



Medical students' attitude toward patient-centeredness: A longitudinal study

Stefano Ardenghi^{a,b,1}, Selena Russo^{a,2}, Giulia Rampoldi^{a,3}, Marco Bani^{a,4}, Maria Grazia Strepparava^{a,b,*,5}

^a School of Medicine and Surgery, University of Milano-Bicocca, Monza, Italy

^b Fondazione IRCCS San Gerardo dei Tintori, Monza, Italy

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ABSTRACT

Objectives: This study explored the trajectories of patient-centered orientation in a sample of Italian medical students throughout medical school.

Methods: Four consecutive student cohorts were longitudinally assessed at the second (T0) and fifth year (T1) of medical school. Students completed a questionnaire including demographics and the Italian validated version of the Patient-Practitioner Orientation Scale.

Results: 352 students completed both administrations. Students became more patient-centered in terms of Sharing along the course of their clinical curriculum, whereas there were no significant changes in Caring. Groups with distinct developmental trajectory patterns of both Caring and Sharing were identified. Students high in patient-centeredness at T0 reported significantly lower scores at T1 while students with lower scores at T0 significantly increased from the first to the last measurement. Female students significantly outscored their male colleagues on Caring and Sharing in both administrations.

Conclusions: Findings call for innovative education strategies to sustain patient-centeredness attitudes in medical students entering hospital-based clinical medicine. Further research is needed to identify characteristics of the medical curriculum that are primarily involved in fostering students' patient-centeredness.

Practice Implications: Including the assessment and monitoring of patient-centeredness throughout the medical school can inform tailored education aiming to foster this dimension.

1. Introduction

Patient-centered care is about treating a person receiving healthcare with dignity and respect, and involving them in all decisions about their health [1]. Patient-centered care is widely recognized as an essential element of a high-quality healthcare system [2] and a key component of a functional and effective doctor-patient relationship [3]. Patient-centeredness (PC) can be considered as an attitude that enables physicians to achieve desirable outcomes such as patient satisfaction [4], treatment adherence [5,6], empathic therapeutic relationship [7], physical health [8], and positive change in patients' health behaviors

[9]. Furthermore, PC is associated with cost-effective care [10], reduced complaints and litigations, and less work-related stress and burnout syndrome in healthcare professionals [11].

PC comprises two components: Caring and Sharing [12]. Caring refers to the degree to which professionals show empathy and warmth and acknowledge and treat patients as whole persons, while Sharing concerns healthcare professionals' attitudes about sharing information, decisions, and power with their patients [13]. Patient-centered physicians care about patients' emotions and try to see the illness through the patients' perspective by exploring patients' feelings, beliefs, and expectations and respect their autonomy and personal values. Moreover,

* Correspondence to: Via Cadore 48, Monza 20900, MB, Italy.

E-mail address: mariagrazia.strepparava@unimib.it (M.G. Strepparava).

¹ ORCID: 0000-0002-7057-1269

² ORCID: 0000-0002-3024-3316

³ ORCID: 0000-0003-2908-2735

⁴ ORCID: 0000-0002-6500-6513

⁵ ORCID: 0000-0001-5068-8753

patient-centered physicians communicate cooperatively with their patients, share information, and engage them, as equals, in the treatment process.

The educational process aiming to turn students into doctors able to care for another human being and to perceive the patient as an intentional agent, active decision-maker, and partner in the treatment process has to foster patient-centered orientation. While current research is mainly focusing on the psycho-attitudinal factors promoting well-being and empathic patient-centered attitudes among healthcare students and professionals [14–21], only a few studies have explored PC changes in medical and healthcare students throughout their education. The role of the medical education path is not clear-cut and the debate on the trajectories and intensity of PC changes throughout medical school is still ongoing. While some studies have found an increase or stability of PC levels [22] others have shown a significant decline in self-reported PC in medical students during their studies [23–25].

These findings mirror the one emerging from investigations on empathy in medical students with some studies founding a significant decline in self-reported empathy during studies [26–28], and others unveiling an increase or stability in empathy levels [29–32]. The discrepancy of these findings has been linked to the different features of medical curricula with medical school programs more focused on technical skills and less interested on communication and soft skills often reporting a decline in students' empathy [33]. The decrease in both empathy and PC has been often ascribed to a widespread culture in the medical education field which focuses more on diseases rather than on patients' illnesses [34], and to the "hidden curriculum" which is a complex and multifaceted set of often unspoken cultural or behavioral norms [35], an institutional-level concept reflecting in policy development, evaluation, resource allocation, and institutional slang [36]. When it comes to gender, female medical students reported higher levels of PC than their male counterparts [37,38]. Being female has been found to be associated with greater PC [34,39], and with self-transcending personal values [40,41].

The present longitudinal study aimed to:

- describe the distribution of PC levels in medical students;
- describe the trajectories of PC dimensions in undergraduate Italian medical students as they progressed in their study;
- investigate whether gender differences in PC are confirmed in this study population and whether they remain constant throughout medical school.

1.1. The medical school program at the study center

The degree programs in Medicine and Surgery in Italy last six years with all national curricula being substantially aligned. The organization and academic contents are similar throughout the country with the first two years being considered pre-clinical and with minimal interaction with patients, while the remaining four years provide students with clinical clerkship experiences. As for the pre-clinical and clinical subjects, at the Medical School of the University of Milano-Bicocca, Milan (Italy) in the first two years students attend the main basic sciences classes including Human Anatomy and Histology, Biology, Chemistry, Genetics, and Physiology, while in the following years students attend clinical disciplines such as Dermatology, Gynecology, Orthopedics, Pharmacology, Psychiatry, Pediatrics, and Pathology. In the second year, a mandatory one-week observational training experience at a General Practitioner's (GP) office is planned. This training exposes students to real-life applications of the bio-psycho-social model of medical conditions and offers them a space to discuss the experience through debriefing activities. Clinical clerkship at hospitals' wards is outlined throughout the following academic years.

The formal and structured formative activities targeting communication and relational abilities are the second-year theoretical-practical

course "Communication Skills" and the fifth-year course "Clinical Psychology". Both courses are compulsory and equip students with theoretical knowledge and practical strategies on the interpersonal skills necessary to manage functional and effective doctor-patient encounters. They include frontal lessons as well as hands-on activities (e.g., role-playing) on how to manage and regulate emotions emerging during doctor-patient interactions and have been developed according to the core curriculum defined by the Permanent Italian Conference of the Directors of Undergraduate Medical Schools [42].

2. Methods

2.1. Participants and procedure

This study was conducted across seven years (from the academic year 2014/2015 to the academic year 2020/2021) comprising four consecutive student cohorts entering the Medical School of the University of Milano-Bicocca in 2013, 2014, 2015, and 2016. Participants filled in paper-and-pencil questionnaires at the first semester of their second year of medical school (T0) and the beginning of their fifth academic year (T1). At T0 students were approached and invited to take part in the study at the first scheduled class of "Communication Skills" while at T1 students were approached after the final scheduled class of "Clinical Psychology". As described above, students at T0 had not been exposed to any clinical experiences but focused on basic sciences courses. Between T0 and T1 students had attended classes on clinical disciplines and underwent 675 h of clerkship (corresponding to 27 ECTS).

The present study focused on the intertwined CLinical and EDUcational activities carried out between the beginning of year 2 to the beginning of year 5 (CLEDU2to5) which includes the "Communication Skills" course (year 2), GP's office experience (year 2), clinical clerkship (from year 3 to 5), and "Clinical Psychology" course (year 5). These are the only formal activities that provide students with the opportunity to be exposed to and reflect on the doctor-patient relationship during the study center medical school program (see Table 1). All participants provided written informed consent. This study was approved by the Ethical Committee of the University of Milano-Bicocca (Protocol number: 39927).

2.2. Materials

Self-reported questionnaires elicited information on socio-demographic characteristics, academic identification number, and PC which was measured with the Patient-Practitioner Orientation Scale – 8 item – Italian version (PPOS-8-IT) [43]. The PPOS-8-IT is the Italian short version of the original 16-item Patient-Practitioner Orientation Scale (PPOS) [12]. This self-report questionnaire is composed of 8 items rated on a 6-point Likert scale (from 1 = "strongly agree" to 6 = "strongly disagree"). As all items report positions in contrast with patient-centred principles, higher scores indicate higher patient-centred orientation. The questionnaire evaluates two dimensions of PC, namely Caring (4 items) and Sharing (4 items). High levels of Caring mean that respondents believe in a holistic and supporting approach to care. High levels of Sharing highlight that respondents believe in an egalitarian patient-physician relationship. In this study, the reliability of the PPOS-8-IT subscales measured by Cronbach's alpha was .75 (T0) and .73 (T1) for PPOS-8-IT Caring, and .77 (T0) and .72 (T1) for PPOS-8-IT Sharing.

2.3. Statistical analyses

Possible differences between student cohorts were explored. A set of independent-sample Student's t-tests explored the gender differences in PPOS-8-IT scores at both T1 and T0. A set of analyses of variance (ANOVA) for repeated measure was used to explore changes in PPOS-8-IT Caring and Sharing scores between T0 and T1 while controlling for

Table 1
Content of the CLEDU2to5 activities.

Learning activity	Year	Hours and modality	ECTS	Objectives
Communication Skills course	2	24 h of frontal lessons + 12 h of practical classroom activities	3	Psychological and relational aspects of the doctor-patient relationship; communication techniques; the Calgary Cambridge model to medical interview; motivational interview techniques; the S.P.I.K.E. S. approach to break bad news.
Doctor shadowing	2	16 h	1	Mandatory one-week observational training experience at a General Practitioner's office.
Clerkship at hospital wards	3 and 4	675 h (year 3 = 375 h; year 4 = 300 h)	27	The clerkship program provides bedside teaching aimed at: properly collecting anamnesis and data; carrying out a general objective examination and clinical reasoning on laboratory evidence; applying theory and model of medical interview; establishing a functional relationship with patients; considering criteria of professional ethics.
Clinical Psychology course	5	12 h of frontal lessons + 12 h of practical classroom activities	2	Etiology and treatments in psychopathology; subjective dimension of the disease and its emotional impact; tools to understand and regulate relational aspects; therapeutic alliance; reflection on relational and communication aspects of clinical clerkship.

Note. ECTS European Credit Transfer System

gender. As PPOS does not have cut-off values to characterize PC levels, quartiles analysis offered an alternative solution to consider level distributions amongst participants. We calculated and reported the effect size estimates partial eta-squared (η^2_p) and Cohen's *d* for the repeated ANOVA and t-tests, respectively. Bonferroni correction was used for multiple comparisons and the results of statistical analyses were considered significant if the p-value was $< .025$. The analyses were performed using the IBM SPSS Statistics version 26 for Mac.

3. Results

3.1. Study participants and descriptive statistics

Four consecutive cohorts of Italian second-year medical students ($N = 576$) enrolled at the Medical School of the University of Milano-Bicocca were invited to participate in this study. Five hundred and thirty-eight students (response rate = 93.4%) agreed to participate and completed the assessment at T0 and 352 students (65.4%) completed the T1 assessment. Female students were 288 (53.5%) at T0 and 200 (56.8%) at T1. Participants' mean age at T0 was 20.04 (standard deviation = 1.39) years.

No statistically significant differences were found for gender distribution [$\chi^2[3] = 1.06, p = .787$] and age across the cohorts at T0 [F

(3534) = 2.492, $p = .183$]. Medical students from the four consecutive academic years did not exhibit significant differences in scoring on PPOS-8-IT dimensions at T0 [Caring: $F(3534) = 2.249, p = .082$; Sharing: $F(3534) = 2.358, p = .093$]. No statistically significant differences in PC scoring at T0 between students who completed both assessments (T0 and T1) and those who completed only T0 assessment [Caring: $t(536) = 1.703, p = .089$; Sharing: $t(536) = -.062, p = .951$].

3.2. Distribution of patient-centeredness

Mean scores and modes of PPOS-8-IT items at T0 and T1 are reported in Table 2. Caring was greater than Sharing both at T0 (Caring = $4.71 \pm .71$ vs Sharing = $3.35 \pm .85$) and T1 (Caring = $4.68 \pm .69$ vs Sharing = $3.45 \pm .79$). The lowest mean scores and modes were obtained by items 3 and 7 (Sharing). These items obtained the lowest rates across the tool in both assessments.

3.3. Longitudinal changes in patient-centeredness

As reported in Table 3, no statistically significant changes between T0 and T1 in Caring attitude were found. Differently, a statistically significant change in Sharing scores between T0 and T1 occurred. At T1, students reported higher scores on Sharing. There was not a statistically significant interaction between gender and year of study on Sharing change [$F(1334) < 2.673, p > .123$] which means that the pattern of change in Sharing for female students was similar to that of male students. Pre-post PPOS-8-IT Sharing differences had a small effect size.

When focusing on the quartile distributions in PPOS-8-IT subscales at T0, different and significant trends emerged in Q4 and Q1 for the Caring subscale and Q4, Q3, and Q1 for the Sharing subscale. For the Caring subscale, students in the lower bound (Q4) at T0 presented a statistically significant increase at T1, whereas students scoring higher at T0 (Q1) showed a statistically significant decrease at T1. As for the Sharing subscale, a similar trend was observed. Students scoring lower at T0 (Q4 and Q3) showed a statistically significant increase at T1, while

Table 2
Scores on PPOS-8-IT items in year 2 (T0) and year 5 (T1).

	T0 (N = 538)		T1 (N = 352)	
	Mean (SD)	Mode	Mean (SD)	Mode
1. The doctor is the one who should decide what gets talked about during a visit. (S)	4.15 (1.24)	5	3.70 (1.23)	5
2. The most important part of the standard medical visit is the physical exam. (C)	3.67 (1.17)	3	3.71 (1.27)	4
3. Patients should rely on their doctors' knowledge and not try to find out about their conditions on their own. (S)	2.80 (1.41)	2	3.21 (1.45)	2
4. If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important. (C)	5.21 (1.12)	6	5.38 (.89)	6
5. The patient must always be aware that the doctor is in charge. (S)	4.00 (1.50)	5	4.77 (1.21)	5
6. If a doctor's primary tools are being open and warm, the doctor will not have a lot of success. (C)	4.39 (1.29)	5	4.12 (1.35)	5
7. When patients look up medical information on their own, this usually confuses more than it helps. (S)	2.44 (1.16)	2	2.12 (1.02)	2
8. It is not that important to know a patient's culture and background in order to treat the person's illness. (C)	5.43 (.81)	6	5.50 (.77)	6

Notes. (C) Caring, (S) Sharing; higher mean scores refer to higher levels of disagreement with item content (higher patient-centered orientation)

Table 3 –
Longitudinal change in patient-centeredness scores (PPOS-8-IT) controlled by gender between T0 and T1 (N = 352).

	T0		T1		F	P	η_p^2
	M (SD)		M (SD)				
PPOS-8-IT-C	4.71 (.71)		4.68 (.69)		.710	.400	-
Q4 (1.75–4.24)	3.57 (.44)		4.16 (.64)		43.932	.000	.41
Q3 (4.25–4.74)	4.40 (.12)		4.48 (.67)		1.582	.212	-
Q2 (4.75–5.24)	4.89 (.12)		4.79 (.63)		3.492	.065	-
Q1 (5.25–6)	5.46 (.21)		5.03 (.54)		55.744	.000	.34
PPOS-8-IT-S	3.35 (.85)		3.45 (.79)		4.533	.024	.01
Q4 (1.25–2.74)	2.17 (.34)		3.03 (.72)		84.800	.000	.54
Q3 (2.75–3.374)	3.01 (.20)		3.27 (.79)		11.645	.001	.10
Q2 (3.375–3.99)	3.64 (.13)		3.59 (.75)		.462	.499	-
Q1 (4.00–5.50)	4.39 (.39)		3.85 (.69)		64.567	.000	.41

participants in the upper bound (Q1) at T0 presented a statistically significant decrease at T1.

3.4. Gender differences in patient-centeredness

As shown in Table 4, gender differences in the two administrations were statistically significant for both PPOS-8-IT dimensions with women outscoring men on all PPOS-8-IT scales at both T0 and T1. All differences had a medium effect size.

4. Discussion and conclusion

4.1. Discussion

To the best of our knowledge, this is the first longitudinal study to measure PC in undergraduate Italian medical students. We aimed to establish if and to what extent there were changes in PC throughout medical school while exploring the role of gender in this population. A significant increase in the Sharing attitude between year 2 and year 5 emerged while no significant change was found for the Caring component of PC. Female students, irrespective of their year of study, reported higher PC than their male counterparts. Furthermore, students scoring lower on Sharing did so throughout the medical school period considered.

4.1.1. Patient-centeredness over time

Overall our findings revealed an increase in the Sharing dimension of PC at the end of CLEDU2to5 while the Caring component remained stable over time. The increase found in Sharing scores indicates that students became more patient-centered as their education progressed. This result is in line with existing research [22], but contrasts with others [25,34,44]. The increase of the Sharing attitude and the stability of the Caring attitude could be related to CLEDU2to5 which is particularly focused on doctor-patient communication. It however follows that the Sharing orientation may be more affected by the medical curriculum than the Caring component. This hypothesis should be further explored in future studies.

When focusing on PC changes in particular sub-groups of students based on their PC values at T0, the picture become more nuanced. Two

Table 4
Gender differences in patient-centeredness (PPOS-8-IT) scores in second (T0) and fifth (T1) year of study.

	T0 (N = 538)					T1 (N = 352)				
	Male (N = 250)	Female (N = 288)				Male (N = 152)	Female (N = 200)			
	M (SD)	M (SD)	t	p	D	M (SD)	M (SD)	t	P	d
PPOS-8-IT-C	4.45 (.79)	4.87 (.64)	-6.805	< .001	.58	4.48 (.71)	4.82 (.64)	-4.701	< .001	.50
PPOS-8-IT-S	3.15 (.86)	3.52 (.84)	-4.970	< .001	.44	3.28 (.78)	3.58 (.79)	-3.544	< .001	.38

Notes. PPOS-8-IT-C Caring, PPOS-8-IT-S Sharing

groups with distinct developmental trajectory patterns of Caring were identified. Students with a higher Caring attitude at the beginning of CLEDU2to5 showed a significant reduction in this dimension at the end of CLEDU2to5, whereas an opposite trend emerged for students lower in Caring at the beginning of CLEDU2to5. A similar pattern emerged for the Sharing attitude. Although we caution that these findings could be ascribed to the regression to the mean phenomenon [45], they can ignite new considerations. CLEDU2to5 could have been received differently according to students' initial PC attitudes. The abstract notions and the idealized representations of the doctor-patient relationship that may characterize medical students with higher levels of PC in the early years of study could be curtailed by academic or healthcare environment-related factors such as the hidden curriculum [46,47]. High PC scores at year 2 may reflect an idealized and often unrealistic conceptualization of the medical profession. The lowering in PC scores at year 5 may therefore reflect an adjustment of this initial idealized conceptualization towards a more realistic and mature one as well as the recognition of the fatigue often associated with caring roles in healthcare professions. Furthermore, the decrease in PC in our sub-sample seems to mirror the one found in empathy studies where empathy decreases throughout medical school. This change in empathy has been often ascribed to a sort of “hardening of the heart” process [48] where medical students become immunized against humanistic qualities after their matriculation into medical school [49]. On the other hand, students entering medical school with low PC attitudes may have benefited from CLEDU2to5 and have appreciated the importance of a patient-centered orientation during the following years [50], thus increasing their PC attitudes.

Previous findings emphasize the importance of students' reflections on the hidden curriculum as a resource for improving and humanizing clinical medical education [51]. Furthermore, “exposing” the hidden curriculum through specific and innovative longitudinal activities may prevent the degradation of students' patient-centered attitudes [52,53]. Although PC-focused interventions may temporarily halt the decline in patient-centered beliefs, Trotter et al. [54] advise caution that they might not be enough to completely prevent the erosion of patient-centered beliefs leaving hidden curriculum's influence a challenge to be tackled. Nevertheless, our results indicate that baseline PC can inform us about students' future PC: those exhibiting higher initial scores are more likely to decrease in PC, whereas those exhibiting lower initial scores may increase in PC.

4.1.2. Patient-centeredness distribution and gender differences

Caring was greater than Sharing both at T0 and T1 for both male and female students. This result is aligned with other previous international studies that reported similar patterns among undergraduate medical students [34,39,55]. A possible interpretation of this pattern is that the Caring attitude is more related to one of the strongest drivers for entering medical school, that is, to care of others in need [56]. When looking at the scores of items at T0 and T1, items 3 and 7 – that refer to the respondents' thoughts towards the tendency of patients to find out about their conditions and look up medical information on their own (Sharing subscale) – obtained the lowest scores at both the assessment points. It can be inferred that medical students, regardless of their year of study, struggle to accept that patients can look for information on

their conditions on their own since they consider that this practice usually leads to confusion more than it helps. This data should be made aware to medical educators since previous studies highlighted that if physicians implicitly or explicitly discourage patients to discuss the information they procured, it can lead to patients becoming frustrated and anxious [57–59] and therefore possibly creating barriers to cooperation and share decision making during doctor-patient encounters [60].

PC among Italian male and female medical students in our study were generally comparable to those found in previous studies confirming that gender is a strong predictor of PC [10] with female being associated with greater patient-centered orientation [34,39]. Several studies have reported that female doctors, when compared to their male colleagues, are more likely to talk positively, build partnerships with patients, ask questions, and provide information [61]. People's adherence to the widespread gender stereotype in Western culture which considers it more socially acceptable for females to discuss feelings and emotions can account for our findings [40].

4.1.3. Study Limitations

Our sample is sufficiently representative of Italian medical students at the entrance as the admission test for medical schools is centralized and conducted at a national level therefore the implementation of CLEDU2to5 has the potential to bring the same outcomes at the national level. Although this study involved a large sample of students, data were collected from a single medical school. Despite the structure of Italian medical school programs being similar throughout the country, there are local differences in the amount of ECTS assigned to each discipline and to clinical experience [62]. Milano-Bicocca School of Medicine (Italy) is characterized by early clinical experiences and great attention to communication skills and relational aspects of the patient-doctor relationship. Therefore, the structure of CLEDU2to5 may not be equivalent to that of all other Italian medical schools limiting the generalizability of our findings. Our results and considerations can neither be extended to other countries where the medical curricula, as well as the healthcare settings and culture, may differ in several aspects. To overcome this limitation, future comparisons of the key components of medical school curricula and healthcare environments in the U.S.A., where the majority of the studies on PC are conducted, and other countries are needed to assess the impact of curriculum and cultural features on PC in medical students. The absence of a post-graduate follow-up is a further limitation. Furthermore, the inclusion of an observational assessment of PC (e.g., simulated or real patients with external raters) could improve the ecological validity of future investigations. It could be also advisable to include more assessment points along CLEDU2to5 (or enlarge the academic period considered) to further capture the contribution of each formal and structured formative activity in promoting PC growth.

4.2. Conclusion

This longitudinal study showed that, compared to year 2, medical students in year 5 reported a moderately higher PC Sharing attitude beyond the effect of gender, whereas no significant changes were reported for the Caring component of PC. Groups with distinct developmental trajectory patterns of both Sharing and Caring were identified. Students with high levels of Sharing or Caring in year 2 reported significantly lower scores in year 5 while students with lower scores in year 2 significantly increased from first to the last measurement. These findings call for further research to shed light on the nature of these results and to identify the effect of formal teaching activities and that of the broader medical culture and individual psycho-attitudinal factors on students' PC.

4.3. Practice implications

Our findings can inform medical educators and administrators when designing educational programs to sustain their students' PC. Our data

ask for including the assessment and monitoring of PC in medical students throughout their medical education to support tailored education programs and interventions. The assessment of the PC at the beginning of medical school and its monitoring throughout the studies may be crucial for identifying students with initial biased patient-/doctor-centered orientation in order to support them to adapt this orientation to the healthcare environment's requests.

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CRediT authorship contribution statement

Stefano Ardenghi: Conceptualization, Methodology, Investigation, Formal analysis, Data Curation, Visualization, Writing - Original Draft, Writing - Review & Editing. **Selena Russo:** Conceptualization, Methodology, Writing - Review & Editing. **Giulia Rampoldi:** Conceptualization, Methodology, Writing - Review & Editing. **Marco Bani:** Conceptualization, Methodology, Writing - Review & Editing. **Maria Grazia Strepparava:** Conceptualization, Methodology, Writing - Review & Editing, Supervision, Resources, Project administration.

Declaration of Competing Interest

None.

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