

# Maintaining patient-centredness in Australian medical students: Culture, curriculum and selection criteria

C. Harding<sup>1</sup>, A. Seal<sup>1</sup>, R. Vlok<sup>1</sup>, Z. Doyle<sup>2</sup>, A. Dean<sup>3</sup> & J. McGirr<sup>1</sup>

---

## Abstract

**Introduction:** Previous studies have shown that patient-centredness may become eroded as students progress through medical training. The primary objective of this study was to explore the differences in patient-centred attitudes between first- and final-year students in the context of an Australian medical school. The secondary objective was to determine whether student factors such as age, gender, background (rural/urban), discipline of previous degree and specialty of interest were associated with patient-centred attitudes.

**Methods:** This cross-sectional study surveyed 214 first-year and 141 final-year Australian medical students in 2016 and 2017 (total n = 355). Score on the Patient–Practitioner Orientation Scale (PPOS) was the main outcome measure.

**Results:** Anonymous questionnaires were completed by 355 students (76.2%). Mean PPOS score was 4.51 (SD 0.46). Although there was no difference in mean PPOS between first-year and fourth-year students, female respondents were significantly more patient-centred than male respondents (4.58 vs 4.42,  $p = 0.002$ ). Students with an interest in a surgical specialty had significantly lower patient-centredness than students with a non-surgical specialty of interest (4.36 vs 4.55,  $p = 0.002$ ). Having general practice intentions was not associated with higher patient-centredness. Students with a previous humanities-based degree had higher patient-centredness than students with previous degrees in different areas (4.67 vs 4.49,  $p = 0.025$ ).

**Conclusions:** There appears to be no erosion of patient-centredness between first-year and fourth/final-year students. Medical student selection and university culture may have influenced this finding.

**Keywords:** medical students; patient-centredness; Patient–Practitioner Orientation Scale (PPOS)

---

<sup>1</sup> The University of Notre Dame Australia, School of Medicine Sydney, Wagga Wagga Rural Clinical School, Australia

<sup>2</sup> The University of Notre Dame Australia, School of Medicine Sydney, Lithgow Rural Clinical School, Australia

<sup>3</sup> The University of Notre Dame Australia, School of Medicine Sydney, Ballarat Rural Clinical School, Australia

## Correspondence

A/Prof Catherine Harding  
[catherine.harding@nd.edu.au](mailto:catherine.harding@nd.edu.au)

## Introduction

Physician–patient interaction is “a central clinical function” both in terms of obtaining diagnostic information and impact on patient satisfaction and compliance (Simpson et al., 1991, p. 1385). Since the late 1960s, attempts have been made to encourage medical students to explore the impact of emotional problems on illness behaviour and to move from “illness-centred medicine” to “patient-centred medicine” (Balint et al., 1969). A patient-centred approach, taking into account the patient’s desire for information and shared decision making and responding appropriately, has become a widely used concept in medical education (Santana et al., 2018; Stewart, 2001). Not only do patients prefer a collaborative and patient-centred approach to healthcare (Altin et al., 2016; Fallowfield, 2008; Little et al., 2001; Rao et al., 2000; Saha et al., 2011; Williams et al., 1998), patient-centred communication has also been associated with increased resolution of symptoms and improved outcomes in patients with chronic conditions (Stewart et al., 2000) and in the ICU (Goldfarb et al., 2017).

Previous research suggests that traditional medical education may erode patient-centred attitudes of students as they progress through medical school, despite the increasing focus on the need for patient-centred communication in healthcare (Bombeke et al., 2010; Haidet et al., 2002; Wilcox et al., 2017). Although reasons for this decline are uncertain (Spencer, 2004), several have been suggested. These include a “hidden curriculum”, where students face a “professional enculturation” and are taught values such as competitiveness rather than cooperation and teamwork (Hafferty & Franks, 1994; Hafferty et al., 2015; Lawrence et al., 2018) and barriers such as time pressure, tiredness and exposure to non-patient-centred role models (Aper et al., 2015; Bombeke et al., 2010). According to Rosewilliam et al. (2019), students from four health professions identified “role models from placements as the key factor that could either positively or negatively influence development of patient-centred attributes” (p. 11).

It has also been suggested that the culture of medicine has traditionally been “doctor-centred” or paternalistic, and this could contribute to erosion of a curriculum focus on patient-centred medicine (Haidet et al., 2002). Culture, defined as “human knowledge and ways of doing things that is acquired, learned and constructed” (Rapport, 2014, p. 120) can be viewed in medicine as “language, thought processes, styles of communication, customs and beliefs that often characterize the profession” (Boutin-Foster et al., 2008, p. 108). For example, the way in which physicians express themselves can lead to the use of “medical jargon” not always understood by the patient (Boutin-Foster et al., 2008). A conceptual framework for patient-centredness includes the following among the dimensions of an egalitarian relationship between the doctor and the patient: “sharing power and responsibility”, “showing empathy and care” and the “therapeutic relationship”, encouraging patients to voice needs and preferences and offering a collaborative approach (Mead & Bower, 2000, p. 1089).

With the need for patient-centredness in medical practice, research has increasingly explored potential influences on patient-centredness. Curriculum structures, such as longitudinal integrated clerkships (LIC), mentoring and reflection, have been associated with a prevention of erosion in patient-centred attitudes during medical training (Krupat et al., 2009; Ogur et al., 2007). Student demographic factors, such as female gender (Haidet et al., 2002; Hardeman et al., 2015; Krupat et al., 1999; Rosewilliam et al., 2019; Wahlqvist et al., 2010), an interest in primary care as a future specialty (Haidet et al., 2002; Krupat et al., 1999) and previous work in healthcare (Wahlqvist et al., 2010) have been associated with greater patient-centred attitudes. Student ethnicity has also been suggested as a potential influencer of patient-centred attitudes (Haidet et al., 2002; Lee et al., 2008).

**Table 1**

*Comparison With Similar Studies*

Country (study)	Sample size	Year of medical school (duration of course)	Mean PPOS (earliest vs latest survey)	Mean PPOS (male vs female)
USA (Haidet et al., 2002)	n = 510	First-, third- and fourth-year students (4 years)	4.61 vs 4.46 $p = 0.03$	4.65 ± 0.04 vs 4.47 ± 0.03 ( $p < 0.001$ )
USA (Balentine et al., 2010)	n = 236	First- and third-year students (4 years)	4.50 vs 4.54 $p = 3.48$	First year 4.63 vs 4.45; Third year 4.60 vs 4.48 ( $p < 0.003$ )
Greece (Tsimtsiou et al., 2007)	n = 483	Fourth- and sixth-year (6 years)	3.96 vs 3.81 $p < 0.001$	3.96 ± 0.45 vs 3.84 ± 0.45 ( $p < 0.05$ )
Brazil (Ribeiro et al., 2007)	n = 738	1st, 5th, 7th, 9th, 10th, 12th semesters (12 semester/6 years)	4.57 ± 0.43 vs 4.77 ± 0.44 $p < 0.001$	4.72 vs 4.43 ( $p < 0.001$ )
Singapore (Lee et al., 2008)	n = 445	Third year (5 years)	4.10 vs 4.14 $p > 0.05$	4.2 ± 0.4 vs 4.0 ± 0.4 ( $p < 0.001$ )
Sweden (Wahlqvist et al., 2010)	n = 600	All terms (11 terms—6 months per term)	Not reported	4.36 ± 0.36 vs 4.20 ± 0.46 ( $p < 0.001$ )
Pakistan (Ahmad et al., 2015)	n = 783	First to fifth year (5 years)	Values not reported; mean PPOS 3.40 ± 0.49 No significant difference	Values not reported; females had higher mean PPOS ( $p > 0.05$ )

Another strategy that has been employed to improve communication skills and emotional intelligence of medical student cohorts has been student selection (Quinlivan et al., 2010). Selection criteria for medical students in Australia have been increasingly broadened from

a focus on academic performance to a consideration of the personal qualities of applicants, through the use of strategies such as interviews and portfolio submission. While there is limited evidence on selecting students on the basis of values, it has been suggested that this is critically important to delivery of high quality, compassionate and safe healthcare (Patterson et al., 2016).

The wide variation in patterns of patient-centredness attitudes between medical schools in different countries (Table 1) supports the notion that patient-centredness may be influenced by factors such as cultural background and highlights the importance of obtaining data in an Australian context to allow comparison rather than just extrapolating from international results.

This study explored differences in patient-centred attitudes between first- and final-year medical students at a 4-year graduate-entry Australian medical school. It also sought to determine whether student factors such as age, gender, background (rural/urban), discipline of previous degree and speciality of interest were associated with differences in attitudes towards patient-centredness.

## **Methods**

This cross-sectional study of 2016 and 2017 first-year and final/fourth-year medical students at The University of Notre Dame Australia used an anonymous survey to explore the attitudes of medical students towards patient-centred care. Ethics approval was obtained from The University of Notre Dame Australia Human Research Ethics Committee (015166S). Questionnaires were distributed by administration staff not associated with the study to first-year students (2016, n = 118; 2017, n = 112) in their first week of medical school to minimise influence of curriculum and clinical experiences on responses. The survey was distributed to fourth-year students (2016, n = 123; 2017, n = 113) in the second half of the year.

The surveys consisted of general student demographics and the Patient Practitioner Orientation Scale (PPOS), which is a well-validated 18-question, 6-point Likert scale tool used to measure patient-centred attitudes (Haidet et al., 2002). A mean score and two sub-scores (“sharing” and “caring”) were calculated (Haidet et al., 2002). The sharing sub-score reflects the respondent’s belief regarding the degree to which power and information should be shared with the patient. The caring sub-score reflects the respondent’s belief about the importance of interpersonal interaction in medical encounters and the value of caring for the patient as a whole person rather than a medical condition. The highest mean score possible is six, and the lowest is one. Higher scores reflect a stronger orientation towards patient-centredness, whereas lower scores reflect “doctor centredness”.

**Table 2***Demographic Characteristics for First-Year and Final-Year (Fourth-Year) Students*

Characteristics	All first-year students (n = 214)	All fourth-year students (n = 141)	Test statistic	p-value
Female (%)	61.7	56.7	$X^{2b} = 0.827$	0.363
Previous rural life (%)	20.1	21.4	$X^2 = 0.092$	0.761
Rural practice intention (%)	54.6	41.3	$X^2 = 5.847$	0.016
Age range (%)				
20–24 years	55.6	11.4		
25–29 years	32.2	62.1		
30–34 years	7.5	19.3	$X^2 = 71.115$	< 0.001
35+ years	4.7	7.1		
Previous degree <sup>a</sup>				
Humanities	10.7	11.3	$X^2 = 0.031$	0.860
Social sciences	10.3	15.6	$X^2 = 2.218$	0.136
Sciences	53.3	45.4	$X^2 = 2.112$	0.146
Career specific	13.6	17.0	$X^2 = 0.806$	0.369
Healthcare	30.8	36.9	$X^2 = 1.397$	0.237
Highest level of education				
Bachelors	79.3	79.5		
Graduate certificate	3.4	1.7		
Graduate diploma	3.4	9.1	FET <sup>c</sup>	0.132
Masters/PhD	14.0	9.7		
Speciality of interest (%) <sup>a</sup>				
Critical care	26.8	36.2	$X^2 = 3.543$	0.060
General practice	24.9	19.9	$X^2 = 1.214$	0.271
Internal medicine	21.1	24.1	$X^2 = 0.437$	0.509
Obstetrics/gynaecology	8.5	7.5	$X^2 = 0.048$	0.827
Oncology/palliative care	7.5	5.7	$X^2 = 0.454$	0.500
Paediatrics	19.7	10.6	$X^2 = 5.178$	0.023
Psychiatry	5.6	5.7	$X^2 = 0.000$	0.987
Public health	6.6	1.4	$X^2 = 5.223$	0.022
Radiology	2.3	1.4	FET	0.707
Surgery	19.2	23.4	$X^2 = 0.886$	0.347
Other <sup>d</sup>	6.1	4.3	$X^2 = 0.570$	0.450
Mean PPOS [% (SD)]	4.51 (0.45)	4.51 (0.48)	$t(351) = 0.033$	0.974
Sharing sub-score	4.37 (0.56)	4.31 (0.66)	$t(351) = 0.858$	0.392
Caring sub-score	4.66 (0.49)	4.71 (0.48)	$t(351) = -0.994$	0.321

<sup>a</sup> does not add up to 100% as participants could select more than one option<sup>b</sup>  $X^2$ —Chi-square test<sup>c</sup> FET—Fisher's exact test<sup>d</sup> Other includes geriatrics, exercise and sports nutrition, medical administration, pathology and ophthalmology.

Statistical analyses similar to Haidet et al. (2002) were used to allow comparison with published research. SPSS (version 23) was used for statistical analysis, with an alpha of  $p < 0.05$ . Chi-square tests were used to assess for differences in demographic characteristics between first- and final-year respondents between 2016 and 2017 and between genders. Independent samples t-tests and analysis of variance (ANOVA) were used to identify any associations between demographics and mean PPOS and PPOS sub-scores.

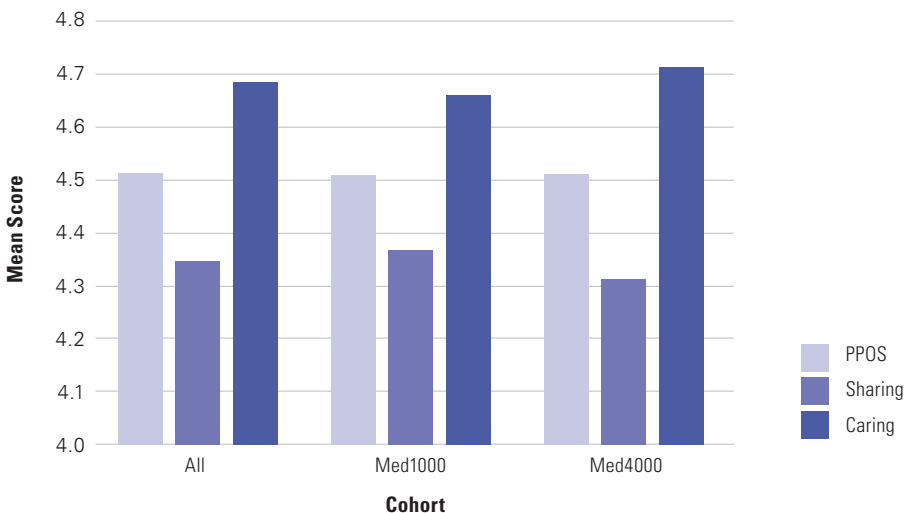
**Results**

There was an overall response rate of 74% (179/241) and 78% (176/225) in 2016 and 2017 students, respectively. Response rates of 93% (first year) and 60% (fourth year) were achieved. Almost 60% (59.7%) of the respondents were females. Nearly 56% of first-year students were under the age of 25 years versus only 11.4% of fourth-year students ( $p < 0.001$ ) (Table 2).

Overall, mean PPOS score was 4.51 (SD 0.46, 95% CI 4.46–4.56), with a range of 2.39–5.78. There was no difference between students in the 2016 and 2017 cohort and no association between age and PPOS score. There was no significant difference in mean PPOS score between first year and fourth year. The mean caring sub-score was 4.68 (SD 0.49, 95% CI 4.63–4.73), and the mean sharing sub-score was 4.34 (SD 0.60, 95% CI 4.28–4.40) (Figure 1). There were no significant differences between first- and fourth-year students in the mean caring or sharing sub-scores. However, female students had significantly higher patient-centred attitudes than male students (4.58 vs 4.42 for males,

**Figure 1**

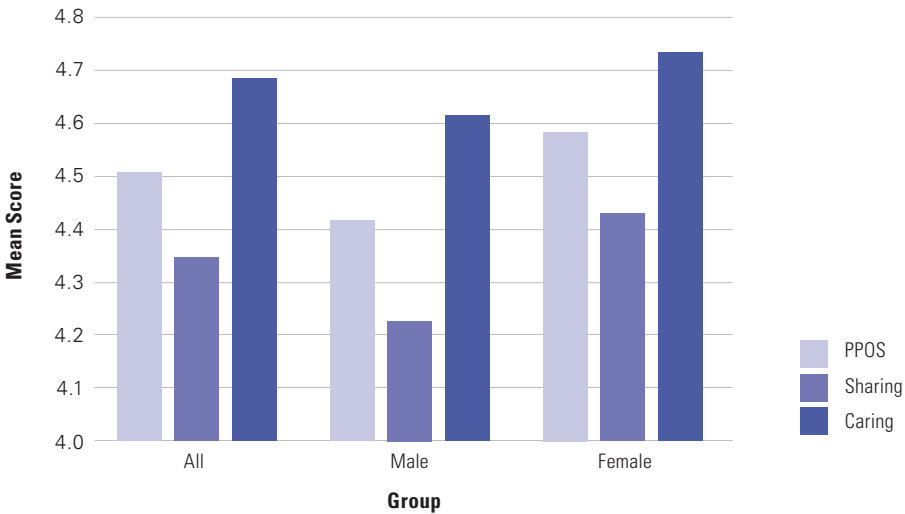
*Mean PPOS Score and Sub-Scores for First (Med 1000) and Final (Med 4000) Year*



$p = 0.002$ ) (Figure 2). This gender bias held true for the first- and fourth-year cohorts individually. Female students had significantly higher sharing (4.43 vs 4.23,  $p = 0.003$ ) and caring (4.73 vs 4.61,  $p = 0.027$ ) sub-scores.

**Figure 2**

*Mean PPOS Score and Sub-Scores for Male and Female Students*



Students with an interest in a surgical specialty had significantly lower mean PPOS scores than students with a different specialty of interest (4.36 vs 4.55,  $p = 0.002$ ). Intention to pursue a career in general practice was not associated with higher patient-centred attitudes. Students with a previous humanities-based degree had higher patient-centredness (mean PPOS score) than students with prior degrees in different areas (4.67 vs 4.49,  $p = 0.025$ ).

## Discussion

This study found no difference in patient-centred attitudes between first- and final-year students over a 2-year period in a graduate medical program. Previous research has shown significant associations between progression through medical school and lower PPOS (patient-centredness) scores. Most students become less patient-centred with time spent studying medicine (Haidet et al., 2002; Krupat et al., 2009; Tsimtsiou et al., 2007), although a small number of international studies (Ahmad et al., 2015; Balentine et al., 2010; Lee et al., 2008) have similarly found no differences in patient-centredness between year groups at medical school. Understanding potential influences on patient-centred attitudes in students, such as gender, cultural and societal backgrounds, curriculum structure and content, and medical student selection criteria may help to develop an understanding of reasons for change in patient-centred attitudes.

Overall, students with a previous humanities-based degree had higher patient-centredness than students with prior degrees in different areas. Hirshfield et al. (2019) found that medical students who had a previous degree in humanities or social science had better communication and interpersonal skills than students with previous degrees in the natural sciences. Jones et al. (2019) suggested that diversity in medical school applicants, including background in the humanities, may create a robust skill set applicable to medical care in non-traditional yet important ways. As effective communication is an important tenet of patient-centred care, our results appear to be a reflection of this intangible skill set.

In previous research, an interest in primary care as a future speciality has been associated with higher PPOS scores than non-primary care specialty career choices (Haidet et al., 2002; Krupat et al., 2000; Ribeiro et al., 2007). This study found that students with an intention to practise in a surgical specialty had lower PPOS scores and that having general practice intentions was not associated with higher patient-centredness scores. The reason for this result in terms of general practice is not clear. In the pre-clinical years, general practitioner role modelling is a major part of curriculum. The majority of problem-based learning (PBL) tutors coming from general practice, and future research exploring a comparison of results across year groups might provide further information.

The finding that female students had significantly higher patient-centred attitudes than male students is consistent with existing research (Ahmad et al., 2015; Ballantine et al., 2010; Haidet et al., 2002; Lee et al., 2008; Ribeiro et al., 2007; Tsimtsiou et al., 2007; Wahlqvist et al., 2010). Female clinicians have been shown to engage in significantly more “partnership behaviours, positive talk, psychosocial counselling, psychosocial question asking, and emotionally focused talk” than male clinicians (Roter & Hall, 2004, p. 497).

As well as an association with gender and choice of specialty, the variety of patterns in PPOS scores between medical schools across the world (Table 1) suggest social and cultural influences on student attitudes towards patient-centeredness. Several studies have noted different PPOS scores in medical students from different ethnic and cultural backgrounds (Ahmad et al., 2015; Ballantine et al., 2010; Haidet et al., 2002; Krupat et al., 2009; Ogur & Hirsh, 2009; Shankar et al., 2006). Lee et al. (2008) noted that students at an East Asian medical school had significantly lower PPOS scores (mean 4.1) than American students of European (mean 4.6) and non-European (mainly Asian, mean 4.3) descent (Haidat et al., 2002). It was noted that students in the USA cohort who were of Asian-American descent had similar PPOS scores to the students in the East Asian cohort. Suggested reasons for these differences in attitudes have included financial burdens faced by students as well as differing community expectations. However, it is also possible that the instrument itself has a degree of cultural bias. Cross-cultural validation of the PPOS has been the focus of several studies. While some translated versions of



the PPOS have acceptable levels of content validity and internal consistency/reliability (Paul-Savoie et al., 2015; Pereira et al., 2013), others reported having good fit for only one sharing or caring sub-score or having better internal consistency after excluding some items of the scale (Perestelo-Perez et al., 2021; Wang et al., 2017).

Some studies have suggested that students from lower income countries are more prone to lower PPOS scores (Ahmad et al., 2015; Haidet et al., 2002; Ogur & Hirsh, 2009; Shankar et al., 2006), however there is some debate around this issue. In one study, students at a privately financed medical school in Pakistan had higher PPOS scores (Ahmad et al., 2015), while Ribeiro et al. (2007) found medical students in Brazil with lower family income had higher PPOS scores.

An alternative explanation may be that financial burdens indirectly contribute towards increased stress and poor learning environments. Focus groups conducted with medical students and their teachers found barriers such as time pressure and tiredness and that non-patient-centred role models and experiences may influence patient-centred attitudes (Bombeke et al., 2010). It has been suggested that lower levels of stress make medical students more open to patient-centred approaches to care (Gordon, 2014). Ahmad et al. (2015) reported that privately financed medical colleges in Pakistan have better student to teacher ratios, and students placed in private hospitals had higher PPOS scores. This is relevant to the current study, as students from The University of Notre Dame Australia also undertake a significant amount of their placements in private hospitals with good student to teacher ratios, which may represent a less stressful learning environment.

Care should be taken in interpretation of these results. This study measured patient-centred attitudes rather than behaviours, and it is well known that barriers exist in translating attitudes to behaviour (Bombeke et al., 2010). In addition, students need to be aware when particular communication styles are appropriate. While medical students with higher patient-centred attitude scores have also been shown to score higher in scored communication judged by patients than students with less patient-centred attitude scores (Hauer et al., 2010), the ability to adapt communications styles may be important rather than a “one-size-fits-all” approach (Balentine et al., 2010). A study comparing physicians’ PPOS scores to those of their patients found that patient satisfaction was associated with physicians’ patient-centred attitude score aligning with that of their patients’, regardless of how high or low that score was (Krupat et al., 2000). While our society increasingly values information sharing in doctor–patient relationships, this has not always been the case and may not be the case for all patients. Between the 1950s and 1970s, at a time when cancer outcomes were poor, most physicians considered it inhumane and damaging to the patient to disclose bad news (Baile et al., 2000). Understanding patient preferences and providing risk information to patients is not without challenges for medical practitioners, as it is difficult to ensure patient understanding of risk and elicit patients’ treatment preferences (Say & Thompson, 2003).

Curriculum content and structure may have played a role in preventing the erosion of patient-centred attitudes in students in this study. Planned curriculum changes have previously been shown to prevent erosion in patient-centredness, with the LIC model and structured mentoring and support being positively associated with patient-centred attitudes in students (Krupat et al., 2009). Continued mentorship is a key component emphasised in LICs. Students in this study had long-term contact with clinical mentors at all stages of the curriculum. Students are placed with clinician tutors in PBL groups in the initial 2 years and one-on-one clinical attachments with senior clinicians in years three and four, when students rotate through public and private clinical settings. It has been suggested that positive role modelling is a key technique in teaching patient-centred attitudes (Branch et al., 2001; Gilligan et al., 2020). Through interviews with clinicians and medical students, Gilligan et al. (2020) highlighted the need for “mentors or role-models in clinical settings who can model patient-centred communication approaches and provide feedback to students on their own consultations with patients” (p. 7).

Similar to other medical schools, The University of Notre Dame Australia employs “reflection” as a mode of assessment and teaches patient-centred communication. Given the potential influence of non-patient-centred role models (Archer & Myer, 2021; Bombeke et al., 2010), encouraging students to critically reflect on clinical interactions may potentially allow them to identify behaviours in senior clinicians that they do not wish to imitate, leading to a resistance against the hidden curriculum and the erosion of patient-centredness. Wilcox et al. (2017) reported that “students’ perceptions of the patient-centredness of the learning environment decreased as students progressed through medical school, despite increasing exposure to patients” (p. 44) and “that patient-centredness should be explicitly taught and that focus should be on the attitudes and behaviours modelled by clinicians in the clinical years” (p. 44). Additional curriculum components that may play a role in the prevention of erosion of patient-centredness include an emphasis on pastoral care for students and an expectation that students complete a concurrent liberal arts education.

Previous research has shown students with clinical placements in private hospitals had more patient-centred attitudes (Ahmad et al., 2015), potentially due to improved learning conditions in private hospitals or different behaviours role modelled by senior clinicians in this setting. This is an interesting consideration, as medical education in Australia is currently increasingly engaging with the private sector (Metz et al., 2013; Tiong et al., 2013) and a substantial portion of The University of Notre Dame Australia clinical teaching is in the private setting.

The potential role of selection criteria warrants consideration in relation to the results of this study. Although the university’s specific curriculum may have played a role in maintaining patient-centred attitudes throughout the medical degree, it does not explain the lack of variation in PPOS scores between students of different demographics in those

surveyed in the first week of medical school. As a Catholic university with graduate entry, students applying for the program may have different personal values to the general Australian population. In a study examining the factors that medical students consider in clinical decision making, Moyo et al. (2019) found that “students who prioritised spirituality placed more emphasis on patient-centred factors, and less emphasis on clinical factors in different scenarios” (p. 64). This could contribute to the high level of patient-centred attitudes at the first and final year of medical school. The University of Notre Dame Australia also employs selection criteria that are uncommon in Australia. In addition to grade point average, performance in standardised entry examinations (GAMSAT) and an interview process, applicants are required to submit a portfolio, outlining experience with aspects such as “contribution to community”. Selection for such attributes may contribute to the universally stable patient-centred attitudes across years and many demographics. These results contribute to the dialogue around tailoring selection criteria for student attributes such as patient-centred attitudes (Patterson et al., 2016).

In addition to the aforementioned implications regarding selection criteria, there is scope for research into curriculum-specific modifications/improvements. Practising communication techniques with peers was seen as having minimal benefit due to the similar skill base, and mock interviews often caused anxiety, whereas the “most highly valued practice opportunities were those with real patients” (Gilligan et al., 2020, p. 5). While the selection criteria, clinical role modelling and learning reflexive practice discussed may have influenced the stability of patient-centred attitudes in these medical students, further research is needed to elucidate the individual contribution of each component. This would have implications not just for medical students but for healthcare more broadly, as patient-centred collaborative care is increasingly being seen as a measure of a successful healthcare-team approach.

### ***Limitations***

Although this cross-sectional study aimed to determine whether a difference existed between first- and final-year students’ patient-centred attitudes, a longitudinal study may provide a more accurate depiction of the evolution of these attitudes over time. The lower response rates by fourth-year students could reflect students with eroded attitudes in relation to patient-centredness were opting to not participate in the research. However, as one final-year clinical school, in particular, had lower response rates, this may be attributed to difficulties with coordination of the survey at that school and pressures on final-year medical student time rather than selection bias.

### **Conclusion**

This study found that attitudes towards patient-centredness did not differ between first- and final-year medical students from a graduate program at a Catholic university. The

lack of variation in patient-centred attitudes, even among first-year students, suggests that specific selection criteria may be employed to select for students resistant to erosion of patient-centredness. While the scope of the study does not allow us to determine causation, possibilities include the curriculum employed by the medical school, which has a strong emphasis on pastoral care and ongoing mentorship in PBL tutorials.

### Conflicts of interest and funding

The authors report no conflicts of interest or external funding for this study.

### References

- Ahmad, W., Krupat, E., Asma, Y., Fatima, N. E., Attique, R., Mahmood, U., & Waqas, A. (2015). Attitudes of medical students in Lahore, Pakistan towards the doctor–patient relationship. *Peer Journal*, 3, e1050. <https://doi.org/10.7717/peerj.1050>
- Altin, S. V., & Stock, S. (2016). The impact of health literacy, patient-centered communication and shared decision-making on patients' satisfaction with care received in German primary care practices. *BMC Health Services Research*, 16(1), Article 450. <http://doi.org/10.1186/s12913-016-1693-y>
- Archer, E., & Meyer, I. S. (2021). Applying empathic communication skills in clinical practice: Medical students' experiences. *South African Family Practice*, 63(1), e1–e5. <https://doi.org/10.4102/safp.v63i1.5244>
- Aper, L., Veldhuijzen, W., Dornan, T., van de Ridder, M., Koole, S., Derese, A., & Reniers, J. (2015). “Should I prioritise medical problem solving or attentive listening?”: The dilemmas and challenges that medical students experience when learning to conduct consultations. *Patient Education and Counseling*, 98(1), 77–84. <https://doi.org/10.1016/j.pec.2014.09.016>
- Baile, W. F., Buckman, R., Lenzi, R., Glober, G., Beale, E. A., & Kudelka, A. P. (2000). SPIKES—A six-step protocol for delivering bad news: Application to a patient with cancer. *The Oncologist*, 5(4), 302–311. <https://doi.org/10.1634/theoncologist.5-4-302>
- Balentine, C., Ayanbule, F., Haidet, P., Rogers, J., Thompson, B., Chang, T., Horwitz, I., Tseng, E., & Berger, D. H. (2010). The patient–physician relationship in surgical students. *American Journal of Surgery*, 200(5), 624–627. <https://doi.org/10.1016/j.amjsurg.2010.07.004>
- Balint, M., Ball, D., & Hare, M. (1969). Training medical students in patient-centred medicine. *Comprehensive Psychiatry*, 10(4), 249–258. [https://doi.org/10.1016/0010-440x\(69\)90001-7](https://doi.org/10.1016/0010-440x(69)90001-7)
- Bombeke, K., Symons, L., Debaene, L., De Winter, B., Schol, S., & Van Royen, P. (2010). Help, I'm losing patient-centredness! Experiences of medical students and their teachers. *Medical Education*, 44(7), 662–673. <https://doi.org/10.1111/j.1365-2923.2010.03627.x>
- Boutin-Foster, C., Foster, J. C., & Konopasek, L. (2008). Physician, know thyself: The professional culture of medicine as a framework for teaching cultural competence. *Academic Medicine*, 83(1), 106–111. <https://doi.org/10.1097/ACM.0b013e31815c6753>
- Branch, W. T., Jr., Kern, D., Haidet, P., Weissmann, P., Gracey, C. F., Mitchell, G., & Inui, T. (2001). Teaching the human dimensions of care in clinical settings. *JAMA*, 286(9), 1067–1074. <https://doi.org/10.1001/jama.286.9.1067>
- Fallowfield, L. (2008). Treatment decision-making in breast cancer: The patient–doctor relationship. *Breast Cancer Research and Treatment*, 112(1), 5–13. <https://doi.org/10.1007/s10549-008-0077-3>

- Gilligan, C., Brubacher, S. P., & Powell, M. B. (2020). Assessing the training needs of medical students in patient information gathering. *BMC Medical Education*, 20(1), Article 61. <https://doi.org/10.1186/s12909-020-1975-2>
- Goldfarb, M. J., Bibas L., Bartlett, V., Jones, H., & Khan, N. (2017). Outcomes of patient- and family-centered care interventions in the ICU: A systematic review and meta-analysis. *Critical Care Medicine*, 45(10), 1751–1761. <https://doi.org/10.1097/CCM.0000000000002624>
- Gordon, J. S. (2014). Mind–body skills groups for medical students: Reducing stress, enhancing commitment, and promoting patient-centered care. *BMC Medical Education*, 14(1), Article 198. <https://doi.org/10.1186/1472-6920-14-198>
- Hafferty, F., & Franks, R. (1994). The hidden curriculum, ethics teaching, and the structure of medical education. *Academic Medicine*, 69(11), 861–871. <https://doi.org/10.1097/00001888-199411000-00001>
- Hafferty, F. W., Gaufberg, E. H., & O'Donnell, J. F. (2015). The role of the hidden curriculum in “on doctoring” courses. *AMA Journal of Ethics*, 17(2), 130–139. <https://journalofethics.ama-assn.org/sites/journalofethics.ama-assn.org/files/2018-05/medu1-1502.pdf>
- Haidet, P., Dains, J. E., Paterniti, D. A., Hechtel, L., Chang, T., Tseng, E., & Rogers, J. C. (2002). Medical student attitudes toward the doctor–patient relationship. *Medical Education*, 36(6), 568–574. <https://doi.org/10.1046/j.1365-2923.2002.01233.x>
- Hardeman, R. R., Burgess, D., Phelan, S., Yeazel, M., Nelson, D., & van Ryn, M. (2015). Medical student socio-demographic characteristics and attitudes toward patient centered care: Do race, socioeconomic status and gender matter? A report from the Medical Student CHANGES study. *Patient Education and Counseling*, 98(3), 350–355. <https://doi.org/10.1016/j.pec.2014.11.013>
- Hauer, K. E., Boscardin, C., Gesundheit, N., Nevins, A., Srinivasan, M., & Fernandez, A. (2010). Impact of student ethnicity and patient-centredness on communication skills performance. *Medical Education*, 44(7), 653–661. <https://doi.org/10.1111/j.1365-2923.2010.03632.x>
- Hirshfield, L. E., Yudkowsky, R., & Park, Y. S. (2019). Pre-medical majors in the humanities and social sciences: Impact on communication skills and specialty choice. *Medical Education*, 53(4), 408–416. <https://doi.org/10.1111/medu.13774>
- Jones, E. K., Kumagai, A. K., & Kittendorf, A. L. (2019). Through another lens: The humanities and social sciences in the making of physicians. *Medical Education*, 53(4), 328–330. <https://doi.org/10.1111/medu.13817>
- Krupat, E., Hiam, C., Fleming, M., & Freeman, P. (1999). Patient-centredness and its correlates among first year medical students. *International Journal of Psychiatry in Medicine*, 29(3), 347–356. <https://doi.org/10.2190/DVCQ-4LC8-NT7H-KE0L>
- Krupat, E., Pelletier, S., Alexander, E. K., Hirsh, D., Ogur, B., & Schwartzstein, R. (2009). Can changes in the principal clinical year prevent the erosion of students’ patient-centered beliefs? *Academic Medicine*, 84(5), 582–586. <https://doi.org/10.1097/acm.0b013e31819fa92d>
- Krupat, E., Rosenkranz, S. L., Yeager, C. M., Barnard, K., Putnam, S. M., & Inui, T. S. (2000). The practice orientations of physicians and patients: The effect of doctor–patient congruence on satisfaction. *Patient Education and Counseling*, 39(1), 49–59. [https://doi.org/10.1016/S0738-3991\(99\)00090-7](https://doi.org/10.1016/S0738-3991(99)00090-7)

- Lawrence, C., Mhlaba, T., Stewart, K. A., Moletsane, R., Gaede, B., & Moshabela, M. (2018). The hidden curricula of medical education: A scoping review. *Academic Medicine*, *93*(4), 648–656. <https://doi.org/10.1097/acm.0000000000002004>
- Lee, K., Seow, A., Luo, N., & Koh, D. (2008). Attitudes towards the doctor–patient relationship: A prospective study in an Asian medical school. *Medical Education*, *42*(11), 1092–1099. <https://doi.org/10.1111/j.1365-2923.2008.03157.x>
- Little, P., Everitt, H., Williamson, I., Warner, G., Moore, M., Gould, C., Ferrier, K., & Payne, S. (2001). Preferences of patients for patient-centred approach to consultation in primary care: Observational study. *BMJ*, *322*(7284), 468–472. <https://doi.org/10.1136/bmj.322.7284.468>
- Mead, N., & Bower, P. (2000). Patient-centredness: A conceptual framework and review of the empirical literature. *Social Science Medicine*, *51*(7), 1087–1110. [https://doi.org/10.1016/s0277-9536\(00\)00098-8](https://doi.org/10.1016/s0277-9536(00)00098-8)
- Metz, G., Catford, J., & Kinkade, A. (2013). Attitudes of a private hospital community to medical student teaching. *Medical Journal of Australia*, *199*(6), 396. <https://doi.org/10.5694/mja13.10869>
- Moyo, M., Shulruf, B., Weller, J., & Goodyear-Smith, F. (2019). Effect of medical students' values on their clinical decision-making. *Journal of Primary Health Care*, *11*(1), 64–74. <https://doi.org/10.1071/hc18055>
- Ogur, B., & Hirsh, D. (2009). Learning through longitudinal patient care: Narratives from the Harvard Medical School–Cambridge integrated clerkship. *Academic Medicine*, *84*(7), 844–850. <https://doi.org/10.1097/acm.0b013e3181a85793>
- Ogur, B., Hirsh, D., Krupat, E., & Bor, D. (2007). The Harvard Medical School–Cambridge integrated clerkship: An innovative model of clinical education. *Academic Medicine*, *82*(4), 397–404. <https://doi.org/10.1097/acm.0b013e31803338f0>
- Patterson, F., Prescott-Clements, L., Zibarras, L., Edwards, H., Kerrin, M., & Cousans, F. (2016). Recruiting for values in healthcare: A preliminary review of the evidence. *Advances in Health Science Education Theory and Practice*, *21*(4), 859–881. <https://doi.org/10.1007/s10459-014-9579-4>
- Paul-Savoie, E., Bourgault, P., Gosselin, E., Potvin, S., & Lefrenaye, S. (2015). Assessing patient-centre care: Validation of the French version of the patient–practitioner orientation scale (PPOS). *European Journal for Person Centred Healthcare*, *3*(3): 295–302. <http://www.ejpch.org/ejpch/article/view/956/0>
- Pereira, C. M. A. S., Amaral, C. F. S., Ribeiro, M. M. R., Paro, H. B. M. S., Pinto, R. M. C., Reis, L. E. T., Silva, C. H. M., & Krupat, E. (2013). Cross-cultural validation of the Patient–Practitioner Orientation Scale (PPOS). *Patient Education and Counseling*, *91*(1), 37–43. <https://doi.org/10.1016/j.pec.2012.11.014>
- Perestelo-Pérez, L., Rivero-Santana, A., González-González, A. I., Bermejo-Caja, C. J., Ramos-García, V., Koatz, D., Torres-Castaño, A., Ballester, M., Muñoz-Balsa, M., del Rey-Granado, Y., Pérez-Rivas, F. J., Canellas-Criado, Y., Ramírez-Puerta, A. B., Pacheco-Huergo, V., & Orrego, C. (2021). Cross-cultural validation of the patient-practitioner orientation scale among primary care professionals in Spain. *Health Expectations*, *24*(1), 33–41. <https://doi.org/10.1111/hex.13135>
- Quinlivan, J., Lam, L., Wan, S., & Petersen, W. (2010). Selecting medical students for academic and attitudinal outcomes in a Catholic medical school. *Medical Journal of Australia*, *193*(6), 347–350. <https://doi.org/10.5694/j.1326-5377.2010.tb03947.x>

- Rao, J., Weinberger, M., & Kroenke, K. (2000). Visit-specific expectations and patient-centered outcomes: A literature review. *Archives of Family Medicine*, 9(10), 1148–1155. <https://doi.org/10.1001/archfami.9.10.1148>
- Rapport, N. (2014). *Social and cultural anthropology: The key concepts* (3rd ed.). Routledge.
- Ribeiro, M., Krupat, E., & Amaral, C. (2007). Brazilian medical students' attitudes towards patient-centered care. *Medical Teacher*, 29(6), e204–e208. <https://doi.org/10.1080/01421590701543133>
- Rosewilliam, S., Indramohan, V., Breakwell, R., & Skelton, J. (2020). Learning to be patient-centred healthcare professionals: How does it happen at university and on clinical placements? A multiple focus group study. *MedEdPublish*, 9(53). <https://doi.org/10.15694/mep.2020.000053.1>
- Roter, D. L., & Hall, J. A. (2004). Physician gender and patient-centered communication: A critical review of empirical research. *Annual Review of Public Health*, 25, 497–519. <https://doi.org/10.1146/annurev.publhealth.25.101802.123134>
- Saha, S., & Beach, M. C. (2011). The impact of patient-centered communication on patients' decision making and evaluations of physicians: A randomized study using video vignettes. *Patient Education and Counseling*, 84(3), 386–392. <https://doi.org/10.1016/j.pec.2011.04.023>
- Santana, M. J., Manalili, K., Jolley, R. J., Zelinsky, S., Quan, H., & Lu, M. (2018). How to practice person-centre care: A conceptual framework. *Health Expectations*, 21(2), 429–440. <https://doi.org/10.1111/hex.12640>
- Say, R. E., & Thompson, R. (2003). The importance of patient preferences in treatment decisions: Challenges for doctors. *BMJ*, 327(7414), 542–545. <https://doi.org/10.1136/bmj.327.7414.542>
- Shankar, P. R., Dubey, A. K., Subish, P., & Deshpande, V. Y. (2006). Attitudes of first-year medical students towards the doctor patient relationship. *Journal of Nepal Medical Association*, 45(161), 196–203. <https://pubmed.ncbi.nlm.nih.gov/17160097/>
- Simpson, M., Buckman, R., Stewart, M., Maguire, P., Lipkin, M., Novack, D., & Till, J. (1991). Doctor-patient communication: The Toronto consensus statement. *BMJ*, 303(6814), 1385–1387. <https://doi.org/10.1136/bmj.303.6814.1385>
- Spencer, J. (2004). Decline in empathy in medical education: How can we stop the rot? *Medical Education*, 38(9), 916–918. <https://doi.org/10.1111/j.1365-2929.2004.01965.x>
- Stewart, M. (2001). Towards a global definition of patient-centred care. *BMJ*, 322(2784), 444–445. <https://doi.org/10.1136/bmj.322.7284.444>
- Stewart, M., Brown, J. B., Donner, A., McWhinney, I. R., Oates, J., Weston, W. W., & Jordan, J. (2000). The impact of patient-centered care on outcomes. *Journal of Family Practice*, 49(9), 796–804. <https://www.mdedge.com/jfponline/article/60893/impact-patient-centered-care-outcomes>
- Tiong, M., Levinson, M., Oldroyd, J., & Staples, M. (2013). How receptive are patients to medical students in Australian hospitals? A cross-sectional survey of a public and a private hospital. *Internal Medicine Journal*, 43(4), 373–380. <https://doi.org/10.1111/j.1445-5994.2012.02887.x>
- Tsimtsiou, Z., Kerasidou, O., Efstathiou, N., Papaharitou, S., Hatzimouratidis, K., & Hatzichristou, D. (2007). Medical students' attitudes toward patient-centred care: A longitudinal survey. *Medical Education*, 41(2), 146–153. <https://doi.org/10.1111/j.1365-2929.2006.02668.x>
- Wahlqvist, M., Gunnarsson, R., Dahlgren, G., & Nordgren, S. (2010). Patient-centred attitudes among medical students: Gender and work experience in health care make a difference. *Medical Teacher*, 32(4), e191–e198. <https://doi.org/10.3109/01421591003657451>

- Wang, J., Zou, R., Fu, H., Qian, H., Yan, Y., & Wang, F. (2017). Measuring the preference towards patient-centred communication with the Chinese-revised Patient–Practitioner Orientation Scale: A cross-sectional study among physicians and patients in clinical settings in Shanghai, China. *BMJ Open*, 7(9), e016902. <https://doi.org/10.1136/bmjopen-2017-016902>
- Wilcox, M. V., Orlando, M. S., Rand, C. S., Record, J., Christmas, C., Ziegelstein, R. C., & Hanyok, L. A. (2017). Medical students' perceptions of the patient-centredness of the learning environment. *Perspectives on Medical Education*, 6(1), 44–50. <https://doi.org/10.1007/s40037-016-0317-x>
- Williams, S., Weinman, J., & Dale, J. (1998). Doctor–patient communication and patient satisfaction: A review. *Family Practice*, 15(5), 480–492. <https://doi.org/10.1093/fampra/15.5.480>