

ORIGINAL ARTICLE

EMPATHY DEVELOPMENT IN UNDERGRADUATE MEDICAL STUDENTS: COMPARATIVE STUDY BETWEEN HEALTH EMPATHY MAPS AND NARRATIVE MEDICINE**Hina Akhtar Khan, Humaira Fayyaz Khan*, Sadia Zaheer**, Tayyiba Haq***, Shahroz Ansari[†], Shehribano Batool^{††}**Department of Health Professions Education, Bahria University College of Medicine Islamabad, *Department of Physiology, Islamic International Medical College, Rawalpindi, **Department of Medical Education, Sialkot Medical College, Sialkot, ***House Officer, Fauji Foundation Hospital, Department of[†]Medicine, ^{††}Surgery, Rawalpindi Medical University, Rawalpindi, Pakistan

Background: Empathy is a crucial skill in medical education, enhancing patient care and physician well-being. The aim of the study was to compare the effectiveness of Health empathy maps and Narrative medicine exercises to foster empathy in undergraduate medical students. **Methods:** This experimental study was carried out in a private medical college of Rawalpindi for a period of 6 months where 130 medical students were recruited and empathy scores were calculated by Jefferson scale of physician empathy student version. Participants were randomly allocated into two groups: Group 1 practiced the HEM after attending relevant workshops, whereas Group 2 wrote patient interaction-based narratives after attending the relevant workshops. CONSORT guidelines (2010) were maintained for research protocol. The post test scores were compared with pretest scores. Unpaired t test was used to compare the data between the two groups as the data was normally distributed (using Shapiro Wilk test). **Results:** The students demonstrated improved scores on Jefferson Scale of Physician Empathy (JSPE-S), assessing various facets of empathy. The Empathy Mapping group had high mean score 107.80 ± 12.72 as compared to Narrative Medicine group (101.51 ± 16.49). Both the groups had statistically significant difference as $p=0.016$. The resultant better technique proved to be the empathy maps. **Conclusion:** Our findings suggested that empathy maps prove to be an efficient way of fostering empathy in medical students. This strategy would benefit the patients in terms of treatment compliance and the doctors by reducing their stress and burnout.

Keywords: Empathy, Health empathy maps, Narrative medicinePak J Physiol 2025;21(1):87–91, DOI: <https://doi.org/10.69656/pjp.v21i1.1781>**INTRODUCTION**

Person centred medicine is emphasized as an innovative approach in health care.¹ According to the Institute of Medicine, person-centred care is ‘care that is respectful and responsive to individual patient preferences, needs and values, and ensuring that patient values guide all clinical decisions’.

Empathy is a milestone in person centred medicine. Clinical empathy can be defined as understanding patient’s circumstances, perspective and emotions, moreover interpreting their thoughts and feelings.² Nurturing empathy in healthcare professionals contributes significantly to improved patient outcomes that is why evaluating the effectiveness of teaching practices in diverse cultural contexts is essential, as the concept of professionalism varies across cultures.³

As regards health professionals the most influential understanding of empathy can be attributed to the work of Carl Rogers, a renowned psychotherapist known for his groundbreaking contributions to the therapeutic bond between clients and therapists. His client-centred approach, which aligned with the patient-centred approach, played a pivotal role in shaping our comprehension of empathy in the context of therapy.⁴

According to Morse *et al*, empathy has four fundamental constructs.⁵ Emotive empathy is experiencing and sharing in another’s psychological state and emotions. Moral empathy is the inner altruistic guide that serves as a motivation for practicing empathy, leading individuals to consider the welfare of others. Cognitive empathy is to objectively identify and understand another individual’s emotions and perspective without necessarily sharing the same emotional experience. Behavioural empathy is delivering the insight of another’s perspective through improved communication.

Empathy is a multidimensional construct which has to be developed and assessed in different ways.⁶ That is the reason behind the constant improvement of empathy assessment indices currently in use.⁷ Development of an empathic physician requires nurturing attitude, competency and behaviour. The competencies to be achieved are empathetic skills which could include being a good listener, communication skills and skills to build a trustful relationship.⁸

According to researchers’ empathy can be considered as a multidimensional construct.⁹ The four key areas, emotive, moral, cognitive and behavioural,

can be analysed through concept analysis of health empathy maps filled by the students after patient encounters. The basic rationale to conduct the experiment is to compare teaching strategies devised to inculcate empathy in undergraduate medical students and to analyse their effectiveness in Asian cultural context. Enhancing the empathetic skills and teaching strategies can have positive role on patient safety. Exhibiting empathy can be different in eastern and western diaspora. Lack of resources and strenuous workload are considered the key inhibiting factors in displaying empathy and compassion.¹⁰

Empathy maps are addressing the constructs of empathy triad thus it can prove to be a cost effective and a structured way of interviewing patients in a busy hospital setting.

METHODOLOGY

The study was conducted after the approval from the Ethical review committee, Foundation University Medical College, letter No. FF/FUMC/215-280-1 Phy/23. A randomized control trial was conducted for 6 months from Feb to Jul 2023 after approval of synopsis, using a parallel study design.

Sample size was calculated as 128 using the G Power Sample size calculator. 3rd year MBBS students were enrolled in the current academic session. The students were selected to attend the workshops designed after the literature review, and provided written informed consent.

Simple randomized sampling was done to tackle the confounders affecting the results. It eliminates the bias as every student has an equal chance of participation in either intervention.¹¹ Randomization was achieved through a lottery method to ensure equal probability of assignment to either intervention group. After confirming participants' eligibility based on the inclusion criteria and giving an informed consent, each participant was assigned a code. These codes were then placed into a container, and a neutral third party drew the codes randomly to assign participants to either Group 1 (HEM) or Group 2 (Narrative Medicine). This process ensured that neither the participants nor the researcher had prior knowledge of group allocation, maintaining blinding and minimizing selection bias.

There were two groups with 65 participants in each group. An intervention was introduced in both groups. Autonomy was maintained by allowing the students to have full right to refuse from participating or if at any time they want to withdraw from the study they are allowed to do so. The confidentiality was maintained throughout the data collection process as it was collected through Google forms and correspondence was through emails.

A pilot test involving 10 students was conducted to assess the feasibility, appropriateness, and

accuracy of the validated tool Jefferson's Scale of Physician Empathy (Student version) (JSPE-S). Feedback from the students revealed challenges in understanding two questions in the sociodemographic questionnaire, prompting the need to rephrase those questions for improved comprehension. Additionally, the students were requested to engage in the interventions and reported that the instruments were user-friendly and practical. This pre-testing helped in the overall enhancement of the clarity and reproducibility of the methodology.¹²

The workshops were designed based on a thorough literature review highlighting the importance of communication skills and understanding nonverbal cues for empathy development. Both interventions incorporated experiential learning, a proven method to foster empathy in healthcare professionals.¹³ A true experimental design was employed to compare the efficacy of two approaches—Health Empathy Map (HEM) training and narrative medicine exercises—in enhancing empathy among 3rd year MBBS students.¹⁴ There were reasons identified in various researches and this year was chosen due to previous literature highlighting a decline in empathy among medical students during the transition to the clinical cycle.¹⁵

The study included two phases. In Phase 1, all participants completed a baseline questionnaire that included socio-demographic items and the Jefferson Empathy Scale (student version). In Phase 2, participants were randomly divided into two groups, with both groups attending workshops focused on communication skills and the recognition of verbal and nonverbal cues. The only difference between the interventions was the specific training provided:

Group 1 (G1): Students were introduced to the Health Empathy Map (HEM), a tool designed to develop empathy by exploring patients' emotions, needs, and perspectives. They practiced completing the HEM during patient interactions.

Group 2 (G2): Students were trained in narrative medicine, which involved writing reflective narratives based on their patient interactions without using a structured tool like the HEM.

At the end of the three-week discipline, all participants completed the Jefferson Empathy Scale (student version) again to measure any changes in empathy levels. CONSORT guidelines were followed to ensure methodological rigor, and all collected data—questionnaires, maps, and narratives—were anonymised using participant registration numbers.

The Health Empathy Map (HEM) consists of four quadrants corresponding to the core components of empathy: perspective-taking, emotional sharing, and empathetic concern.¹⁶ Each quadrant was associated with specific prompts:

1. 'What would you feel if you were in this person's shoes?'
2. 'What is your perception of this person's needs and desires, both current and future?'
3. 'How do I feel knowing this person's history?'
4. 'How can I help this person?'

At the centre of the map, students placed an emoji reflecting the patient's emotions based on their interpretation.

Narrative medicine emphasizes storytelling as a means to enhance healthcare professionals' understanding of illness. In this study, students were guided to write narratives reflecting on their patient interactions. Unlike the HEM, narrative medicine exercises were unstructured and relied on students' individual reflections without predefined prompts.

This design allowed a direct comparison between the structured approach of the HEM and the open-ended reflective process of narrative medicine, while maintaining consistency in the foundational content of the workshops.

At the start of the study, we filled out the socio-demographic questionnaires to take into account the confounding variables. After the first intervention there was a cross-over design and the participants were subsequently subjected to the second intervention.¹⁷

Social desirability bias, defined as the tendency to provide answers that portray one self positively, was minimized by ensuring complete confidentiality for participants, including students and patients. Responses were anonymised through coded data collection and handled discreetly to reduce the likelihood of altered answers influenced by social expectations.¹⁸

There is risk of contamination after the workshops because the students might discuss their interventions. The participants were blinded to the specific teaching strategy being used by designing the workshops in a way that were similar in all aspects including the training on communication skills and interviewing skills. The strategies were implemented in separate clinical wards. The data was also analyzed for signs of contamination bias.

RESULTS

Collected data was processed through SPSS-26, using standard protocol analysis. Normality of data was checked by Shapiro-Wilk test. The data was found to be normally distributed. Baseline variables were analysed descriptively using frequencies and percentages for qualitative variables like gender, chronic illness, medico-legal encounter and mean with standard deviation for continuous variables like age and Pre and Post Jefferson Scale of Physician Empathy (JSPE-S) scores. Statistically significant differences in JSPE-S scores before and after intervention were

assessed in both the groups using Paired sample *t*-test for HEM group and narrative medicine group. The independent *t*-test was used for the comparison of empathy mapping and narrative medicine groups, and $p \leq 0.05$ was considered significant.

A total of one hundred and fifty-eight (158) medical students were included, twenty-eight (28) did not complete the follow up then excluded from the analysis, so data of 130 medical students were included in the final analysis. Out of 130 students, 35 (26.9%) students were male and 95 (73.1%) were females. Mean age of the students was 21.16 ± 0.97 years range from 19 to 25 years. Of the total, 15 (11.5%) had chronic illness and 115 (88.5%) did not suffer from any chronic ailment. However, 44 (33.8%) students had family history of chronic illness and 86 (66.2%) students did not have family history of chronic illness. Eleven (8.5%) students had medico-legal encounter and 119 (91.5%) did not have medico-legal encounter.

The Jefferson scale of empathy was used to compare the effectiveness on the changes in the empathy of the undergraduate medical students. The JSPE-S consists of 20 items on a 7-point Likert scale (1=Strongly disagree, 2=Slightly disagree, 3=Disagree, 4=Neutral, 5=Agree, 6=Slightly agree, 7=Strongly agree). The Cronbach Alpha of our study was 0.852 which shows that it is a validated tool for our study population.

After the pre-test (before the intervention) the students were divided into two groups. The first group was subjected to empathy mapping workshop and the second group to narrative medicine workshop. Both groups had improvement after intervention. (Table-1).

The mean overall empathy level across all the data points was 60.53 ± 10.69 range from 33.00 to 86.00 for pre-test (before intervention) and 104.65 ± 15.01 range from 63.00 to 132.00 for post-test. There were statistically significant differences between pre and post intervention (overall) ($p < 0.001$).

Group 1 (empathy mapping) and Group 2 (narrative medicine) showed significant differences among pre and post intervention ($p < 0.001$). Table-2 shows a comparison of the mean scores of narrative medicines as compared to empathy mapping.

Empathy is a multidimensional construct and Jefferson scale of empathy questionnaire corresponds to three parts, Perspective Taking, Compassionate care and Standing in the Patient's shoes. The first part Perspective taking corresponds with these 10 questions (2, 4, 9, 20, 13, 16, 10, 5, 17, 15), the second part Compassionate care encloses 8 questions (11, 7, 12, 19, 1, 8, 14, 18) and the third part Standing in the Patient's shoes holds only two question (3, 6). All the parts were improved after the intervention with high significant $p < 0.001$. (Figure-1).

Table-1: Individual item responses on the JSPE-S for both pre and post intervention

No.	Question	Empathy Mapping		Narrative Medicine	
		Pre-Test	Post-Test	Pre-Test	Post-Test
1.	Healthcare providers' understanding of their patients' feelings and the feelings of their patients' families does not influence treatment outcomes	2.94±1.82	5.51±1.42	2.80±1.76	5.14±1.90
2.	Patients feel better when their healthcare providers understand their feelings	3.02±2.04	3.71±1.99	3.38±2.21	5.32±1.82
3.	It is difficult for a healthcare provider to view things from patients' perspectives	2.77±1.54	3.45±1.46	3.42±1.37	4.28±1.70
4.	Understanding body language is as important as verbal communication in healthcare provider-patient relationships	3.85±2.79	5.85±1.41	3.11±2.21	6.08±1.16
5.	A healthcare provider's sense of humour contributes to a better clinical outcome	2.60±1.51	4.80±13.8	3.12±1.99	5.28±1.12
6.	Because people are different, it is difficult to see things from patients' perspectives	3.45±1.83	4.34±1.34	3.62±1.63	4.63±1.25
7.	Attention to patients' emotions is not important in-patient interview	2.48±1.65	5.58±1.28	2.34±1.20	5.54±1.51
8.	Attentiveness of patients' personal experiences does not influence treatment outcomes	3.12±1.58	5.03±1.34	3.14±1.28	5.11±1.33
9.	Health care providers should try to stand in their patients' shoes when providing care to them	2.60±1.28	5.34±1.52	2.71±1.28	5.49±1.34
10.	Patients value a healthcare provider's understanding of their feelings which is therapeutic in its own right	2.68±1.87	5.37±1.51	2.37±1.02	5.54±1.34
11.	Patients' illnesses can be cured only by targeted treatment; therefore, healthcare providers' emotional ties with their patients do not have a significant influence in treatment outcomes	3.29±1.62	5.06±1.51	3.12±1.25	5.08±1.44
12.	Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints	2.86±1.44	5.02±1.35	2.78±1.15	5.18±1.58
13.	Healthcare providers should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language	2.62±1.62	5.48±1.38	4.75±1.93	5.68±1.18
14.	I believe that emotion has no place in the treatment of medical illness	2.45±1.39	5.68±1.22	2.60±1.27	5.65±1.32
15.	Empathy is a therapeutic skill without which a healthcare providers' success is limited	2.26±1.30	5.32±1.82	2.37±1.26	5.82±1.19
16.	Healthcare providers' understanding of the emotional status of their patients, as well as that of their families is one important component of the healthcare provider – patient relationship	5.46±1.23	5.37±1.38	5.62±0.94	5.86±1.15
17.	Healthcare providers should try to think like their patients in order to render better care	2.95±1.28	5.03±1.59	3.35±1.35	5.35±1.41
18.	Healthcare providers should not allow themselves to be influenced by strong personal bonds between patients and their family members	2.97±1.47	4.74±1.48	3.05±1.42	5.28±1.38
19.	I do not enjoy reading non-medical literature or the arts	2.86±1.71	5.23±1.56	2.23±1.37	5.60±1.48
20.	I believe that empathy is an important factor in patients' treatment	2.26±1.31	5.62±1.51	1.89±1.06	5.91±1.23

Table-2: Comparison of pre and post-test with respect to empathy mapping and narrative medicine

Study Parameters	Pre-Test	Post-test	p
Empathy Mapping	61.76±10.82	107.80±12.72	<0.001**
Narrative Medicine	59.29±10.50	101.51±16.49	<0.001**

Paired t-test, **highly significant

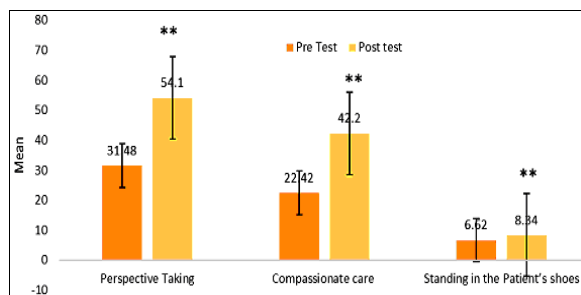


Figure-1: Comparison of pre and post mean response for constructs of empathy

DISCUSSION

The main aim of the study was to compare the effectiveness of empathy maps and narrative medicine to develop empathy in undergraduate medical students. This experimental design considered the challenges faced by the physicians working in a condition of high workload, stressful conditions and underdeveloped health care settings.¹⁹ The study provides evidence that providing framework to medical humanities would help in shaping the future physicians and nurture empathy in them.

Empathy maps have been used in business models to develop the personas of clients and to better understand the needs and desires of the users.²⁰ In another study empathy maps have been used to identify the professional needs in an organization in nursing profession.²¹ There has been a slight modification to develop health empathy maps and have proven to be effective to inculcate empathy in medical residents. This study yielded significant results but there was a lack of comparative group. In a recent study empathy map have proved to enhance communication skills in medical students.²² Hence, there was a gap for studies with larger sample size and a comparative group to fully understand the potential role of health empathy maps.

This is the first study with a comparative group of narrative exercises and the sample was also sufficient with 130, 3rd year MBBS students. Sixty-five students attended the HEM group and the other 65 attended the narrative medicine group. Both the groups had a pre-test before the intervention and after four weeks of intervention they had had a post-test. The results of this study are promising with significant increase after four weeks of intervention in both the groups. The results proved that the scores of the students in the HEM group improved remarkably. Health empathy maps proved to be more effective and more cost-effective, time efficient, more structured and focused activity that can be carried out in busy hospital settings as compared to narrative medicine exercises.

Stress and burnout are two other factors that decrease physicians' empathy as they go up the ladder. There is a fine line that has to be attained where a doctor sets up boundaries for their objectivity. These areas need to be nurtured along at the clerkship levels and practiced along the undergraduate and postgraduate journey to master these soft skills. Non empathic doctors were proven to be linked to stress and excessive workload.²³ The need to practice skills for developing empathy can prove to reduce stress and manage anxiety in the undergraduate medical students.

Similar studies have been conducted where empathy development curricula have shown promising results in medical residents.²⁴ Such trials have demonstrated that right teaching strategies will prove beneficial in inculcating empathic behaviours in medical students towards their patients. Empathy mapping thus proves to be an effective way of reciprocating the humanistic approach of literary activities such as narrative writings.

CONCLUSION

Health empathy maps provide a structured way for undergraduate and postgraduate medical students to enhance their doctor-patient relationship by fostering empathy for their patient. These empathy maps could win a permanent place in portfolios and thus provide a way to reflect back on the professional growth of a student during a semester or throughout the year. Practicing health empathy maps allows the healthcare workers not only to improve their empathy levels but also enhances their communication skill, team building, decision making and leadership qualities.

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Address for Correspondence:

Dr Hina Akhtar Khan, Department of Health Professions Education, Bahria University College of Medicine, Islamabad, Pakistan. Cell: +92-321-5068856

Email: tshahid82@gmail.com

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Contribution of Authors:

HAK: Write-up, Data Collection
TH: Sample Collection

HFK: Sample Collection
SA: Data Analysis

SZ: Write up
SB: Data Analysis

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