveyed, 60.2% (n=557) were in the age group of 22–24 years, while the remaining 39.8% (n=369) were under 22 years old. Of the total participants, 55.3% (n=513) were medical students

(Table 1). Their specialty preferences were distributed as General Surgery 22.4% (n=115), anesthesia: 9.2% (n=47), general medicine: 21.3% (n=109), cardiology: 16.8% (n=86), neurosurgery: 8.3% (n=43), oncology 9.8% (n=50) and plastic surgery 12.2% (n=63).

The remaining 44.7% (n=413) were dental students. Their specialty preferences were categorized as periodontology: 11.6% (n=48), orthodontics: 12.6% (n=52), oral Surgery: 10.9% (n=45), prosthodontics: 9.7% (n=40), oral medicine 11.6% (n=48), and operative dentistry 12.7% (n=52) (Table 2). The overall mean empathy score for all participants was 102.8 ± 15.9.

Table 1: Demographic characteristics of participants

Field of Specialty	Medical (n=513)	Dental (n=413)
Age		
Under 22 years	205	164
22-24 years	308	249
Gender		
Male	96	76
Female	417	337

Table 2: Specialty preferences of participants

Medical Students			
Specialty Preference	**Females (n=417)**	**Males (n=96)**	**Total (n=513)**
General Surgery	93	22	115
Anesthesia	38	09	47
General Medicine	89	20	109
Cardiology	70	16	86
Neurosurgery	35	08	43
Oncology	41	09	50
Plastic Surgery	51	12	63
Dental Students			
Specialty Preference	**Females (n=337)**	**Males (n=76)**	**Total (n=413)**
Periodontology	75	11	86
Orthodontics	41	15	56
Oral Surgery	45	19	64
Prosthodontics	38	10	48
Oral Medicine	59	9	68
Operative Dentistry	79	12	91

Empathy Scores and Associations

The mean empathy score for participants aged under 22 years was 103.8 ± 14.2, while those aged 22–24 years had a mean score of 100.9 ± 17.6. This distinction was not statistically remarkable (P=0.080) according to a t-test analysis. Female participants had a higher mean empathy score i.e. 104.8 ± 14.9, compared to males who had a mean score of 91.4 ± 19.4, a statistically significant difference (P=0.000) according to the t-test.

The greatest empathy levels were noted among fourth-year students, who had a mean total score of 104.9 ± 15.5, subsequently, third-year students with a mean score of 102.4 ± 14.5 took the second spot. The lowest scores were recorded for second-year students (101.2 ± 10.5) and for students beyond fourth year (99.3 ± 18.9). When ANOVA was applied to compare empathy scores across different academic years, no statistically significant difference was found between any specific year groups (P=0.085). The consortium of mean empathy scores with year of study, gender, and age group is summarized in Table 3.

Table 3: Association with Mean Empathy Score

	Empathy Score (Mean ± SD)	***P*-value**
Age		
< 22	103.8 ± 14.2	0.08
22-24	100.9 ± 17.6	
Gender		
Female	104.8 ± 14.9	0.00*
Male	91.4 ± 19.4	
Years of training		
2nd year	101.2 ± 10.5	0.085
3rd year	102.4 ± 14.5	
4th year	104.9 ± 15.5	
5th year	99.3 ± 18.9	

Note: * *means statistically significant*

Two groups were formed to categorize the scores as: above-average (score ≥ 102) and below-average (score < 102). The connection between these categories and variables such as age, gender, academic year, and specialty preference was found by using Pearson's χ^2-test. Among students under 22 years of age, 65% had above-average empathy scores, while 55.8% of those aged 22–24 years scored above average. Of these, 68.4% of females scored higher empathy points compared to 30.9% of total males. The greater number of fourth-year students (73.8%) had above-average scores, while

third-year students (53.6%) secured the second place followed by those beyond the fourth year (49.2%), while only 37.6% of students in the second year had above-average scores. Regarding specialty preferences:

Medical Students: 100% (n=15) of the students who chose family medicine and orthopedic surgery ended up with below-average scores, and 81% (n=35) of students interested in neurosurgery. All students who chose neurology, emergency medicine, oncology, and obstetrics/gynecology had average or above-average empathy scores. Higher scores were noted in those pursuing pediatrics (70.2%, n=88), internal medicine (66.1%, n=130), and general surgery (64.9%, n=113).

Dental Students: Scores of below-average ratings were recorded for 78% (n=28) of those interested in orthodontics and 83% (n=37) of those choosing oral surgery. Students specializing in periodontology and prosthodontics had higher empathy scores, with 71.5% (n=34) and 67.2% (n=31), respectively, scoring above average. All associations between the variables and empathy scores were statistically significant.

Discussion

This study aimed to assess levels of clinical empathy amongst undergraduate medical and dental students in India, examining associations with the study year and career specialty predilection. A total of 926 students participated, with empathy levels generally higher among female students compared to their male counterparts. Notably, fourth-year students demonstrated the highest levels of empathy, while students of other academic years, particularly second and final-year students, had lower empathy scores. The study also highlighted that students with career preferences in people-oriented specialties, such as pediatrics, emergency medicine, internal medicine, obstetrics/gynecology, neurology, and oncology, exhibited higher empathy scores.

The general mean of empathy scores was found to be 102.8 ± 15.9. This score, while consistent with some regional studies, is lower than those reported in international studies, which typically range from 104 to 110. These differences may be attributed to variations in sampling methodologies, cultural definitions of empathy, and educational practices. Medical and dental institutions across countries have different admission criteria and curricula influenced by their cultural and traditional norms, potentially affecting levels of empathy among students. [8]

In this study, levels of empathy were highest amongst students in the fourth-year, consistent with international findings that suggest a dip in empathy after clinical exposure, followed by a slight increase as students approach the later stages of their training. [9, 10] The lowest empathy scores observed among second and final-year students may be related to the increasing academic and clinical workload, stress, and inadequate sleep patterns, which have been shown to negatively impact empathy levels in medical students. [11]

Female students demonstrated significantly higher empathy levels compared to males, with a mean score of 105.2 ± 14.5 compared to 90.6 ± 19.1 in males. This finding aligns with previous studies conducted in India, which also report higher empathy levels in female medical students. [12] A possible explanation could be that female students may be less affected by factors contributing to diminished empathy. Moreover, younger students (under 22 years) had higher empathy levels than their older peers (22–24 years), consistent with literature suggesting that empathy declines with age due to reduced life satisfaction. [13]

Medical and dental specialties can be openly classified into technology-oriented and people-oriented fields. This study showed that students choosing people-oriented specialties such as internal medicine, pediatrics, and obstetrics/gynecology had greater empathy levels than those opting for more technology-focused specialties. These findings mirror those from international studies, such as a 2016 cross-sectional study in Brazil, which also reported higher empathy levels in students selecting people-oriented fields. [14] Comparing these findings with previous studies conducted in India and other regions reveals some differences. While the current study observed the greatest levels of empathy in students in the fourth year, studies from Saudi Arabia and other regions reported that empathy levels peaked earlier in the second year. [15] These variations may reflect differences in clinical exposure, curriculum structure, and cultural influences in medical and dental education across countries. The results emphasize the need for increased emphasis on empathy education and training in Indian medical and dental schools to develop more empathetic healthcare professionals.

This study also illustrates how empathy levels vary with academic progression, gender, and career preferences, offering insight into empathy trends among Indian medical and dental students. These insights highlight the necessity of integrating empathy development into the curriculum to ensure

a supportive and humanistic healthcare environment.

There are several limitations to this study. First, the design is cross-sectional and the potential for bias due to social desirability might have influenced the responses gathered via the questionnaire. Longitudinal studies that follow a smaller group of students over time would provide more robust data on empathy trends. Second, the reliance on self-reported measures may not accurately reflect the actual empathetic behavior of students in clinical settings. Additionally, this study did not account for religious beliefs, which can significantly influence views on human suffering, life, and death, and may be closely tied to empathy and spirituality.

Future research should investigate the impact of empathy skills training on students' career preferences and explore whether incorporating empathy development into the medical and dental curriculum can influence these preferences. Such findings could guide the implementation of regionally relevant strategies to enhance empathy in healthcare education.

Conclusion

This study highlights the variability of empathy levels among Indian medical and dental students, with higher scores observed in females, fourth-year students, and those pursuing people-oriented specialties. The findings emphasize the need for integrating structured empathy training into curricula to address empathy decline caused by academic stress and clinical workload. Future research should focus on longitudinal studies and targeted interventions to foster empathy and cultivate a more compassionate healthcare workforce.

Author Contribution

SZ conceived the idea, collected and analyzed the data, validated the results, drafted, and proofread the finalized manuscript.

Data Availability Statement

All relevant data are within the manuscript. Additional data supporting this study are available from the corresponding author upon reasonable request.

Funding

Self-funded research.

Conflict of Interest

None

References

1. Moudatsou M, Stavropoulou A, Philalithis A, Koukouli S, editors. The role of empathy in health and social care professionals. Healthcare; 2020: MDPI.
2. Edmondson J, Formica P, Mitra J. Empathy, sensibility and graduate employment–Can the humanities help? : SAGE Publications Sage UK: London, England; 2020. p. 223-9.
3. Maximiano-Barreto MA, Fabrício DdM, Luchesi BM, Chagas MH. Factors associated with levels of empathy among students and professionals in the health field: a systematic review. Trends in psychiatry and psychotherapy. 2020;42(2):207-15.
4. Laughey WF, Atkinson J, Craig AM, Douglas L, Brown ME, Scott JL, et al. Empathy in medical education: its nature and nurture—a qualitative study of the views of students and tutors. Medical science educator. 2021;31:1941-50.
5. Surchat C, Carrard V, Gaume J, Berney A, Clair C. Impact of physician empathy on patient outcomes: a gender analysis. British Journal of General Practice. 2022;72(715):e99-e107.
6. Naseem M, Tahir B, Salman A, Qadir S, Farhan R, Ali S, et al. Empathy levels among undergraduate medical students in Karachi, Pakistan: a cross-sectional study. Annals of Medicine and Surgery. 2023;85(8):3858-62.
7. Williams B, Beovich B. A systematic review of psychometric assessment of the Jefferson Scale of Empathy using the COSMIN Risk of Bias checklist. Journal of evaluation in clinical practice. 2020;26(4):1302-15.
8. Al-Worafi YM, Ali SM. Curriculum reform in developing countries: dentistry education. Handbook of Medical and Health Sciences in Developing Countries: Education, Practice, and Research: Springer; 2024. p. 1-27.
9. Iqbal S, Bilal K, Ahmad W, Nazir U, Javed Z, Khan S, et al. Empathy among medical students: A cross-sectional survey. Journal of Ayub Medical College Abbottabad-Pakistan. 2020;32.
10. Brekalo Prso I, Mocny-Pachońska K, Trzcionka A, Pezelj-Ribaric S, Paljevic E, Tanasiewicz M, et al. Empathy amongst dental students: An institutional cross-sectional survey in Poland and Croatia. European journal of dental education. 2020;24(4):687-94.
11. Roling G, Lutz G, Edelhäuser F, Hofmann M, Valk-Draad MP, Wack C, et al. Empathy, well-being and stressful experiences in the clinical learning environment. Patient Education and Counseling. 2020;103(11):2320-7.
12. Akgün Ö, Akdeniz M, Kavukcu E, Avcı HH. Medical students' empathy level differences by medical year, gender, and specialty interest in Akdeniz University. Journal of Medical Education and Curricular Development. 2020;7:2382120520940658.
13. Pollerhoff L, Stietz J, Depow GJ, Inzlicht M, Kanske P, Li S-C, et al. Investigating adult age differences in real-life empathy, prosociality, and well-being using experience sampling. Scientific Reports. 2022;12(1):3450.
14. Yasien S, Almuzaini F. The relationship between empathy and personality traits in Saudi medical students. Journal of Education and Health Promotion. 2022;11(1):150.
15. Abdulrahman KAB, Alsharidah MA, Alobaida BA, Alabbadi YN, Almohsen FI, Abahussain TA, et al. Empathy level among Saudi medical students using the Toronto empathy scale. Middle East Journal of Family Medicine. 2022;7(10):172.