



Original article

Communication skills in medical students – An exploratory study before and after clerkships



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ABSTRACT

Introduction: Effective communication is the cornerstone of a fruitful patient–physician relationship. Teaching clinical communication has become a pivotal goal in medical education. However, approaches measuring the maintenance of learned skills are needed since a decline in some communication skills during medical school has been reported.

Objective: Explore medical students' communication skills in a simulated clinical encounter before and after clerkships.

Methods: Two-hundred-fifty-five undergraduate students attending the second year of medical course, at the Faculty of Medicine of University of Porto, completed a 1.5-h per week course over 4 months on basic communication skills. The students' final evaluation consisted in an interview with a simulated patient, assessed by a teacher using a standardized framework. Three years later, while attending clerkships, 68 students from the same population completed a re-evaluation interview following the same procedure.

Results: Medical students maintained a communication skill mean level similar to that of the original post-training evaluation, but significant differences in specific communication abilities were detected in this group of students. Empathic attitudes and ability to collect information improved whereas interview structure and non-verbal behavior showed a decline during clerkships expressing a balance between the competencies that improved, those that declined, and those that remained unchanged.

Conclusion: Present findings emphasize the importance of patient contact, context and clinical role models on the maintenance of learned skills, underscoring the importance of an integrated approach of clinical communication teaching throughout medical school.

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Introduction

Effective communication is the cornerstone of patient-centered medicine and empathic behavior, leading to a fruitful patient–physician relationship. It contributes to a positive therapeutic effect and better patient outcomes and satisfaction, thus increasing the overall quality of health care systems.^{1–4} Proficient physician communication is identically associated with professional satisfaction, accomplishment, and confidence.^{5,6}

Teaching the why and how of clinical communication has then become a pivotal goal in medical education, gradually included in undergraduate curricula as a means to enhance the ability to collect relevant information, build strong therapeutic relationships, and foster patient care.^{5,7,8}

Experience shows that medical students are attentive, motivated and avidly develop clinical communication skills (CCS) in concert with other medical skills.^{9–11} Problem-oriented CCS are reported to be easier to teach and learn than empathy or respect, as these require a strong influence of innate emotional and cultural sources.¹² Even so, empathy can be taught and improved.^{13,14}

The most suitable and effective time during the medical course to learn CCS is still a matter of debate, with some authors stating that a longitudinal design covering several years could be the more effective.^{39–41} Students also believe that it is important to learn communication strategies throughout the medical course by integrating them into clinical practice.⁴²

Abbreviations: CCS, clinical communication skills; SEGUESet the Stage, Elicit information, Give information, Understand the patient's perspective, End the encounter, checklist; T1, first evaluation in 2008; T2, second evaluation in 2012.

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Currently, training programs applied during medical courses have been shown to improve students' knowledge,^{43–45} attitudes,^{46,47} confidence,^{48,49} empathy,^{50–52} patient-centeredness,^{48,49} and interview structure^{12,44,53,54} and also promote patient satisfaction.^{48,55,56}

Gender has been described to influence CCS acquisition in medical students. Female students were found to be more patient-centered,^{48,57} to have more positive attitudes toward CCS training,^{8,11,12,58} to be more empathic^{59–66} and to be more prone to develop interpersonal relationships.^{61,67} Male students were described to have less positive attitudes toward CCS learning,^{9,11} to be more confident^{68,69} and to frequently adopt attitudes of dominance and independence.⁷⁰

Assessment of students' communication skills

The objective assessment of a student's ability to communicate with patients has also gathered emergent attention.³¹ Methods to assess the level of “knows” (remembering the skill) and/or “knows how” (applying the skill) of communication can be divided into: video presentations with oral, essay, or multiple-choice exam questions⁷¹ and peer and/or self-assessment of communication skills^{45,72,73}; checklists filled by observers of students' performances during real or simulated patient encounters; surveys of real or simulated patient experience in clinical interactions. Clinical encounters with simulated patients trained to follow standardized scenarios are presently widely used.⁷⁴ These interviews provide an objective assessment with high validity and reliability, permitting to evaluate how students objectively “do”³¹ and to obtain the patient's perspective of how efficiently they perform. The same tools have failed to gather a strong consensus regarding empathy.^{75–77} The cognitive and behavioral dimensions of empathy were found to be more easily validated (e.g., listening carefully and acting accordingly) during a simulated interview than the emotional dimension (e.g., address and respond to emotions).⁷⁸

Communication skills through clerkships

Periodic assessment of retention and application of CCS is of utmost importance to confirm the effectiveness in communicating with patients and the persistence of learned abilities. A decline of CCS during clerkships in undergraduate medical students has been reported, namely in empathy,^{72,79,80} patient-centered attitudes,⁵⁷ process-oriented skills,^{81,82} and attitudes toward the doctor–patient relationship.^{83,84} Regarding empathy, however, it has recently been argued that the suggested decline among medical students is “greatly exaggerated” because of methodological shortcomings.⁸⁵ Adding to this dispute, various cross-sectional studies^{61,63,65,86–88} and two longitudinal studies^{62,66} on self-reported empathy also showed an increase or no significant variation in empathy during the medical course. CCS learned in the first years of undergraduate medical education can, in fact, be challenged during clinical practice when students are confronted with time constraints, demanding contexts, role models with different communication styles, and real patients.^{20,89–91} Other factors reported to influence skill retention are: students' attitudes toward communication skills training and value of clinical communication skills; experience within the clinical setting; specialty preferences; and demographic variables, such as gender and cultural background.^{48,96–98} Interacting with real patients is also thought to reinforce the students ability to communicate accurately.⁹⁹ The decline in specific communication abilities can be associated with the lack of articulation of pre-clinical and clinical curricula and the learning context in clinical practice: higher demand of medical training; cultural or organizational influences; marked variability among tutors regarding communication skills;

and the gap between academic and clinical role models.^{72,91,100–103} Role-modeling by clinical teachers has been pointed to by students as the most powerful influence on empathy development.^{104,105} Negative attitudes from clinical faculty and residents,¹⁰³ an intimidating educational environment, perception of brittleness, overly demanding educational assignments and patient negativity were reasons proposed to contribute to the decline in empathy during the medical course.¹⁰⁶

Our aim was to study how medical students communicate before and after clerkships in a simulated clinical encounter. As secondary aims we intended to: (i) explore students perspective on communication skills relevance and changes during medical school and (ii) identify specific needs in order to refine communication skills teaching.

Methods

The present study follows an observational longitudinal design.

The medical course at the Faculty of Medicine of the University of Porto runs a six-year undergraduate program divided into pre-clinical years (years 1–3) and clinical clerkships (years 4–6). During the first three years, students have a small clinical experience and a few opportunities to interact with patients. Inversely, during clerkships, they interact with patients within a clinical environment, largely hospital-based, under clinician supervision. Communication skills and the doctor–patient relationship are studied in the second year, including the acquisition of a theoretical background and practical training. Training is based on experiential techniques (role-playing, and videotaped simulated clinical situations) used to establish experience and reflect on communication abilities. The final evaluation consists of a clinical encounter with a trained actor as a simulated patient, which is assessed by teachers using an adapted version of the checklist of medical communication tasks: Set the Stage, Elicit information, Give information, Understand the patient's perspective, End the encounter (SEGUE).⁷⁵

Participants

A convenience sample of 68 students from a pool of 255 students was recruited for the present study, based on a sample size calculation assuming a standard deviation of 4 and a mean difference of 2 between T1 and T2¹¹¹ (alpha level of 0.05 and a power of 80%). The participants were invited to participate using a snowball approach (phone call, in-person or email contact). Sixty-nine students were contacted and 68 accepted to participate. The inclusion criterion was willingness to participate. No exclusion criteria were applied.

Instruments

The SEGUE framework⁷⁵ was translated and adapted to meet the assessment needs of the teaching program and to discriminate students performance. This adapted version contains 20 items divided into 4 content areas (Set the stage; Elicit information; Understand the patient's perspective; and End the encounter). Items are rated as: 2 for excellent performance; 1 for average performance; 0 for absent performance; –1 for inadequate performance; and –2 directedness or disrespectful tone. This scoring corresponds to the pedagogical outcomes of the course and results from a consensus of communication skills teachers established and in use since 2007. The final score is achieved by the sum of all items. The maximum score is 28 and the minimum is –11. A detailed description of the scale is presented in [Table 1](#).

An original questionnaire was built in order to characterize students demographic (age, gender) and academic profile and to define

Table 1
Score range for each item of the adapted version of SEGUE framework.

SEGUE items	Rating
<i>Set the stage</i>	
1. Maintain patient privacy	-1, 0, 1
2. Greet patient appropriately	0, 1
3. Make a personal connection during visit (e.g., go beyond medical issues)	0, 2
4. Establish reason for visit (e.g., start with an open question)	0, 1
5. Outline agenda for visit (e.g., "anything else?", issues, sequence)	0, 1, 2
<i>Elicit information</i>	
6. Elicit patient's view of the health problem and/or progress (ideas, concerns)	-1, 0, 1, 2
7. Explore physical/physiological factors (signs, symptoms)	0, 1, 2
8. Explore psychosocial/emotional factors (e.g., living situation, family relations, stress)	-1, 0, 1, 2
9. Discuss antecedent treatments (e.g., self-care, last visit, other care)	0, 1
10. Discuss how the health problem affects patient's life (e.g., quality of life)	-1, 0, 1, 2
11. Discuss lifestyle issues/prevention strategies (e.g., health risks)	0, 1
12. Avoid directive/leading questions	-2, -1, 0
13. Give patient opportunity/time to talk (e.g., do not interrupt)	-1, 0, 1
14. Listen. Give patient undivided attention (e.g., face patient, verbal acknowledgment, non-verbal feedback)	-1, 0, 1, 2
15. Check/clarify information (e.g., recapitulation, ask "how much")	-1, 0, 1, 2
<i>End the encounter</i>	
16. Ask if there is anything else patient would like to discuss	0, 1
17. Greet appropriately	0, 1
<i>Understand the patient's perspective</i>	
18. Acknowledge patient's accomplishments/progress/challenges	0, 2
19. Express caring, concern, empathy	0, 1, 2
20. Maintain a respectful tone	-2, -1, 0

clinical areas of interest. Attitudes and expectations of the students regarding the role of CCS in the clinical setting and their perceived performances in communicating with patients during clerkships were also evaluated. A 5-point Likert scale ranging from "Strongly disagree" to "Strongly agree" was used to rate: clinical communication patterns observed in clinical practice versus the curricular

training program, specific suggestions from clinicians, perceived changes in learned competences, and expectation of communication skills usefulness in clinical practice.

Procedures/data collection

All students of our sample performed a clinical encounter (T2) similar to the final evaluation of the communication skills course (T1), assessed by a trained teacher. This rater participated also at the T1 evaluation. Two actors (one male and the other female) with accredited academic education in social sciences and experience as simulated patients voluntarily agreed to collaborate. The simulated situations and patients were randomly chosen.

The researchers were blind for students T1 score. The interview rater and collector of other data were blind for each other's evaluation. Evaluation procedures are detailed in Fig. 1.

Statistical methods

SPSS Statistics (version 20) was used for statistical analysis. Descriptive statistics, means, and standard deviations were calculated for the demographic, academic, and SEGUE results. Chi-square test, Kruskal-Wallis, independent, and paired-samples *t*-tests were also used to detect statistically significant differences between groups. Significance value *p* for follow-up differences on SEGUE items was set at 0.0025 according to Bonferroni correction, in order to minimize the family-wise error rate of multiple measurements.

Ethical approval was granted by the Ethical Committee from São João Hospital EPE. Participants were informed about the study and methods and confidentiality was ensured. All participants signed a written informed consent according to the Declaration of Helsinki for human research ethics.

Results

Socio-demographic and academic characteristics

Mean age of participants was 22.7 years (SD 0.63). Twenty-six were males (38.2%) and 42 were females (61.8%). All students had joined medical school in the same year. Academic performance,

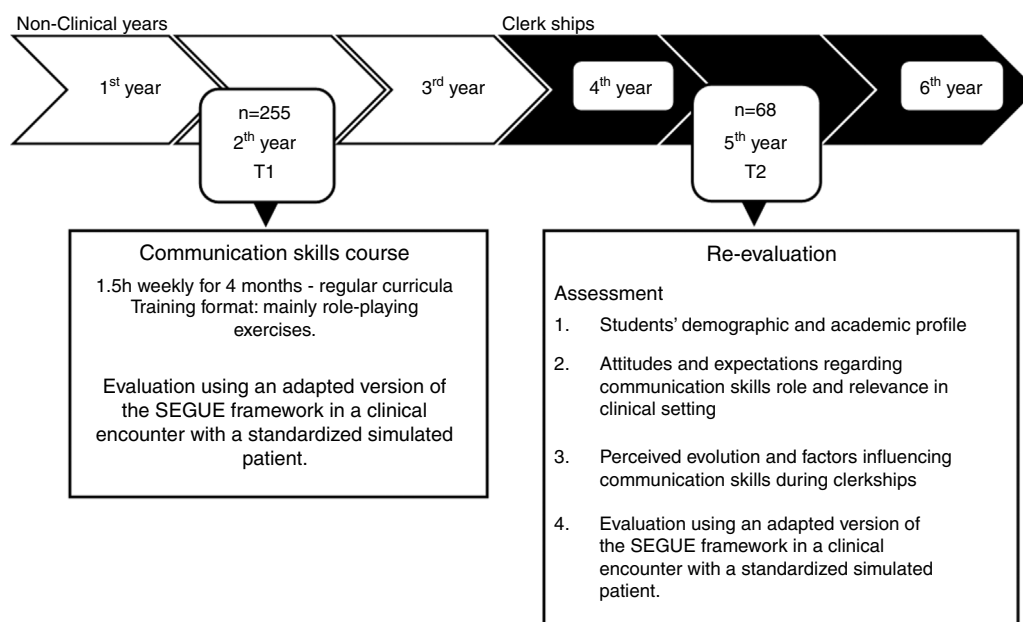


Fig. 1. Curriculum structure and the re-evaluation protocol.

- Set the stage
1. Maintain patient privacy
 - * 2. Greet patient appropriately
 3. Make a personal connection during visit
 4. Establish reason for visit
 - * 5. Outline agenda for visit
- Elicit information
6. Elicit patient view of the health problem and/or progress
 7. Explore physical/physiological factors
 - * 8. Explore psychosocial/emotional factors
 9. Discuss antecedent treatments
 10. Discuss how the health problem affects patient's life
 - * 11. Discuss lifestyle issues/prevention strategies
 12. Avoid directive/leading questions
 13. Give patient opportunity/time to talk
 - * 14. Listen. Give patient undivided attention
 15. Check/clarify information
- End the encounter
16. Ask if there is anything else patient would like to discuss
 - * 17. Greet appropriately
- Understand the patient's perspective
18. Acknowledge patient accomplishments/progress/challenges
 - * 19. Express caring, concern, empathy
 20. Maintain a respectful tone

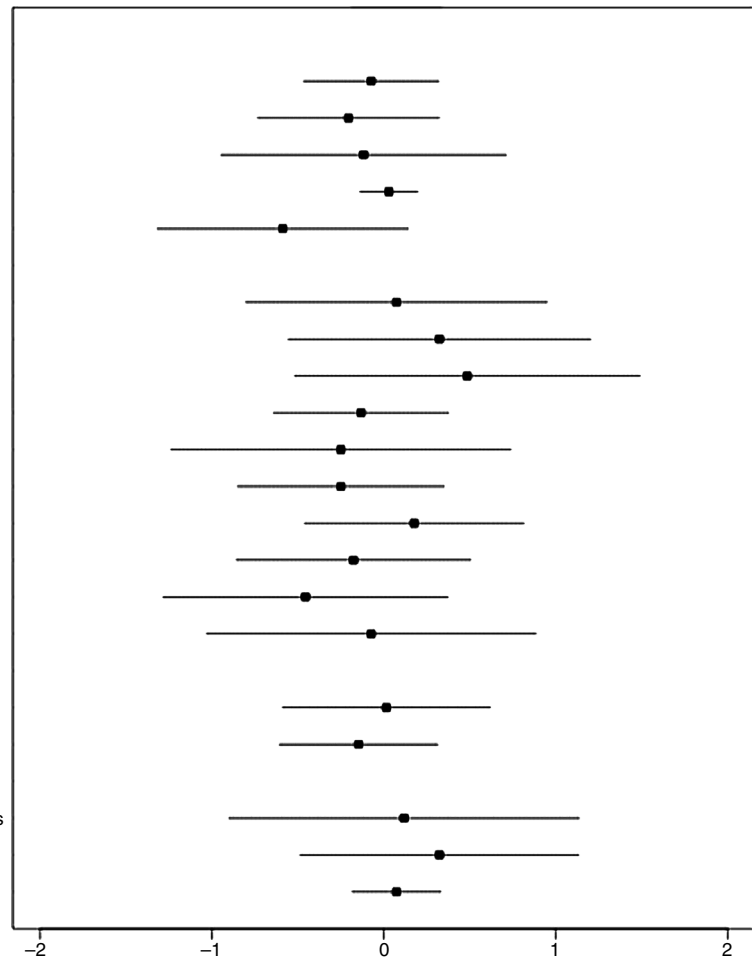


Fig. 2. Differences between mean values per item between T1 and T2 evaluations. * $p < 0.0025$ (paired samples t -test).

measured by average course grade, varied between 12.0 and 17.5 in a 20 values range, with a mean result of 14.2 values. Fifty-six students presented "Clinical practice" as their main interest in coming to medicine; 1 indicated "Research"; 6 indicated both reasons; and 5 joined the medical course mainly for research reasons but presently showed clinical practice as their principal interest.

Communication skills assessment before (T1) and after clerkships (T2)

Similar results ($p = 0.178$) were obtained in SEGUE framework in the T1 (15.5 SD 4.3) and T2 (14.7 SD 3.9). Detailed analyses revealed statistically significant differences between the two evaluations. The mean score of the items "Explore psychosocial/emotional factors" ($p < 0.001$) and "Express caring, concern, empathy" ($p = 0.002$) were significantly higher in T2. On the contrary, the items "Greet patient appropriately at the beginning of the encounter" ($p = 0.002$), "Outline agenda for visit" ($p < 0.001$), "Discuss lifestyle and prevention strategies" ($p = 0.001$), and "Active listening (undivided attention)" ($p < 0.001$) presented statistically significant lower scores at re-evaluation (see Fig. 2 and Table 2). No gender differences were detected in the SEGUE total mean score and item analysis at T1 and T2 (data not shown).

Students' perspective on clinical communication (Table 3)

The majority of the students stated that doctor-patient communication "is important" ($n = 68$, 100%), "affects doctor's

Table 2

Follow-up differences on communication skills performance (T1–T2).

	T1 – total $n = 68$	T2 – total $n = 68$	p
SEGUE total score ^a	15.54 (4.32)	14.66 (3.89)	0.178 ^b
<i>Set the stage</i> ^a			
Item 1 – Maintain privacy	0.97 (0.24)	0.90 (0.31)	0.133 ^b
Item 2 – Greet patient appropriately	0.91 (0.29)	0.71 (0.46)	0.002 ^b
Item 3 – Make personal connection	0.29 (0.71)	0.18 (0.57)	0.251 ^b
Item 4 – Establish reason(s) for visit	0.97 (0.17)	1.00 (0.00)	0.159 ^b
Item 5 – Outline agenda for visit	1.40 (0.55)	0.81 (0.55)	0.000 ^b
<i>Elicit information</i> ^a			
Item 6 – Elicit patient's view	0.76 (0.69)	0.84 (0.66)	0.469 ^b
Item 7 – Explore physical factors	1.28 (0.64)	1.60 (0.65)	0.004 ^b
Item 8 – Explore emotional factors	0.72 (0.71)	1.21 (0.84)	0.000 ^b
Item 9 – Discuss prior treatments	0.93 (0.26)	0.79 (0.41)	0.038 ^b
Item 10 – Discuss impact of problems	0.97 (0.52)	0.72 (0.83)	0.043 ^b
Item 11 – Discuss lifestyle strategies	0.85 (0.36)	0.60 (0.49)	0.001 ^b
Item 12 – Avoid directive questions	-0.32 (0.61)	-0.15 (0.36)	0.027 ^b
Item 13 – Active listening (opportunity)	0.82 (0.42)	0.65 (0.57)	0.039 ^b
Item 14 – Active listening (attention)	1.25 (0.61)	0.79 (0.61)	0.000 ^b
Item 15 – Check/clarify information	1.01 (0.72)	0.94 (0.67)	0.533 ^b
<i>End the encounter</i> ^a			
Item 16 – Elicit patient's last questions	0.65 (0.48)	0.66 (0.48)	0.843 ^b
Item 17 – Greet appropriately	0.90 (0.31)	0.75 (0.44)	0.011 ^b
<i>Understand patient's perspective</i> ^a			
Item 18 – Acknowledge strengths	0.21 (0.61)	0.32 (0.74)	0.350 ^b
Item 19 – Express caring, empathy	1.01 (0.64)	1.34 (0.66)	0.002 ^b
Item 20 – Maintain a respectful tone	-0.07 (0.26)	0.00 (0.00)	0.024 ^b

^a Mean (standard deviation).

^b Paired-samples t -test with p set at 0.0025 according to Bonferroni correction.

Table 3
Students' general perspective on clinical communication.

	Total n = 68	Men n = 26 (38.2)	Women n = 42 (61.8)	
"Is important" ^a				NA
Yes	68 (100)	26 (100)	42 (100)	
"Affects Doctor's efficacy/competence" ^a				NA
Yes	67 (98.5)	25 (96.2)	42 (100)	
Neutral	1 (1.5)	1 (3.8)	0 (0.0)	
"Affects professional satisfaction" ^a				NA
Yes	65 (95.6)	25 (96.2)	40 (95.2)	
No	1 (1.5)	0 (0.0)	1 (2.4)	
Neutral	2 (2.9)	1 (3.8)	1 (2.4)	
"Must be objective, focused on principal ^b matter"				0.437 ^b
Yes	32 (47.1)	13 (50.0)	19 (45.5)	
No	16 (23.5)	4 (15.4)	12 (28.6)	
Neutral	20 (29.6)	9 (34.6)	11 (26.2)	
"Importance depends on physical context" ^a				0.073 ^c
Yes	29 (42.6)	15 (57.7)	14 (33.3)	
No	27 (39.7)	6 (23.0)	21 (50.0)	
Neutral	12 (17.6)	5 (19.2)	7 (16.7)	
"Quality depends on physical context" ^a				0.413 ^d
Yes	49 (72.0)	21 (80.8)	28 (66.7)	
No	13 (19.1)	3 (11.5)	10 (23.8)	
Neutral	6 (8.8)	2 (7.7)	4 (9.5)	

NA – not applicable.

^a n (%).^b Chi-square test ($X^2 = 1.652$, $df = 2$, $p = 0.437$).^c Chi-square test ($X^2 = 5.226$, $df = 2$, $p = 0.073$).^d Chi-square test ($X^2 = 1.769$, $df = 2$, $p = 0.413$).

efficacy/competence" ($n = 67$, 98.5%), and "affects professional satisfaction" ($n = 65$, 95.6%). Concerning the question if communication "Must be objective, focused on principal complaint," 32 (47.1%) answered positively, 16 (23.5%) disagreed, and 20 (29.4%) had no opinion. Approximately half of the participants declared that communication skills relevance and quality depends on the physical context of doctor–patient interaction (whether the situation occurs in an emergency room, infirmary, or physicians office). No statistically significant gender differences were found (see Table 3).

Students' evaluation of changes in communication skills before and after clerkships (Table 4)

Students stated that learning communication skills was important to their clinical practice ($n = 46$, 67.6%) and approximately half say they apply what they have learned ($n = 35$, 51.5%). However, students report that physicians they work with use different communication strategies ($n = 46$, 70.8%). Clinical context was considered to influence the communicational approach ($n = 45$, 66.1%). From the 58 (85.3%) students who considered their communication skills to have changed over the last years, 27 (46.5%) presently believe they can better communicate with patients, 13 (22.4%) feel that their communication skills declined with clinical practice, and 18 (31.0%) say that their clinical experience has strengthened some skills and weakened others. The main reasons for a positive change were: clinical experience; scientific knowledge; and confidence in communicating with patients and for a negative change were: lack of time; role models with different communication patterns; complex real patients; and complex real context. Almost all students ($n = 63$, 92.6%) noticed that doctors use different ways to communicate according to their clinical area. Regarding future clinical practice, this group of students seems to prefer medical ($n = 30$, 44.1%) or medico-surgical ($n = 19$, 27.9%) areas. No statistically significant gender differences were found (see Table 4).

Table 4
Students' evaluation of their communication skills changes.

	Total n = 68	Men n = 26 (38.2)	Women n = 42 (61.8)	p
"What I have learned was important and useful to start my clinical practice" ^a				0.204 ^b
Yes	46 (69.6)	19 (73.1)	27 (64.3)	
No	3 (4.4)	0 (0.0)	3 (7.1)	
Neutral	16 (23.5)	3 (26.9)	9 (21.4)	
Missing	3 (4.4)	0 (0.0)	3 (7.1)	
"I observed in other doctors what I had been taught" ^a				0.289 ^c
Yes	19 (27.0)	10 (38.5)	9 (21.4)	
No	23 (33.8)	8 (30.8)	15 (35.7)	
Neutral	23 (33.8)	8 (30.8)	15 (35.7)	
Missing	3 (4.4)	0 (0.0)	3 (7.1)	
"It was suggested to change my attitude" ^a				0.259 ^d
Yes	16 (23.5)	8 (30.8)	8 (19.0)	
No	37 (54.5)	12 (46.2)	25 (59.5)	
Neutral	12 (17.6)	6 (23.1)	6 (14.3)	
Missing	3 (4.4)	0 (0.0)	3 (7.1)	
"I apply daily what I have learned" ^a				0.493 ^e
Yes	35 (51.5)	14 (53.8)	21 (50.0)	
No	8 (11.7)	4 (15.4)	4 (9.5)	
Neutral	22 (32.4)	8 (30.8)	14 (33.3)	
Missing	3 (4.4)	0 (0.0)	3 (7.1)	
"I appreciate more what I observe in clinical ^a practice"				0.762 ^f
Yes	45 (66.1)	17 (65.4)	28 (66.6)	
No	6 (8.9)	2 (7.7)	4 (9.5)	
Neutral	13 (19.1)	6 (23.0)	7 (16.6)	
Missing	4 (5.9)	1 (3.8)	3 (7.1)	
"Doctors have different ways to communicate according to their clinical area" ^a				0.165 ^g
Yes	63 (92.6)	24 (92.3)	39 (92.9)	
No	1 (1.5)	1 (3.8)	0 (0.0)	
Neutral	1 (1.5)	1 (3.8)	0 (0.0)	
Missing	3 (4.4)	0 (0.0)	3 (7.1)	
"I feel my communication skills have changed over the last years" ^a				0.256 ^h
Yes				
Positively	27 (39.7)	10 (38.5)	17 (40.5)	
Negatively	13 (19.1)	5 (19.2)	8 (19.0)	
In both directions	18 (26.5)	6 (23.1)	12 (28.6)	
No	7 (10.3)	5 (19.2)	2 (4.8)	
Missing	3 (4.4)	0 (0.0)	3 (7.1)	

NA – not applicable.

^a n (%).^b Chi-square test ($X^2 = 4.590$, $df = 3$, $p = 0.204$).^c Chi-square test ($X^2 = 3.757$, $df = 3$, $p = 0.289$).^d Chi-square test ($X^2 = 4.026$, $df = 3$, $p = 0.259$).^e Chi-square test ($X^2 = 2.405$, $df = 3$, $p = 0.493$).^f Chi-square test ($X^2 = 1.164$, $df = 3$, $p = 0.762$).^g Chi-square test ($X^2 = 5.088$, $df = 3$, $p = 0.165$).^h Chi-square test ($X^2 = 5.323$, $df = 4$, $p = 0.256$).

Discussion and conclusion

Discussion

Communication skills assessment before (T1) and after (T2) clerkships

Conflicting results have been reported regarding the changes in learned communication skills during undergraduate medical education.^{79,81,82,99,107} A reduction in empathy and process-oriented skills has been referred.^{79,81,82} Others, however, reported that communication skills persist until the last years of the medical course, particularly when experiential training is used as a didactic technique.⁹⁹

In the present study, a complex pattern regarding the changes in different communication skills was detected. In fact, a number of strategies learned earlier were reinforced with students' clinical

practice, while others showed a significant decline. Interestingly, empathy and ability to gather relevant psychosocial information enhanced after clerkships which is in-line with those who disagree with the “disturbing” conclusion that empathy declines during medical school.^{66,85} We could speculate that the improvement of empathy in our sample could be related to: the greater clinical experience reported by students that can contribute to a more empathic behavior; a culture influence previously reported in Portuguese students^{63,66}; and contact with empathic role models during clerkships.

A decline was found on some items of interview structure, namely “Outline agenda for visit,” discussion with the patient such as “Discuss lifestyle strategies,” and non-verbal behavior such as “Active listening/giving undivided attention”. Interestingly, a recent follow-up study about the effect of a training program on students’ communication skills found that technical skills (e.g., “greet patients,” “outline agenda”) were easier to learn than other skills.¹² Considering that a decline in these abilities was observed, this could highlight that skills learned early in a medical course can be forgotten if not applied and practiced⁸² and reinforce the importance of integrating communication skills programs throughout medical school.^{42,120}

Students maintained a high ability to protect privacy and establish the reason for the visit. However, attention must be made to the fact that some competencies, such as “Make a personal connection with the patient,” “Elicit patient’s view,” “Check/clarify information,” and “Elicit patient’s last questions” maintained a similar low score at re-evaluation. This finding points to the difficulty in the acquisition and improvement of these specific abilities, as they seem to be less prone to be acquired after the communication skills training program and also not exercised or amplified during clerkships.

In our study, females showed a tendency for better performance in T1 (immediately after the communication skills curricular program) than males. We may hypothesize that this tendency reflects females more rigorous preparation for the final examination (simulated clinical encounter), since at the second evaluation, a similar total SEGUE score and a similar performance on SEGUE items were found in males and females. Females are stated to be more susceptible to social desirability and exigencies of studying.¹¹⁹ This finding is in-line with previous research stating that female students improve their communication skills the most after training, achieve higher grades in clinical communication tasks¹¹⁸ and have different attitudes toward learning communication skills.^{11,83} Interestingly, similar empathic ability was detected in males and females both at T1 and T2. These findings are in disagreement with previous research which reported gender differences in acquiring and maintaining communication skills in clinicians and medical students.^{98,116–118}

Students’ perspective on clinical communication and changes in communication skills before and after clerkships

Students acknowledged the importance of CCS teaching and training prior to starting their clinical practice, in agreement with other authors.^{8,42,115} Moreover, students stating that they “apply daily what they have learned” also strengthen the importance of the training program.

Medical students are reported to be attentive and motivated to learn and train clinical communication strategies.^{11,58} Communication skills learned early in medical courses have proved to enhance students’ abilities to appropriately relate to and communicate with patients during clerkships.⁵ All the students included in the present study attended a CCS course integrated in the regular curricula. As explained, this training program is practice-based and experiential in order to facilitate skill acquisition and the observation and feedback of peers and teachers.^{21,113} Students

showed their ability to adequately communicate with a simulated patient in a standardized scenario objectively evaluated. Students scored best on process-oriented items than on more empathic ones such as “Make a personal connection with patient,” “Elicit patient’s view,” “Explore emotional factors,” “Discuss impact of problems,” “Acknowledge strengths,” or “Express caring, empathy.” These findings are in agreement with the previously reported findings that technical skills are easier to learn and score better after interventions.¹²

Reports on medical students’ awareness of the relevance of doctor-patient communication as a core professional skill¹⁰² underline the importance of communication skills training programs in medical schools. Accordingly, in the present study, the majority of the students agreed that “clinical communication is important and affects doctors’ competence and satisfaction.” However, participants perceived that physical and clinical context could compromise the quality of clinical communication. Time pressure, for example, can influence communicational style; if a lack of time exists, a more straight-to-the-problem communication pattern develops.⁴¹ Furthermore, students in our sample stated that “clinical communication must be objective, focused on principal complaint,” probably reflecting a concern with the demanding context of daily clinical practice. The experience of lack of time in clinical settings could also explain students’ lower scores in items such as “discuss lifestyle/prevention strategies” and particularly the decline in their abilities to give patients time and opportunity to express them.

In specific physical contexts (emergency room, infirmary), relevant communication strategies and, consequently, doctor-patient interaction can be compromised.¹¹² This could explain why students learning in those environments may lose some skills in greeting patients appropriately and paying them undivided attention, which is in-line with their statement that the importance of communication skills depends on the physical context. Present findings underscore the weight of context on the applicability of learned skills.^{91,106}

Our study has several limitations. Although the sample size is statistically acceptable and sample characteristics at T2 are similar to the T1 sample regarding gender and academic performance (data not shown), the recruitment method reduces the generalizability of our findings. Because a convenience sample was used students who agreed to participate could be particularly sensitive to the study topic and thus we cannot exclude a selection bias. Also the T1 evaluation was performed by several raters, but only one of them performed the T2 evaluation. We do not consider this to be an important limitation insofar the raters had similar training and experience in using the SEGUE framework for this purpose.

Conclusion

This study used similar conditions regarding interview setting, format, and evaluation in order to compare students performance. The longitudinal design allows characterization of the changes in acquired CCS. The objective evaluation with a standardized instrument of communicational ability allowed to overcome the limitations of subjective self-reports.

This group of students was aware of the importance of clinical communication as a core medical skill and valued the importance of the pre-clerkship communication skills training program. In the years thereafter, students started their clinical practice under the supervision of different clinicians and faced challenges to the previously learned competencies: lack of time; different role models; complex real patients; and complex real context. On the other hand, they reported that clinical experience, higher scientific knowledge,

and higher self-confidence contributed to better communicate with patients.

Although students maintained their abilities to communicate similarly to post-training evaluation at second year, a complex pattern regarding the changes in different competencies was detected, suggesting a balance between maintenance, improvement, and decline of CCS. No significant gender differences were found on global communication skills performance in the two evaluations of this cohort assessment.

Practice implications

The analysis of which strategies declined, remained steady, and improved during clerkships contributes to refining teaching and training strategies. Present results point to the need to enlarge communication skills teaching and training during clerkships, as some strategies are prone to decline if not applied and practiced in clinical contexts: “Using a helical approach, students can apply the core communication skills learned previously to the new contexts and specialties in which they are learning, while at the same time developing new and advanced skills.”¹²³

Future studies using clinical encounters with real patients are needed in order to permit an evaluation of students communication ability in real contexts.

A baseline evaluation of students before communication skills training would be of interest, making it possible to look for pre-existent factors (personality, gender, socioeconomic status) affecting the acquisition of communication capacities.^{67,70,83,121}

Competing interests

The authors declare that they have no competing interests.

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References

1. Stewart MA. Effective physician–patient communication and health outcomes: a review. *CMAJ*. 1995;152:1423–33.
2. Beck RS, Daughtridge R, Sloane PD. Physician–patient communication in the primary care office: a systematic review. *J Am Board Fam Pract*. 2000;15:25–38.
3. Di Blasi Z, Harkness E, Ernst E, Georgiou A, Kleijnen J. Influence of context effects on health outcomes: a systematic review. *Lancet*. 2001;357:757–62.
4. Street RL, Makoul G, Arora NK, Epstein RM. How does communication heal? Pathways linking clinician–patient communication to health outcomes. *Patient Educ Couns*. 2009;74:295–301.
5. Smith S, Hanson JL, Tewksbury LR, Christy C, Talib NJ, Harris MA, et al. Teaching patient communication skills to medical students: a review of randomized controlled trials. *Eval Health Prof*. 2007;30:3–21.
6. Lewis VO, McLaurin T, Spencer HT, Otsuka NY, Jimenez RL. Communication for all your patients. *Instr Course Lect*. 2012;61:569–80.
7. Shield RR, Tong I, Tomas M, Besdine RW. Teaching communication and compassionate care skills: an innovative curriculum for pre-clerkship medical students. *Med Teach*. 2011;33:e408–16.
8. Koponen J, Pyörälä E, Isotalus P. Comparing three experiential learning methods and their effect on medical students' attitudes to learning communication skills. *Med Teach*. 2012;34:e198–207.
9. Aspegren K. BEME Guide No. 2: teaching and learning communication skills in medicine – a review with quality grading of articles. *Med Teach*. 1999;21:563–70.
10. Maguire P. Key communication skills and how to acquire them. *BMJ*. 2002;325:697–700.
11. Ullah MA, Barman A, Rahim AFA, Yusoff MSB. Determinants of medical student attitudes to a learning communication skills teaching program. *J Mens health*. 2012;1–10.
12. Simmenroth-nayda A, Weiss C, Fischer T, Himmel W. Do communication training programs improve students' communication skills? A follow-up study. *BMC Res Notes*. 2012;5:1.
13. Stewart WM, William JR. Empathy and quality of care. *Br J Gen Pract*. 2002;52.
14. Dereboy C, Harlak H, Gürel S, Gemalmaz A, Eskin M. [Teaching empathy in medical education]. *Turk Psikiyatri Derg*. 2005;16:83–9.
20. Egniew TR, Wilson HJ. Role modeling the doctor–patient relationship in the clinical curriculum. *Fam Med*. 2011;43:99–105.
21. Jackson VA, Back AL. Teaching communication skills using role-play: an experience-based guide for educators. *J Palliat Med*. 2011;14:775–80.
31. Schirmer JM, Mauksch L, Lang F, Marvel MK, Zoppi K, Epstein RM, et al. Assessing communication competence: a review of current tools. *Fam Med*. 2005;37:184–92.
39. Christopher DF, Harte K, George CF. The implementation of tomorrow's doctors. *Med Educ*. 2002;36:282–8.
40. Van Dalen J, Kerkhofs E, van Knippenberg-Van Den Berg BW, van Den Hout HA, Scherpier AJA, van der Vleuten CPM. Longitudinal and concentrated communication skills programmes: two dutch medical schools compared. *Adv Health Sci Educ Theory Pract*. 2002;7:29–40.
41. Malhotra A, Gregory I, Darvill E, Goble E, Pryce-Roberts A, Lundberg K, et al. Mind the gap: learners' perspectives on what they learn in communication compared to how they and others behave in the real world. *Patient Educ Couns*. 2009;76:385–90.
42. Van Weel-Baumgarten E, Bolhuis S, Rosenbaum M, Silverman J. Bridging the gap: how is integrating communication skills with medical content throughout the curriculum valued by students? *Patient Educ Couns*. 2013;90:177–83.
43. Roter DL, Larson S, Shinitzky H, Chernoff R, Serwint JR, Adamo G, et al. Use of an innovative video feedback technique to enhance communication skills training. *Med Educ*. 2004;38:145–57.
44. Van Lengerke T, Kursch A, Lange K. The communication skills course for second year medical students at Hannover Medical School: an evaluation study based on students' self-assessments. *GMS Z Med Ausbild*. 2011;28. Doc54.
45. Tiuraniemi J, Läärä R, Kyrö T, Lindeman S. Medical and psychology students' self-assessed communication skills: a pilot study. *Patient Educ Couns*. 2011;83:152–7.
46. Aper L, Reniers J, Koole S, Valcke M, Derese A. Impact of three alternative consultation training formats on self-efficacy and consultation skills of medical students. *Med Teach*. 2012;34:e500–7.
47. Hausberg MC, Hergert A, Kröger C, Bullinger M, Rose M, Andreas S. Enhancing medical students' communication skills: development and evaluation of an undergraduate training program. *BMC Med Educ*. 2012;12:16.
48. Noble LM, Kubacki A, Martin J, Lloyd M. The effect of professional skills training on patient-centredness and confidence in communicating with patients. *Med Educ*. 2007;41:432–40.
49. Joekes K, Noble LM, Kubacki AM, Potts HWW, Lloyd M. Does the inclusion of “professional development” teaching improve medical students' communication skills? *BMC Med Educ*. 2011;11:41.
50. Fernandez-Olano C, Montoya-Fernandez J, Salinas-Sánchez AS. Impact of clinical interview training on the empathy level of medical students and medical residents. *Med Teach*. 2008;30:322–4.
51. Winefield HR, Chur-Hansen A. Evaluating the outcome of communication skill teaching for entry-level medical students: does knowledge of empathy increase? *Med Educ*. 2000;34:90–4.
52. Ozcan CT, Oflaz F, Bakir B. The effect of a structured empathy course on the students of a medical and a nursing school. *Int Nurs Rev*. 2012;59:532–8.
53. Evans BJ, Stanley RO, Mestrovic R, Rose L. Effects of communication skills training on students' diagnostic efficiency. *Med Educ*. 1991;25:517–26.
54. Yedidia MJ, Gillespie CC, Kachur E, Schwartz MD, Ockene J, Chepaitis AE, et al. Effect of communications training on medical student performance. *JAMA*. 2003;290:1157–65.
55. Klamen DL, Williams RG. The effect of medical education on students' patient-satisfaction ratings. *Acad Med*. 1997;72:57–61.
56. Fadhilah M, Oda Y, Emura S, Yoshioka T, Koizumi S, Onishi H, et al. Patient satisfaction questionnaire for medical students' performance in a hospital outpatient clinic: a cross-sectional study. *Tohoku J Exp Med*. 2011;225:249–54.
57. Bombeke K, Van Roosbroeck S, De Winter B, Debaene L, Schol S, Van Hal G, et al. Medical students trained in communication skills show a decline in patient-centred attitudes: an observational study comparing two cohorts during clinical clerkships. *Patient Educ Couns*. 2011;84:310–8.
58. Loureiro E, Severo M, Bettencourt P, Ferreira MA. Third year medical students perceptions towards learning communication skills: implications for medical education. *Patient Educ Couns*. 2011;85:e265–71.
59. Bylund CL, Makoul G. Empathic communication and gender in the physician–patient encounter. *Patient Educ Couns*. 2002;48:207–16.
60. Chen D, Lew R, Hershman W, Orlander J. A cross-sectional measurement of medical student empathy. *J Gen Intern Med*. 2007;22:1434–8.
61. Kataoka HU, Koide N, Ochi K, Hojat M, Gonnella JS. Measurement of empathy among Japanese medical students: psychometrics and score differences by gender and level of medical education. *Acad Med*. 2009;84:1192–7.
62. Quince TA, Parker RA, Wood DF, Benson JA. Stability of empathy among undergraduate medical students: a longitudinal study at one UK medical school. *BMC Med Educ*. 2011;11:90.

63. Magalhães E, Salgueira AP, Costa P, Costa MJ. Empathy in senior year and first year medical students: a cross-sectional study. *BMC Med Educ.* 2011;11:52.
64. Nunes P, Williams S, Sa B, Stevenson K. A study of empathy decline in students from five health disciplines during their first year of training. *Int J Med Educ.* 2011;2:12–7.
65. Dehning S, Girma E, Gasperi S, Meyer S, Tesfaye M, Siebeck M. Comparative cross-sectional study of empathy among first year and final year medical students in Jimma University, Ethiopia: steady state of the heart and opening of the eyes. *BMC Med Educ.* 2012;12:34.
66. Costa P, Magalhães E, Costa MJ. A latent growth model suggests that empathy of medical students does not decline over time. *Adv Health Sci Educ Theory Pract.* 2012.
67. Hojat M, Zuckerman M, Magee M, Mangione S, Nasca T, Vergare M, et al. Empathy in medical students as related to specialty interest, personality, and perceptions of mother and father. *Pers Individ Dif.* 2005;39:1205–15.
68. Blanch DC, Hall JA, Roter DL, Frankel RM. Medical student gender and issues of confidence. *Patient Educ Couns.* 2008;72:374–81.
69. Wright KB, Bylund C, Ware J, Parker P, Query JL, Baile W. Medical student attitudes toward communication skills training and knowledge of appropriate provider–patient communication: a comparison of first-year and fourth-year medical students. *Med Educ.* 2006;11.
70. Hojat M, Gonnella JS, Mangione S, Nasca TJ, Veloski JJ, Erdmann JB, et al. Empathy in medical students as related to academic performance, clinical competence and gender. *Med Educ.* 2002;36:522–7.
71. Duffy FD, Gordon GH, Whelan G, Cole-Kelly K, Frankel R, Buffone N, et al. Assessing competence in communication and interpersonal skills: the Kalamazoo II report. *Acad Med.* 2004;79:495–507.
72. Lim BT, Moriarty H, Huthwaite M, Gray L, Pullon S, Gallagher P. How well do medical students rate and communicate clinical empathy? *Med Teach.* 2012;1–6.
73. Perera J, Mohamadou G, Kaur S. The use of objective structured self-assessment and peer-feedback (OSSP) for learning communication skills: evaluation using a controlled trial. *Adv Health Sci Educ Theory Pract.* 2010;15:185–93.
74. Holmboe ES. Faculty and the observation of trainees' clinical skills: problems and opportunities. *Acad Med.* 2004;79:16–22.
75. Makoul G. The SEGUE framework for teaching and assessing communication skills. *Patient Educ Couns.* 2001;45:23–34.
76. Pedersen R. Empirical research on empathy in medicine – a critical review. *Patient Educ Couns.* 2009;76:307–22.
77. Teherani A, Hauer KE, O'Sullivan P. Can simulations measure empathy? Considerations on how to assess behavioral empathy via simulations. *Patient Educ Couns.* 2008;71:148–52.
78. Rose M, Wilkerson L. Widening the lens on standardized patient assessment: what the encounter can reveal about the development of clinical competence. *Acad Med.* 2001;76:856–9.
79. Neumann M, Edelhäuser F, Tauschel D, Fischer MR, Wirtz M, Woopen C, et al. Empathy decline and its reasons: a systematic review of studies with medical students and residents. *Acad Med.* 2011;86:996–1009.
80. Chen DCR, Kirshenbaum DS, Yan J, Kirshenbaum E, Aseltine RH. Characterizing changes in student empathy throughout medical school. *Med Teach.* 2012;34:305–11.
81. Craig JL. Retention of interviewing skills learned by first-year medical students: a longitudinal study. *Med Educ.* 1992;26:276–81.
82. Engler CM, Saltzman GA, Walker ML, Wolf FM. Medical student acquisition and retention of communication and interviewing skills. *J Med Educ.* 1981;56:572–9.
83. Cleland J, Foster K, Moffat M. Undergraduate students' attitudes to communication skills learning differ depending on year of study and gender. *Med Teach.* 2005;27:246–51.
84. Woloschuk W, Harasym PH, Temple W. Attitude change during medical school: a cohort study. *Med Educ.* 2004;38:522–34.
85. Colliver JA, Conlee MJ, Verhulst SJ, Dorsey JK. Reports of the decline of empathy during medical education are greatly exaggerated: a reexamination of the research. *Acad Med.* 2010;85:588–93.
86. Rahimi-Madiseh M, Tavakol M, Dennick R, Nasiri J. Empathy in Iranian medical students: a preliminary psychometric analysis and differences by gender and year of medical school. *Med Teach.* 2010;32:e471–8.
87. Roh M-S, Hahn B-J, Lee DH, Suh DH. Evaluation of empathy among Korean medical students: a cross-sectional study using the Korean Version of the Jefferson Scale of Physician Empathy. *Teach Learn Med.* 2010;22:167–71.
88. McKenna L, Boyle M, Brown T, Williams B, Molloy A, Lewis B, et al. Levels of empathy in undergraduate midwifery students: an Australian cross-sectional study. *Women Birth.* 2011;24:80–4.
89. Benbassat J, Bauml R. Teaching doctor–patient interviewing skills using an integrated learner and teacher-centered approach. *Am J Med Sci.* 2001;322:349–57.
90. Bombeke K, Symons L, Vermeire E, Debaene L, Schol S, De Winter B, et al. Patient-centredness from education to practice: the “lived” impact of communication skills training. *Med Teach.* 2012;34:e338–48.
91. Essers G, Van Weel-Baumgarten E, Bolhuis S. Mixed messages in learning communication skills? Students comparing role model behaviour in clerkships with formal training. *Med Teach.* 2012;34:e659–65.
92. Kaufman DM, Laidlaw TA, Macleod H. Communication skills in medical school: exposure, confidence, and performance. *Acad Med.* 2000;75 10 Suppl.:S90–2.
93. Langille DB, Kaufman DM, Laidlaw TA, Sargeant J, MacLeod H. Faculty attitudes towards medical communication and their perceptions of students' communication skills training at Dalhousie University. *Med Educ.* 2001;35:548–54.
94. Roter DL, Hall JA, Aoki Y. Physician gender effects in medical communication: a meta-analytic review. *JAMA.* 2002;288:756–64.
95. Davis H, Nicholaou T. A comparison of the interviewing skills of first- and final-year medical students. *Med Educ.* 1992;26:441–7.
96. Rees C, Sheard C, McPherson A. Communication skills assessment: the perceptions of medical students at the University of Nottingham. *Med Educ.* 2002;36:868–78.
97. Haidet P, Kelly PA, Chou C. Characterizing the patient-centeredness of hidden curricula in medical schools: development and validation of a new measure. *Acad Med.* 2005;80:44–50.
98. Egnew TR, Wilson HJ. Faculty and medical students' perceptions of teaching and learning about the doctor–patient relationship. *Patient Educ Couns.* 2010;79:199–206.
99. Van de Pol MHJ, van Weel-Baumgarten EM. Challenges in communication during clerkships: a case report. *Med Teach.* 2012;34:848–9.
100. Wear D, Zaroni J. Can compassion be taught? Let's ask our students. *J Gen Intern Med.* 2008;23:948–53.
101. Tavakol S, Dennick R, Tavakol M. Medical students' understanding of empathy: a phenomenological study. *Med Educ.* 2012;46:306–16.
102. Hojat M, Vergare MJ, Maxwell K, Brainard G, Herrine SK, Isenberg GA, et al. The devil is in the third year: a longitudinal study of erosion of empathy in medical school. *Acad Med.* 2009;84:1182–91.
103. Humphris GM, Kaney S. Assessing the development of communication skills in undergraduate medical students. *Med Educ.* 2001;35:225–31.
104. Samuels ML, Witmer JA. Statistics for the life sciences; 2003. p. 197–202.
105. Crane JA. Patient comprehension of doctor–patient communication on discharge from the emergency department. *J Emerg Med.* 1994;15:1–7.
106. Benbassat J, Bauml R. A step-wise role playing approach for teaching patient counseling skills to medical students. *Patient Educ Couns.* 2002;46:147–52.
107. Loureiro EM, Severo M, Bettencourt P, Ferreira MA. Attitudes and anxiety levels of medical students towards the acquisition of competencies in communication skills. *Patient Educ Couns.* 2011;85:e272–7.
108. Elderkin-Thompson V, Waitzkin H. Differences in clinical communication by gender. *J Gen Intern Med.* 1999;14:112–21.
109. Hojat M, Gonnella JS, Nasca TJ, Mangione S, Vergare M, Magee M. Physician empathy: definition, components, measurement, and relationship to gender and specialty. *Am J Psychiatry.* 2002;159:1563–9.
110. Wiskin CMD, Allan TF, Skelton JR. Gender as a variable in the assessment of final year degree-level communication skills. *Med Educ.* 2004;38:129–37.
111. Masson AM, Cadot M, Anseau M. [Failure effects and gender differences in perfectionism]. *Encephale.* 2003;29:125–35.
112. Windish DM, Price EG, Clever SL, Magaziner JL, Thomas PA. Teaching medical students the important connection between communication and clinical reasoning. *J Gen Intern Med.* 2005;20:1108–13.
113. Clack GB, Allen J, Cooper D, Head JO. Personality differences between doctors and their patients: implications for the teaching of communication skills. *Med Educ.* 2004;38:177–86.
114. Martin LR, Dimatteo MR. The oxford handbook of health communication, behavior change, and treatment adherence. Oxford University Press; 2013.