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Empathy Levels in Medical Students: Do They Really Change Over Time?

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Abstract

There is conceptual ambiguity in defining empathy, which is further amplified when trying to define clinical empathy. The construct of empathy has been an ongoing debate: sometimes being interpreted as a cognitive attribute, other times as an emotional state of mind. Our preferred definition is moral, emotive, cognitive and behavioural dimensions working in harmony to benefit the patient. Understanding the feelings, attitudes and experiences of a patient is the first step towards a potent and effective interview and, thereby, therapeutic agreement. Thus, clinical empathy may be the most powerful tool for a successful collaboration between the patient and the doctor. This chapter discusses the history of clinical empathy starting with Sir William Osler's definition of 'neutral empathy' where he argues that physicians need to neutralise their emotions so that they can 'see into' and, thereby, be able to 'study' the patient's 'inner life', to Halpern's insightful observations about the power of empathy, which 'lies in its ability to help us cross the divide between clinicians and patients created by their very different circumstances'. This is followed by a summary of the literature deliberating the increasing concern among medical educators and medical professionals regarding the decline in medical students' empathy during medical school, which brings us to our research question: are there significant changes in empathy levels over time in undergraduate medical education? This body of work reports on a cross-sectional study of all medical students enrolled at an Australian medical school, known for its cultural, social and religious diversity, in 2011. The research instrument used consisted of a survey encompassing questions on demographics in addition to the Jefferson Scale of Physician Empathy, Student version (JSPE-S). Empathy levels were compared while controlling for effects of age, gender, marital status, religious belief, ethnicity/cultural background, year of medical training, previous education and level of completion of programmes promoting altruism in an attempt to identify their effect on the levels of empathy. A total of 404 students participated in the study. The scores of the JSPE-S ranged from 34 to 135 with a mean score of 109.07 ± 14.937 . This is considered moderate to high when compared to reported scores in previous studies on medical students. Female medical students had significantly higher empathy scores compared to their male counterparts in total and

in individual years. Contrary to the literature, there were no significant differences in empathy scores in relation to the stage of medical training. Findings suggest that there is a gender difference in the levels of empathy, favouring female medical students, and that empathy levels may be preserved in medical school despite prior evidence that a decline is pervasive.

Keywords: empathy, medical students, undergraduate, medical training, medical education

1. Introduction

In medicine, emotional responses to patients are seen as threats to objectivity and doctors strive for detachment to be able to care, reliably, for all patients regardless of their personal feelings. Blumgart [1] recalls Sir William Osler's 'Aequanimitas' in his definition of 'neutral empathy' which states that a physician will do what needs to be done without feeling grief, regret or other difficult emotions. Sir William Osler argues that by neutralising their emotions to the point that they feel nothing in response to patient suffering, physicians can 'see into' and, thereby, be able to 'study' the patient's 'inner life' [2].

Empathy is sometimes confused with 'sympathy'. Sympathy is defined as *experiencing* another's emotions, whereas empathy is *appreciating or imagining* those emotions. Some authors indicate that doctors who sympathise with their patients share their suffering which could lead to emotional fatigue and lack of objectivity [3]. Others imply that the emotional component of empathy is nothing other than sympathy in context [4]. Yet, patients want genuine empathy and most doctors want to provide it.

In order to deal with this conceived conflict between emotions and objectivity, 'professional empathy' was defined on a purely 'cognitive' basis. It was defined as 'the act of correctly acknowledging the emotional state of another without experiencing that state oneself' [5]. This model of 'detached concern' assumes that knowing how the patient feels is no different from knowing that the patient is in a certain emotional state. However, the function of empathy is to recognise what it feels like to experience something, not merely to label emotional states [3].

In the clinical context, Stepien and Baernstein [6] combined the different definitions within the literature to put forward an expanded definition of empathy. This proposed definition includes moral, emotive, cognitive and behavioural dimensions. All four dimensions should work in harmony to benefit the patient. These dimensions were described as follows:

1. Moral: the physician's internal motivation to empathise
2. Emotive: the ability to imagine the patient's emotions and perspectives
3. Cognitive: the intellectual ability to identify and understand patients' emotions and perspectives
4. Behavioural: the ability to convey understanding of those emotions and perspectives back to the patient

1.1. The power of empathy

Empathy skills may be the clinician's most powerful tool. A successful medical interview involves successful collaboration between the patient and the doctor. Thus, understanding the feelings, attitudes and experiences of the patient is a very important step towards a potent and effective interview and, thereby, therapeutic agreement and compliance. Empathy can, therefore, positively affect communication and lead to improved therapeutic outcomes. There is growing evidence that emotionally engaged physicians communicate more effectively with patients, thereby, decreasing patient anxiety and improving patient coping leading to greater therapeutic efficacy and an overall better outcome [7, 8]. On the other hand, lack of empathy increases patient dissatisfaction and the risk of malpractice suits [9].

Halpern [10] sheds light on the importance of empathy in difficult circumstances. She gives two examples of situations going horribly wrong due to lack of empathy and hence lack of communication between the doctor and the patient or the patient's family. In managing difficult patients and in situations where there is a patient-physician conflict, it is recommended taking a conflict resolution approach. To do so, physicians have to first empathise with patients and family members [11–14]. As stated by Egner [15], empathy helps us bridge the divide between clinicians and patients:

'The power of empathy lies in its ability to help us cross, if only for a moment, the divide between clinicians and patients created by their very different circumstances' (*page 10*).

By imagining what the patient is experiencing, and by communicating this insight, empathy can also help us put aside our negative judgement or disagreement with patients and enhances the effectiveness of care and patient satisfaction [15]. However, many patients may not have the skill or ability to reveal their feelings to their providers (**Table 1**). Patients need to be made aware that feelings are a legitimate topic for discussion in a medical interview. They also need to realise that their doctor values their feelings and is interested in the emotions they are experiencing [15].

Halpern [3] illustrates four ways by which physicians can capitalise on their emotional responses to enhance medical care:

1. Empathy involves associative reasoning; empathic listening helps physicians appreciate the personal meanings of patients' words resulting in logical thinking and better diagnoses. 'Patients' words communicate meanings that cannot be summarised on a preformed checklist'.
2. Emotions help in grasping the attention on what is humanly significant. 'Emotional attunement' spontaneously guides and directs the attention to some aspects of the patients' histories over others.
3. Empathy facilitates trust and disclosure, and can be directly therapeutic. Empathy and engaged communication have been linked to decreased patient anxiety and improved outcomes [8, 16].

4. Empathy makes being a physician more meaningful and satisfying. Physicians who respond to their emotions enrich their own experience of doctoring. A study shows that physicians with a communication style that is engaging and psychologically oriented burn out less frequently than others [17].

Doctor	Patient
<ul style="list-style-type: none"> • Time consuming • Too draining • Will lose control of the interview • Unable to fix patient's distress • Not my job • Perceived conflict of interest 	<ul style="list-style-type: none"> • Cultural taboo • Preference to interpret distress in a biomedical model • Somatisation disorder • Desire to meet doctor's expectations • Worry about being emotionally overwhelmed • Lack of language for emotions

From: Egener [15].

Table 1. Barriers to discussing emotions.

Despite all this, many physicians still do not see patient's emotional needs as a core aspect of illness and care. The concept that the physician does not need to understand the affective dimension of the patient, and hence does not need to have empathy, stems from the 'over-arching norm of detachment' within medicine [18]. The 'sceptic' may even ask if physicians can 'just behave empathically' without the emotional response. Halpern answers this question by emphasising that patients sense whether physicians are 'emotionally attuned' and that patients trust 'emotionally attuned' physicians and adhere better to their treatment. She also highlights that 'empathic attunement' guides physicians about when to ask questions and when to stay silent, which leads to better communication and results in patient's disclosing important information [3].

1.2. The role of medical education

Empathy is an indispensable skill in medicine and is an integral part of 'professionalism'. It is fundamental for medical schools to educate students on the importance of empathy. The Australian Medical Council (AMC) emphasises that medical course outcomes should be consistent with the AMC's goals for medical education and that it should incorporate knowledge, skills and professional attitudes. The AMC highlights that professional attitudes are at least as important as knowledge and skills:

'The combination of knowledge, skills and attitudes that is considered an essential foundation for further prevocational and vocational training for medical doctors is very complex. These attributes cannot be defined simply as lists of factual knowledge, practical skills or competencies, as many are related to abstract qualities. Knowledge and practical skills are important, but understanding, problem-solving ability and appropriate attitudes relevant to caring for individuals who are suffering are at least of equal importance' [19].

Despite rigorous research, there is still increasing concern among medical educators and medical professionals regarding the decline in medical students' empathy during medical education [20–24]. Some studies suggest that the decline is mostly pronounced in the later years while others suggest that it occurs in the early years of medical education [25, 26]. Varying designs, employing varying instruments, have been used. Cross-sectional and longitudinal studies were applied. Instruments utilised included the Student Version of the Jefferson Scale of Physician Empathy (JSPE-S) [26], Hogan's Empathy Scale (HES) [27], the Balanced Emotional Empathy Scale (BEES) [23] and the Interpersonal Reactivity Index (IRI) developed by Davis [28]. The general consensus was that empathy declines during medical education. Only recently have studies started questioning whether such a decline is of significant magnitude or 'greatly exaggerated' [29].

While many studies have shown decreasing empathic behaviour of medical students, few have considered the impact of the curriculum and very few have offered solutions, particularly feasible solutions [30–34].

In response, we were determined to further explore this alleged phenomenon by inspecting empathy levels across the entirety of students enrolled at an undergraduate medical school. We controlled for effects of age, gender, marital status, religious belief, cultural background, cohort, previous education and specific personal and professional development programmes (PDP), in an attempt to identify their effect on the levels of empathy.

2. Aim of study

The aim of this study was to compare levels of empathy in undergraduate medical students across the different years of the medical programme at University of Western Sydney (UWS), taking into consideration that all medical students experienced the same rigorous professionalism-centred selection process and, thereby, should have comparable behavioural attributes. Also, to examine differences in empathy in relation to gender, year of study, cultural and religious backgrounds, previous education and certain programmes within the curriculum, the following questions were addressed:

- Are there significant changes over time in undergraduate medical education?
- Does the exposure to clinical practice affect the level of empathy in undergraduate medical students?
- Is there a difference between the levels of empathy in male and female medical students?
- Do cultural and religious backgrounds influence levels of empathy in medical students?
- Does previous education impact levels of empathy in medical students?
- Is there a difference between the levels of empathy in students who have completed Ethics and community-based programmes and those who have not?

3. Methods

The study described is a cross-sectional study involving medical students enrolled at an undergraduate, 5-year Australian medical programme. The study was approved by the University's Human Research Ethics Committee (HREC) and the Local Health District (LHD) HREC.

Participation in the study was voluntary and anonymous. All students enrolled in the first through the fifth year medical school, during the academic year of 2011, were eligible to participate in the study. The curriculum at the UWS School of Medicine consists of a 5-year undergraduate programme entailing 2 years of pre-clinical study, with limited patient contact, followed by 3 years of clinical rotations. The instrument used was distributed to medical students in paper format. Students were asked to return the completed surveys to the principle investigator.

The research instrument consisted of a survey encompassing an empathy scale in conjunction with questions on demographics, stage of medical education, previous degree(s) and level of completion of particular programmes within the curriculum that aim at promoting altruism (namely Community Medicine and Ethics). The empathy scale employed was the Jefferson Scale of Physician Empathy, Student version. The JSPE-S is a 20-item psychometrically validated instrument where respondents are required to indicate their level of agreement to each item on a seven-point Likert Scale (i.e. 1 = strongly disagree, 7 = strongly agree). The JSPE-S total score ranges from 20 to 140 with higher values indicating a higher degree of empathy.

Students who failed to return the survey were considered as non-responders. Also, surveys with more than two missing responses to the items of the scale were discarded. For those with one or two missing responses, the mean score to their existing responses was used to replace the missing ones.

A few tools exist for measuring empathy and some of them have been used in medical education research. One example is the Interpersonal Reactivity Index developed by Davis [28]. It is based on four components representing the cognitive and emotional domains of empathy. These components are perspective taking, empathic concern, fantasy and personal distress. Another research tool is the Empathy Scale developed by Hogan [35] and adopted from the California Psychological Inventory (CPI), the Minnesota Multiphasic Personality Inventory (MMPI) and test forms used at the Institute of Personality Assessment and Research (IPAR). Other empathy measuring tools, such as the Empathy Construct Rating Scale [36], the empathy subtest of the Relationship Inventory [37] and the Empathy Test, [38] also exist but were mostly used in nursing research.

The JSPE-S was chosen because it was designed specifically to investigate the development of physician empathy, as well as its variation and its correlates in different stages of medical education and among different groups of medical students and physicians [39]. It has been tested for validity (face, content, predictive, concurrent and construct) and reliability and has been modified to improve clarity. Another advantage to the JSPE-S is the balance between positively and negatively worded items (10 each). The use of positively and negatively worded items is a method usually used in psychology tests to decrease the confounding 'acquiescent response style', for example, a tendency to constantly agree or disagree with statements [39, 40].

Socio-demographic characteristics included age, gender, marital status, religion, cultural background and year of education. Missing values were common in this section, especially in relation to age, religion and culture and could not be recorded. We predicted missing values for religion and culture for which we made it explicit that this section was completely voluntary, yet it was surprising to have numerous missing values in relation to age. Reasons may be being the first item in the survey, following a paragraph of instructions and the location of the item on the page.

As a result of the unavailability of complete data, the number of observations varied for the different variables (**Table 2**).

3.1. Statistical analyses

All computations were carried out using the IBM SPSS Statistical Software. Non-parametric tests were used in all analyses due to the absence of normality in the distribution of empathy levels amongst medical students participating in the study. Tests included the Kruskal-Wallis and Mann-Whitney tests.

Age	Gender	Marital	Ethnicity	Cohort	CM*	Ethics	Prior degree	Religion	
Valid	193	407	406	277	407	215	106	34	323
Missing	214	0	1	130	0	192	301	373	84

*Community Medicine

Table 2. Valid and missing numbers in demographics and characteristics of UWS medical school students.

4. Results

The overall response rate comprised 69.78% of the total number of students ($n = 579$) at the UWS School of Medicine, at the time the research was undertaken. The response rates for years 1–5 were 74.38, 73.19, 82.3, 30.77 and 86.0%, respectively. The response rate for year 4 students was comparatively lower because the mode of delivery of the test was different to the other cohorts. In years 1–3 and 5, students had been allocated a session to complete and return the surveys, whereas one could not be allocated for fourth year students. Naturally, the response rate was considerably smaller. This may indicate that the results of this group may not be an accurate representation of their entire cohort.

4.1. Socio-demographic characteristics

4.1.1. Age, gender and marital status

A total number of 407 students participated in this study (**Table 3**). Three students had left out more than two items and, hence, their surveys were discarded. Of the remaining 404 respondents, there were 229 (56.7%) women and 175 (43.3%) men. The age of the students ranged from 17 to 44 years with a mean of 20.87 ± 3.08 years. Student distribution included

Age	Range: 17–44 years Mean ± SD: 20.87 ± 3.08 years
Gender	Females: 229 (56.7%) Males: 175 (43.3%)
Year of study	Year 1: 90 (22.1%) Year 2: 101 (25.1%) Year 3: 107 (26.8%) Year 4: 32 (7.9%) Year 5: 74 (18.2%)
Marital status	Unmarried: 365 (90.3%) Has partner: 22 (5.4%) Married: 9 (2.2%) Married parent: 5 (1.2%) Single parent: 2 (0.5%)
Ethnicity and culture	South-East Asian: 83 (20.5%) Indian: 79 (19.6%) Northern European: 55 (13.6%) Sub-continental European: 31 (7.7%) Middle-Eastern: 18 (4.5%) Indigenous Australian: 5 (1.2%) Mixed: 4 (1.0%) African: 1 (0.2%)
Religious belief	Christian/Muslim/Jewish: 167 (41.3%) Atheist/Agnostic: 85 (21.0%) Hindu/Buddhist: 69 (17.1%)

Table 3. Demographics of student population showing mean and range of age, and distribution of gender, year of medical training, marital status, ethnicity and religious belief.

90 (22.1%), 101 (25.1%), 107 (26.8%), 32 (7.9%) and 74 (18.2%) students for first, second, third, fourth and fifth years, respectively. Most of the students (90.3%) were unmarried, 22 (5.4%) had a partner, while 9 students were married and 7 had children.

4.1.2. Ethnicity/culture and religion

The nature of the student population at the UWS is fairly diverse. This diversity was reflected in the distribution of ethnicity of participating students. Students with a South-East Asian and Sub-continental Asian (Indian) backgrounds had the highest frequencies and constituted almost half of the population (20.% and 19.6%, respectively); this was followed by students from a European background (13.6%). The diversity of religious belief was also a prominent feature of this student population. For simplicity, this entity was split into three groups [41]. The highest percentage was that of the 'Abrahamic religions' (41.3%) followed by the Atheist/Agnostic (21%), then Hinduism/Buddhism (17.1%) (**Table 3**).

4.1.3. Past education and completion of Community Medicine and Ethics programmes

Of the total population, only 32 students had completed a tertiary degree prior to starting their medical degree. Twenty-one students had completed a science degree while 11

had completed a degree other than science (Arts, Business, Commerce, Education, Law and Design).

Not all responded to items related to Community Medicine and Ethics. Numbers of response rates were 213 and 106, respectively. One hundred and thirty-nine (34.4%) had completed Community Medicine, while ninety-three (23%) had completed Ethics.

4.2. Descriptive characteristics of the scale

Reliability testing showed a Cronbach's Alpha of .88 for the JSPE-S, indicating internal consistency of the scale items. The minimum, maximum, mean, standard deviation, skewness and kurtosis of the JSPE are reported in **Table 4**. The scores for the entire sample ranged from 34 to 135 with a mean score of 109.07 ± 14.937 .

The skewness and kurtosis were -1.964 and 5.926 , respectively. The score distribution for the entire sample showed non-parametric distribution with a skewness towards the upper end of the scale (**Figure 1**).

4.3. Group comparisons of the Jefferson Scale of Physician Empathy Scores

There were no significant differences in the empathy scores when comparing the student populations with regard to age, marital status, ethnicity/culture, religious belief, year of study and prior education/degree. Also, there were no associations recorded between the empathy scores and level of completion of Community Medicine and Ethics courses (**Table 5**).

When investigating at the differences by gender, female medical students were found to have significantly higher empathy scores than male medical students in total (111 vs. 106, $p < 0.001$) and in all 5 years of medical training (**Figure 2**). Female students not only scored higher in the total JSPE-S score but also scored in 11 out of the 20 individual items of the scale ($p < 0.05$) (**Table 6**).

Items in which female students scored significantly higher were as follows:

- 'I do not enjoy reading non-medical literature or the art' (reverse scoring)
- 'I believe that emotion has no place in the treatment of medical illness' (reverse scoring)

	<i>N</i>	Minimum	Maximum	Mean	Std. deviation	Skewness	Kurtosis		
							Std. error	Std. error	
JSPE score	404	34	135	109.07	14.937	-1.964	0.121	5.926	0.242

Table 4. Descriptive statistics of Jefferson Scale of Physician Empathy scores, Student version (JSPE-S).

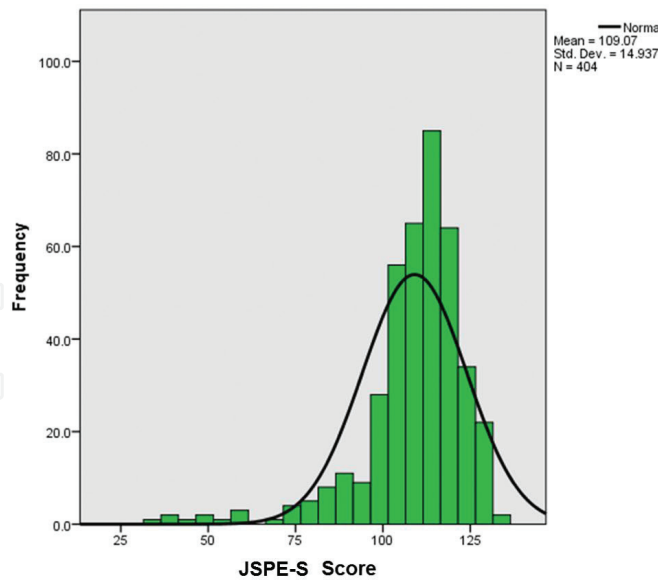


Figure 1. Histogram showing a non-parametric distribution of the Jefferson Scale of Physician Empathy scores among the student population.

	Age	Marital status	Culture/Ethnicity	Religion	Year	Previous degree	CM*	Ethics
Chi-Square	57.381	75.368	62.615	50.751	76.371	1.7153	56.229	34.816
Asymp. Sig.	.387	0.157	0.253	0.739	0.138	0.424	0.391	0.741

Kruskal-Wallis test.
 Grouping variable: JSPE-S score.
 Significance at $p < 0.05$.
 *Community Medicine

Table 5. Empathy scores in relation to age, marital status, ethnicity, religion, year, prior degree and level of completion of Ethics and Community Medicine.

- ‘Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members’ (reverse scoring)
- ‘I believe that empathy is an important therapeutic factor in medical treatment’
- ‘Empathy is therapeutic skill without which the physician’s success is limited’

There were no associations noted between the levels of empathy and marital status, previous tertiary education, ethnicity/cultural background or religious belief.

Although insignificant, it was interesting to find that single parents (2 students), students with a prior tertiary degree other than science (11 students), Indigenous Australians (5 students) and Atheists/Agnostics scored the highest means in the JSPE-S. Females outscored their male counterparts in all variables except for culture where male indigenous students scored higher means than female indigenous students (130 vs. 120).

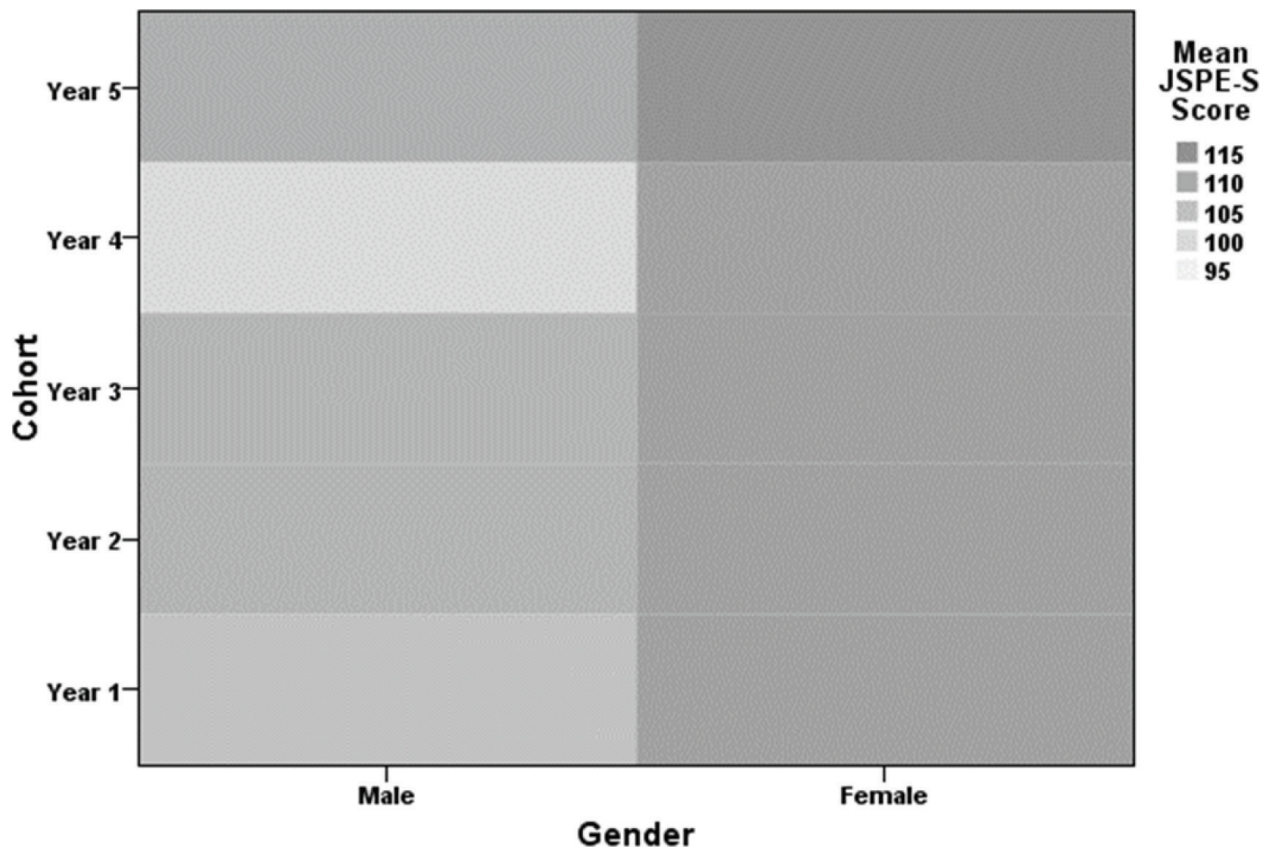


Figure 2. Heat map showing the differences between means of the Jefferson Scale of Physician Empathy in relation to gender and year of undergraduate medical training.

4.3.1. Year, Community Medicine and Ethics

Surprisingly, there were no significant differences in the total empathy scores in relation to the year of medical training, nor were there significant differences between students who had completed Community Medicine and Ethics, and those who had not. Although there were no significant differences recorded, it is worthwhile mentioning that the highest means were scored by year 5 students and those who had completed Community Medicine and Ethics (see **Figure 3**).

When investigating at the different items of the scale in relation to the year of medical training, only four items showed a significant difference across cohorts. In order of significance, these were the following items:

- ‘Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members’ ($p = 0.005$) (reverse scoring)
- ‘Because people are different, it is difficult to see things from patients’ perspectives’ ($p = 0.027$) (reverse scoring)
- ‘Physicians should try to think like their patients in order to render better care’ ($p = 0.03$)
- ‘Attention to patients’ emotions is not important in history taking’ ($p = 0.039$) (reverse scoring)

Item	Mean JSPE score in medical students		Asymp. Sig. (two-tailed)
	Male students	Female students	
Physicians' understanding of their patients' feelings and the feelings of their patients' families does not influence medical or surgical treatment	5.41	5.61	0.026*
It is difficult for a physician to view things from patients' perspectives	4.61	4.65	0.85
Because people are different, it is difficult to see things from patients' perspectives	4.30	4.75	0.004**
Attention to patients' emotions is not important in history taking	6.05	6.16	0.048*
Attentiveness to patients' personal experiences does not influence treatment outcomes	5.47	5.92	0.001**
Patients' illnesses can be cured only by medical or surgical treatment; therefore, physicians' emotional ties with their patients do not have a significant influence in medical or surgical treatment	5.75	5.97	0.14
Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints	5.69	5.94	0.014*
I believe that emotion has no place in the treatment of medical illness	5.99	6.37	0.000**
Physicians should try to think like their patients in order to render better care	2.99	3.03	0.767
Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members	3.09	3.70	0.000**
I do not enjoy reading non-medical literature or the arts	5.58	6.23	0.000**

Item	Mean JSPE score in medical students		Asymp. Sig. (two-tailed)
	Male students	Female students	
Patients feel better when their physicians understand their feelings	6.22	6.39	0.138
Understanding body language is as important as verbal communication in doctor-patient relationships	5.90	6.11	0.065
A physician's sense of humour contributes to a better clinical outcome	5.07	4.84	0.055
Physicians should try to stand in their patients' shoes when providing care to them	5.59	5.81	0.052
Patients value a physician's understanding of their feelings which is therapeutic in its own right	5.71	5.87	0.437
Physicians should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language	5.79	5.93	0.184
Empathy is a therapeutic skill without which the physician's success is limited	5.29	5.78	0.000**
Physicians' understanding of the emotional status of their patients, as well as that of their families is one important component of the physician-patient relationship	5.84	6.10	0.025*
I believe that empathy is an important therapeutic factor in medical treatment	5.83	6.20	0.000**
JSE total Score	106.15	111.30	0.000**

Mann-Whitney test.
 Grouping variable: gender.
 *Significant at $p < 0.05$.
 **Significant at $p < 0.01$.

Table 6. Comparison of the different components of the Jefferson Scale of Physician Empathy, Student version (JSPE-S) in relation to gender.

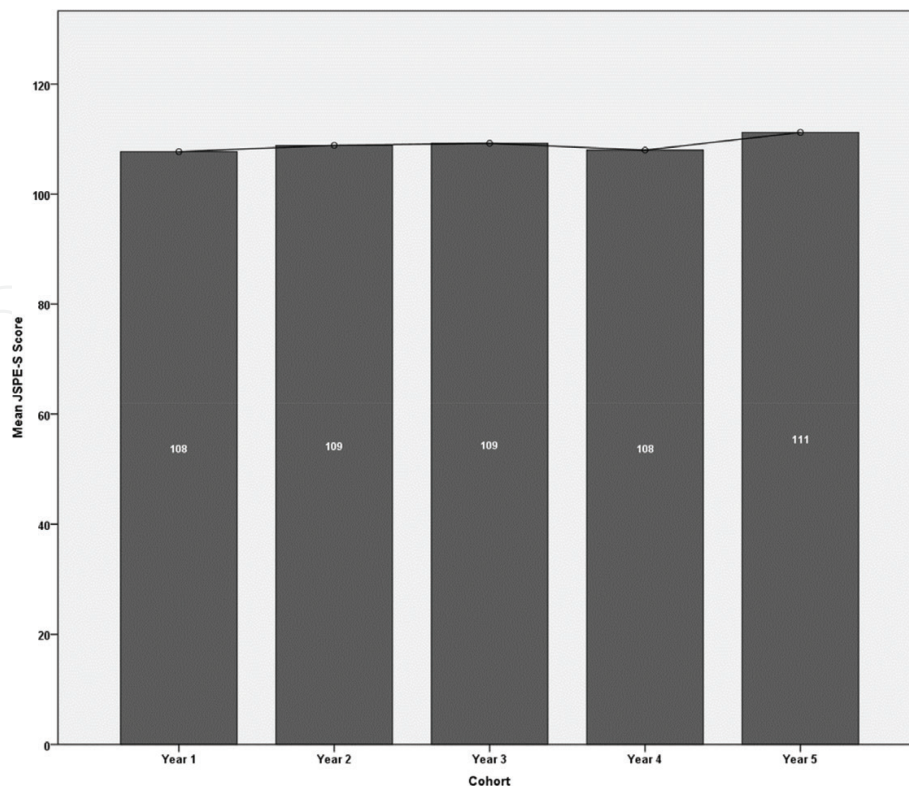


Figure 3. Bar graph showing the mean scores of the Jefferson Scale of Physician Empathy in relation to year of undergraduate medical training.

Despite having lower means, the scores of the above items seemed to significantly increase with an increase in the stage of medical training.

Furthermore, female students showed an increase in the score of items measuring *emotional empathy* as they progressed in their medical training:

- ‘Attention to patients’ emotions is not important in history taking’ (reverse scoring)
- ‘Physicians should not allow themselves to be influenced by strong personal bonds between their patients and their family members’ (reverse scoring)

5. Discussion

The capacity to understand what a patient may be feeling or experiencing is a major component of consulting skills that are required of medical students and practitioners. Acquisition of a body of knowledge and the ability to apply this knowledge in the diagnosis and treatment of patients is important, but an equally important skill is the ability to relate effectively to patients. This is essential to ensure the attainment of a full history and subsequent compliance. Students’ ability to successfully communicate in interviews with patients requires another set of skills. This includes the ability to understand patients’ feelings and experiences (i.e. empathy), and the ability to introspect or to understand one’s own feelings and emotional responses in reaction to patients’ feelings and behaviours (i.e. self-reflection) [42]. The general

view is that empathy declines during medical education [20–24]. To investigate this alleged phenomenon in further detail, we resorted to the current study [43].

5.1. The JSPE scale

Although the JSPE is a self-report measure, it has been shown to correlate with observer ratings of clinical competence as well as with patients' perceptions of physician empathy [44, 45]. The reliability coefficient (Cronbach's Alpha) for the JSPE-S, an indicator for the internal consistency aspect of reliability, was found to be 0.88 among UWS medical students. This is similar to the findings by Hojat et al. [46], in which Cronbach's Alpha was 0.87 for residents and 0.89 for medical students, but is higher than that found in an Italian and a Korean study ($r = 0.85$ and 0.84 , respectively) [47, 48].

The overall mean score for our sample (109.07 ± 14.937) is moderate to high when compared to reported scores in previous studies on medical students. It is lower than that recorded in the USA and Mexico but higher than that reported by Iran and Japan (118.0 ± 9.2 , 110.4 ± 14.1 , 105 ± 12.9 , 104.3 ± 13.1 , respectively) [44, 49–51]. This may be attributed to interpretation issues, cultural differences, students' selection, differences in pedagogical methods and role modeling. However, this area requires further investigation.

The highest score was observed for the item: 'Patients feel better when their physicians understand their feelings'. This is similar to the findings in the Brazilian study by Paro et al., which was conducted on 299 fifth and sixth year medical students [52]. It is a good indication of how students perceive the importance of patients' feelings—a marker for compassionate care [53].

5.2. Empathy and age

No significant associations were found between age and scores of the JSPE-S, although the highest scores were achieved by students above the age of 25. While there was a wide age range in the sample (from 17 to 44), there were only 6 students above the age of 25. This small number of older students in the group makes these results not particularly informative. Nevertheless, the lack of significant association between age and empathy is in concordance with the findings of Austin et al. (2007) [25].

5.3. Empathy and gender

According to our findings, female medical students scored significantly higher on the JSPE-S than male medical students. These gender differences occurred at all stages of the undergraduate medical programme (i.e. years 1–5). Differences in mean scores between female and male students ranged from 4 points (in years 2 and 3) to 12 (in year 4). While a few studies failed to demonstrate higher empathy scores among female students, reportedly due to sampling bias [47, 48, 51, 52], our findings are consistent with the results of a number of studies which suggest that gender differences, in favour of women, exist in relation to empathy [25, 39, 46, 50, 53–57].

Significant differences were found not only in the total JSPE score but also in 11 out of the 20 individual components of the scale. The largest gender difference was observed on the item

related to reading interest: 'I do not enjoy reading non-medical literature or the arts' (where, $Z = -4.871$, $p = 0.000$). This coincides with the findings of Kataoka et al. [50].

Empathy encompasses cognitive and affective/emotional dimensions. The cognitive dimension refers to 'the ability to *understand* the patient's inner experiences and perspective, and a capability to communicate this understanding' [39], whereas the affective dimension refers to the ability to *imagine* the patient's emotions and perspectives [6]. Significant gender differences, in favour of women, were particularly observed in JSPE items which measured the affective component of empathy (7 out of 11). On the other hand, items which showed no significant differences between genders were predominantly cognitive in nature, that is, items which measured the cognitive component of empathy (6 out of 9).

Several explanations have been offered for gender differences in empathy, yet, none have been conclusive. It has been suggested that women are more receptive to emotional signals than men, which can lead to better understanding and, therefore, a better empathic relationship [54]. Recent research by Rueckert and Naybar [58] showed a correlation between right hemisphere activation on the face task and empathy in women only ($p = 0.037$), suggesting a possible neural basis for gender differences in empathy. Mestre et al. [59] followed the empathy levels in male and female adolescents, aged 13–16 years, in a longitudinal study. They concluded that females had a greater empathic response than males of the same age and that the differences grow with age. Significant differences existed in terms of emotional empathy as well as their cognitive capacity to understand experiences and emotions (cognitive empathy).

Current research also focuses on identifying interactions between personal and contextual factors, in particular parenting styles [60, 61]. Parenting styles characterised by affection and emotional support seem to enhance pro-social development and empathy. On the other hand, rigid and hostile parenting facilitates aggression. Carlo et al. [62] analysed parenting styles in relation to gender and reported that girls seem more receptive to affection and support in family relationships.

5.4. Empathy and year of medical training

The results of this study showed no significant difference in empathy scores in relation to the stage of medical training. This finding is contrary to many previous studies which observed a decline in the mean empathy scores, during education, in a variety of health disciplines [21, 26, 63, 64]. Although insignificant, it seems that students may have even developed *more* empathy as they progressed in their training. A cross-sectional study, by Kataoka et al. [65], showed similar findings in Japanese medical students. It showed that the mean empathy scores significantly increased from 98.5 in the first year to 107.8 in the final year of medical school. In our research, the mean empathy scores did increase from 108 to 111, but this increase was insignificant. Another study reported that affective empathy declined in male students, while cognitive empathy was unchanged during medical education [66]. Our research shows that empathy, both affective and cognitive, did not change among male students in relation to medical education, whereas affective empathy increased in female students. It is not clear whether this is an effect of the medical education process or merely a natural development with age.

An interesting observation is that although the score for item 7, that is, 'Attention to patients' emotions is not important in history taking' significantly increases in female students with medical education, the mean score seems to drop after year 3, that is, during the clinical component of the course. Quince et al. [66], using the Interpersonal Reactivity Index, showed a similar finding but in male students.

5.5. Empathy and personal and professional development programmes

The number of students who responded to the items of *Community Medicine* and *Ethics* was too small to be reflective of the total population. Also, there were no significant differences between the scores of those who completed Community Medicine and Ethics and those who had not. Nevertheless, the highest means were recorded by students who had completed Community Medicine and Ethics. These findings indicate that we cannot disregard the effect of personal and professional development programmes on the levels of students' empathy and that further studies, representing the total population and compared to a control group, need to be implemented. Many studies have reported a quantitative increase in student empathy following PPD interventions such as communication skill and interpersonal skill workshops, literature and medicine, patient shadowing and spirituality and wellness courses [42, 67–70]. Such studies suggest that focused educational interventions may be successful at nurturing undergraduate medical students' empathy.

5.6. Empathy and religious beliefs

Despite the absence of a significant difference in empathy scores across different religious beliefs, female atheist/agnostic students seemed to score the highest means. It is not clear whether this difference is related to gender or religiosity. Unfortunately, there is not much on the topic in the literature. Psychologists typically ignore religion, and cognitive scientists have mostly found topics like religion to be an 'embarrassment' [71]. As most people characterise themselves as belonging to a religion—typically Christianity and Islam—about half of the 6.9 billion people on Earth see themselves as falling into one of these two faiths; there has been a recent change in this trend and the topic of religion is deliberated in the literature [71].

A recent study by Saslow et al. [72] reported that compassion, which is an important component of empathy, was related to religious identity. A greater tendency to feel compassion, defined by Goetz et al. [73] as the 'feeling that arises in witnessing another's suffering and that motivates a subsequent desire to help', was observed in the more religious individuals. Yet, greater compassion was related to higher levels of pro-social behaviour among participants who were less religious. Bloom [71] concludes that although there is little evidence of a moral effect of specifically religious beliefs, religion has powerfully good moral effects and powerfully bad moral effects, but these are due to aspects of religion that are shared by other human practices.

5.7. Empathy and ethnicity/culture

Empathy scores did not significantly differ in relation to cultural background of medical students. The highest scores were recorded by the Indigenous Australian students but the

sample size, being only five students, was too small to be statistically valid. There seems to be a general agreement, in the literature, regarding the universality of compassion. However, research shows that the way it is portrayed almost certainly varies across cultures. It is suggested that the capacity to feel compassion may function like a language acquisition tendency similar to how languages differ across cultures, and how they vary according to culturally specific concepts, values, norms and practices [74].

Tsai [75] also reports that cultures vary in their outward display of emotions and that specific lexicon and vocabulary on displaying emotion will depend on the values of that culture.

5.8. Empathy and marital status

The differences between empathy scores in relation to marital status were, again, insignificant. Yet, single mothers showed the highest levels of empathy. Although the sample is too small to be statistically considered, this finding could be potentially explained by integrating Carter's theory with the study of Hodges et al. [76, 77]. Carter [76] suggested that the hormone 'oxytocin' is important for intimate attachments such as marital relationships and interactions with offspring. This theory was backed up by Tops et al. [78] who found plasma oxytocin levels to be strongly associated with attachment defined as the tendency to express and share emotions and feelings with partners or close friends. Hodges et al. [77] examined how having had a similar experience affected three facets of empathy: empathic concern, empathic accuracy and perceived empathy. They concluded that experienced mothers expressed greater empathic concern towards their newborn compared to new mothers. This does not, however, explain why empathy was found to be higher in *single* mothers.

5.9. Empathy and previous education

Although the sample was very much biased, in favour of students without a tertiary degree, students who had a previous arts-related or non-science tertiary degrees showed higher levels of empathy (especially females). This agrees with all previous research suggesting that art, literature, poetry and narrative-based medicine enhance empathy [79–82]. An interesting article by Pauranik [83] titled 'Medical humanities: a resident doctor's perspective' explains how overwork, sleep deprivation and the bombardment of competitive examinations with the pressure of expectations all combine to destroy the dreams that doctors have when they start medical school. She suggests that by integrating medical humanities into the curriculum and sensitising young minds, using the arts, literature, history and lessons on social issues, we may bring about a paradigm shift in that trend.

Possible limitations to this study include the following:

- Findings are based on a cross-sectional design. The possibility of cohort effects cannot be dismissed.
- The survey was conducted at a single medical school. This limits the generalisation of our findings, even though the aim was to identify effective strategies to enhance empathy in undergraduate medical education.

- We utilised a self-reporting scale of empathy. Although the scale was described to be well correlated with observer ratings, there is a possibility that self-reports may have been subjected to biases and discrepancies between self-report and actual behaviour may exist.
- Sampling bias regarding age, Community Medicine and Ethics. The low rate of respondents reporting their age and level of completion of Community Medicine and Ethics programmes may have limited our conclusion regarding the effect of age and personal and professional development programmes on the levels of empathy.
- Lack of clinical exposure of first and second year medical students may have impacted on how the JSPE was interpreted and completed.

6. Conclusion

Empathy is a key concept in the doctor-patient relationship. Empathic engagement is important for the doctor, in terms of patient trust and hence obtaining a thorough history, and for the physical, mental and social well-being of the patient. Our findings suggest that there is a gender difference in the levels of empathy, favouring female medical students. They also suggest that empathy may be preserved in medical school despite prior evidence that a decline is inevitable. Any changes observed in either affective or cognitive empathy, amongst UWS medical students, were small and of limited practical significance. This may be due to careful student selection and/or personal and professional development courses, within the programme, which may have attenuated the decline.

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