

A Quantitative Study of Empathy in Pakistani Medical Students: A Multicentered Approach

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Abstract

Objective: To examine the empathy level of undergraduate medical students in Pakistan. Three hypotheses are developed based on the literature review. (1) Female medical students have a higher level of empathy than do male students. (2) Empathy scores vary during the medical school years in Pakistani students. (3) Medical students interested in people-oriented specialties would score higher than the students interested in technology-oriented specialties. **Methods:** This is a quantitative inquiry approach using a cross-sectional design of 1453 students from 8 Pakistani medical schools, both private and state. The sample consists of 41.1% (n = 597) male students and 58.9% (n = 856) female students. Empirical data are collected using the Jefferson Scale of Physician Empathy (JSPE), a well-validated self-administered questionnaire. **Results:** The mean empathy score among students is 4.77 with a standard deviation of 0.72. The results show that there is no statistically significant association between the empathy scores and gender, $t(1342.36) = -0.053, P = .95$. There is a statistically significant difference between the empathy scores and the years of medical school, $F(14, 1448) = 4.95, P = .01$. Concerning the specialty interests, there is no statistically significant difference between the empathy score and specialty interests. **Conclusion:** The findings of this study showed that in Western countries, medical students performed better than Pakistani medical students on the empathy scale. This finding has important implications for Pakistani medical educators to improve the interpersonal skills of medical students in the context of patient care. Inconsistent with our expectations and experiences, our findings do not support that female medical students scored better than their male counterparts on the empathy scale. Because of the nature of a cross-sectional study, it is impossible to argue the decline of empathy during medical school training.

Keywords

empathy, gender, specialty interest, medical school, medical student

Introduction

Empathy is the DNA of professionalism in medicine. The Association of American Medical Colleges has emphasized the importance of empathy in patient-doctor relationships by stating that “physicians must be compassionate and empathetic in caring for patients, and must be trustworthy and truthful in all of their professional dealings.”¹ Also, it has been recommended that empathy should be integrated and assessed within residency training program.² Empathy researchers have defined the construct of empathy in different angles, both psychologically and neurologically.³ It is either an emotional domain or a cognitive domain, or a combination of both. Under a cognitive domain, it has been defined as “the imaginative transposing of oneself into the thinking, and acting of another and so structuring the world

as he does.” From an emotional domain, it has been defined as “experiencing the emotional state of another.”⁴⁻⁷ In the context of patient care, there is a variation of definition of empathy, for example, it refers to “the ability of physicians to imagine that they are the patient who has come to them for help,”⁸ or it has been said “I have to let a part of me become the patient, and I have to go through her experience as if I were the patient.”⁹ The psychometric literature shows

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that empathy follows a multidimensional model involving 3 domains of “perspective taking,” “compassionate care,” and “standing in the patient’s shoes.” These domains are mapped to empathic engagements in patient care.³ Neurologically, it has been argued that empathy is expressed as the result of different “mirror matching mechanisms” in our brain. A mirror neurone system allows us to put ourselves in the “mental shoes” of others (see Hojat³ for further details of neuroglial underpinnings of empathy).

Empathy is a critical construct in the context of the doctor-patient relationship. Wilmer¹⁰ stated, “the failure to empathise is the basis of the unhappy doctor-patient relationships.” It has been well documented that there is a theoretical link between empathy and positive short- and long-term patient outcomes.³ The medical communication literature shows that the effective doctor-patient communication can improve patient satisfaction, patient empowerment, autonomy, compliance, and adherence, and minimize doctor’s fear of legal actions.¹¹⁻¹⁴ Some studies show the association between empathy and psychotherapy. For example, a study shows that a low therapist empathy is “toxic” to patient outcomes and has a relationship with “higher drop-out and relapse rates, weaker therapeutic alliance and less client change.”¹⁵ A study showed that the empathic understanding of pain improves the relationship between doctor and patient.¹⁶ Regarding doctor empathy and clinical patient outcomes, independent of the subjective interpretations of patients, 2 studies, from the United States and Italy, show that patients control their diabetes well when their doctors have received a high score on the empathy scale. Another study, with a very large sample size, shows that there is a relationship between the scores of doctors on the empathy scale and the low-density lipoprotein cholesterol levels in patients with diabetes.^{17,18}

Many studies have been conducted to measure the empathy level among medical students scientifically and its association with some independent variables, for example, gender, medical year, and choice of specialty. The link between empathy and these independent variables are well documented.³ The vast majority of studies show that women performed better than men on the measures of empathy.¹⁹⁻²⁶ However, some studies did not support the hypothesis that women outscore men on the empathy scores.²⁷⁻³⁰

Some studies showed that enthusiasm, humanitarianism, and idealism were declined among students.³¹⁻³³ The phenomenon of declining humanitarianism feeling in medical students was uncovered in a follow-up study about 60 years ago indicating that medical students, as they progressed through medical school years, were significantly less humanitarian than law students, and freshman nursing students were significantly more humanitarian than senior nursing students.³⁴ In recent studies, some studies have shown that empathy was declined as medical students progress through years of medical school.^{35,36} The decline of empathy was also explored in postgraduate medical education.^{37,38} Additionally,

the results of some cross-sectional studies show that the empathy scores diminished during medical and dental school.^{21-23,28} However, a study in Japan showed that the empathy scores are increased as medical students progress years of medical school.¹⁹

The other variable that has a link with empathy is medical students’ specialty choice. Predicting specialty ambition based on empathy can influence the distribution of doctors in different specialties.³ A comparison study showed that there is a link between the empathy scores and career ambition. In this study, students with a major in education, psychology, and medicine scored better than engineering and architecture students on the empathy scale.³⁹ The results of cross-sectional studies in medical schools show that those who are interested in “people-oriented specialties” (eg, family medicine, pediatrics, internal medicine, etc) scored better than “technology-oriented specialties” (eg, radiology, surgery, etc).^{20,21,24} However, some studies did not support the relationship between empathy scores and specialty interest.^{40,41}

Despite the importance placed on the empathic doctor-patient relationship for improving health care outcomes, little is formally known about the medical students’ empathy orientation or attitudes toward empathetic relationships in the context of patient care in Pakistan. This is considered to be so because little attention has been paid to the improvement of empathy and interpersonal relationships in the undergraduate medical education curriculum. Therefore, we felt that it is necessary to uncover the empathy level among undergraduate medical students in Pakistan to provide evidence-based lessons for educational policymakers to improve the quality of the empathic curriculum in undergraduate medical education, effective doctor-patient communication and health outcomes. Therefore the aim of this quantitative research study is to measure empathy among medical students in the context of patient care. To achieve this purpose, we have conducted a comprehensive literature review to formulate our research hypotheses. Therefore, based on the previous research studies, the 3 directional hypotheses directing this study are as follows:

Hypothesis 1: Female medical students have a higher level of empathy than do male students.

Hypothesis 2: Empathy levels vary during the medical school years in Pakistani students.

Hypothesis 3: Medical students who prefer people-oriented specialties would score better than the students who prefer technology-oriented specialties.

Methods

Study Design and Participants

A multicenter, cross-sectional study design was carried out to measure the empathy scores of Pakistani medical

Table 1. Descriptive Statistics of Demographic Variables (n = 1453).

Variable	Frequency, n	Percentage
Medical school		
A (public)	190	13.1
B (private)	336	23.1
C (public)	248	17.1
D (public)	124	8.5
E (public)	126	8.7
F (public)	138	9.5
G (private)	91	6.3
H (private)	200	13.8
Gender		
Female	856	58.9
Male	597	41.1
Medical year		
Year 1	511	35.2
Year 2	271	18.7
Year 3	330	22.7
Year 4	195	13.4
Year 5	146	10.0
Specialty interest		
People oriented	648	44.6
Technology oriented	545	37.5
Undecided	260	17.9

students. This study was conducted in 8 medical schools in Pakistan and Azad Jammu Kashmir. Four of the schools were private, and 4 were state-funded. The study participants consisted of 1453 male and female Pakistani medical student from all 5 years of medical school during the academic year 2015-2016. Specialty interest was categorized into people-oriented specialties (related to the internal medicine, psychiatry, preventive medicine, dermatology, paediatrics, and obstetrics and gynaecology), technology-oriented specialties (related to the surgical area and specialties such as ophthalmology, otorhinolaryngology, anaesthesia, radiology, and pathology), and undecided.³ Table 1 shows the demographic data of the study participants.

Ethical Considerations

Before gathering data, permission from the Jefferson Medical College at Thomas Jefferson University was sought to use the scale. Ethical approval to carry out this study was obtained from the ethics committee and institutional review board of the University of Nottingham as well as the Shifa College of Medicine Pakistan. The purpose of the study was described for the participants. Anonymity and confidentiality were maintained. The right to self-determination was included (the participants had the right to ask questions, to refuse to give information, and to withdraw from the study without risking penalty). Returning a filled questionnaire

meant the participants had adequate information about the study and had the power of free choice.

Data Collection Method

The JSPE was used to measure the empathy scores of medical students. It has 20 items, which take 5 to 10 minutes to complete. It has 7 response alternatives on a continuum from strongly agree to disagree strongly. A score of 7 was given for strongly agree, 6 for agree, and so on. The data collection was carried out either through web or paper, depending on the availability of the institutional resources. The internal consistency reliability of the test scores was .74 using Cronbach's alpha.

Statistical Analysis

Descriptive and inferential statistics were used to address the JSPE scores and to test the hypotheses raised in the introduction. Inferential statistics were performed using the mean scores (out of 7) for each participant. This differs from the traditional way of giving the sum of item scores, which is not recommended.⁴² However, to compare the results with those reported in the literature using the sum of item scores, the reader could multiply the average of item scores by 20. The *t*-test and 2-way analysis of variance (ANOVA) were conducted to explore the association between the dependent and independent variables. Tukey's test was used to compare each pair of the means if their differences were statistically significant. To measure the association of gender, medical school year and career aspirations on the JSPE scores, and to examine the interaction between these variables, a 3-way ANOVA between-group analysis of variance was carried out. A *P* value less than 5% is considered statistically significant. Finally, data were analyzed using SPSS.

Results

The mean and standard deviation of the JSPE scores in medical students (N = 1453) was 4.77 and 0.72, respectively. The JSPE item means and standard deviations ranged from 5.48 to 3.25, and 2.14 to 1.52, respectively.

Testing Hypotheses

Hypothesis 1. The Welch *t*-test was conducted to compare the JSPE scores for males and females students (N = 1453). There was no significant difference, $t(1342.36) = -0.053$, $P = .95$, in the JSPE scores for males (mean = 4.77, SD = 0.60) and females (mean = 4.77, SD = 0.73). These results do not support that female students outperform male students. Table 2 presents the means and standard deviations.

Table 2. The Association Between the Jefferson Scale of Physician Empathy Scores and Demographic Information (N = 1453).

Variable	n	Mean	Median	SD	Min	Max
Gender						
Female	856	4.77	4.75	0.73	2.65	6.80
Male	597	4.77	4.80	0.60	3.20	7.00
Medical year						
Year 1	511	4.86	5.00	0.61	3.25	6.60
Year 2	271	4.75	4.65	0.68	3.45	6.80
Year 3	330	4.77	4.65	0.80	2.65	7.00
Year 4	195	4.65	4.55	0.73	3.25	6.20
Year 5	146	4.63	4.40	0.80	3.25	6.80
Specialty interest						
People oriented	648	4.77	4.82	0.72	2.75	7.00
Technology oriented	545	4.78	4.80	0.69	2.65	6.8
Undecided	260	4.76	4.65	0.74	3.35	6.6

Hypothesis 2. A 1-way ANOVA was performed to compare the JSPE scores between the medical school years. There was a statistically significant difference, at the $P < .05$ level, in the JSPE scores for the 5 medical year groups, $F(14, 1448) = 4.95$, $P = .01$. Despite achieving statistical significance, the magnitude of JSPE scores between groups (year 1 to year 5) was very small (effect size = 0.01). Postcomparison using the Tukey test showed that the JSPE scores for year 1 were significantly different from year 4 and year 5. Table 2 presents the means and standard deviations.

Hypothesis 3. A further 1-way ANOVA was performed to compare the JSPE between specialty interests. Table 2 presents the means and standard deviations. There was no statistically significant difference, at the $P < .05$ level, in the JSPE scores for the 3 specialty interests, $F(2, 1450) = 0.48$, $P = .93$.

To reveal whether there is a 3-way interaction between 3 independent variables (ie, gender, medical year, and specialty interest), and the JPE scores, a 3-way ANOVA was used. The result showed that there was no a statistically significant 3-way interaction between gender, medical school year, and special interests on the empathy scores, $F(8, 1423) = 0.65$, $P = .72$.

Discussion

The purpose of this study was to measure the JSPE scores among Pakistani medical students. To achieve this purpose, we constructed 3 hypotheses based on previous research studies.

The results show that the JSPE scores in Pakistani medical students were lower than scores in Western countries.^{19,24,26,43} This could be attributed to the fact that

interpersonal skills, for example, humanities and communication skills are not integrated into the Pakistani undergraduate medical curriculum. This finding warns Pakistani educational policy makers to pay special attention to interpersonal skills such as communication skills and empathy to improve “the physical, mental, and social well-being of the clinician as well as the patient.”³

Hypothesis 1

Most of the studies on empathy³ show that women performed better than men. However, in this study, we found that women and men performed the same on the JSPE scores, which is consistent with some studies.^{27,30} Given that the JSPE scores in favour of female students in most studies, and our observational experiences in favour of women who show understanding of the care patient’s concerns, we did not expect to find a lack of gender disparity in the empathy results. As the sample size is large, it is less likely to argue about sampling bias. Also, the gender disparity may be due to “particular factors unique” to Western medical students,³⁰ which are unknown for non-Western countries. We recommend some ethnographic studies to explore the empathic culture in patient encounters in real-world settings.

Hypothesis 2

The findings show that as student’s progress through medical school, the JSPE scores decrease, although the magnitude of the difference between the different years of medical training is very small. A statistically significant association between groups (year 1 to year 5) could be due to the fact that the sample size was large to detect a difference, but the differences between groups were not zero. Given that the nature of this study, it is hard to draw clear conclusions about a decline of empathy over time in Pakistan, which have been reported in some Western studies.³⁶ Given that the previous research studies found a decline in students’ scores on the empty scale, we will recommend conducting longitudinal studies to understand the decline in empathy better during medical school training. These studies will enable to uncover the existence of interindividual variation within a student if the empathy does not remain constant over time.

Hypothesis 3

In the current study, there were no differences in mean empathy score of people with various future specialty preferences (people-oriented, technology-oriented, and undecided categories). This finding is not consistent with most of the previous research studies. Evidence strongly suggests that medical students who choose the people-oriented specialties score

better than those who are interested in technology-oriented specialties on the empathy scores.^{20,21,24,44,45} However, some studies are not in agreement with our results on the empathy scores.^{40,41} We expected that those who choose people-oriented specialties would outperform those who are interested in technology-oriented specialties. This should be further investigated as the empathy scores may not predict specialties ambitions, especially those who are interested in the people-oriented specialties. These specialties are procedural and may not demand a high degree of empathic behaviors compared with the people-oriented specialties.³

Limitations of this study should be acknowledged. We conducted a cross-sectional study with convenient sampling. Therefore, recruitment of voluntary participants may not be typical of the target population. In cross-sectional studies, it is possible to the results change over time. Therefore, a careful interpretation of the results is required as it is difficult to generalize to all medical students in Pakistan. Furthermore, in a self-reported assessment, social desirability response bias might produce socially desirable results. However, it has been argued that socially desirables responses are associated with the respondent's belief in the outcomes of the test.³ The JSPE was administered in "non-penalizing" situation, and students were assured about the confidentiality and anonymously and their responses would be used only for the research purpose approved by the ethic committees. This could minimize desirability response bias socially.

Conclusions and Implications of the Study for Medical Education

The findings of this study showed Western medical students countries outscored Pakistani medical students on the empathy scale. This finding has important implications for Pakistani medical educators to improve the interpersonal skills of medical students in the context of patient care. Inconsistent with our expectations and experiences, our findings do not support that female medical students scored better than their male counterparts on the empathy scale. In the light of a cross-sectional study, it is impossible to argue the decline of empathy during medical school training. Longitudinal studies are required to obtain an accurate figure of the empathy scores before and after clinical phases. A further finding does not show that the people-oriented specialties outperform the technology-oriented specialties. These findings raised an alarming red flag for medical educators to improve interpersonal skills within the undergraduate medical curriculum in Pakistan. Running interpersonal workshops to medical students may improve the empathy scores. We also recommended conducting sequential mixed methods to gain a greater insight of the status of empathy among medical students in Pakistan. Interpretive phenomenological studies are also encouraged to explore the

experiences and reflections of patients of their doctors' empathy and clinical outcomes.

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