



SEÇÃO: EDUCATION IN HEALTH SCIENCES

Deepening the teaching and learning of clinical communication: the importance of reflection and feedback in health education

Aprofundando o ensino e aprendizagem de comunicação clínica: a importância da reflexão e do feedback no ensino em saúde

Renato Soleiman

Franco¹

orcid.org/0000-0003-1176-480X
paum@uol.com.br

Camila Ament Giuliani
dos Santos Franco²

orcid.org/0000-0002-3686-5044
camilaament@gmail.com

Orit Karnieli-Miller³

orcid.org/0000-0002-5790-0697
oritkm@tauex.tau.ac.il

Received on: Jan. 21st, 2021.

Approved on: May. 24th, 2021.

Published on: August. 11th, 2021.

Abstract

Aims: clinical communication (CC) relates to health professionals' interaction with patients/families. CC is fundamental for the physicians' role. This paper aims to contribute to the discussion about reflection and feedback for meaningful teaching and learning of CC.

Methods: the authors provided a short review and conceptual discussion of the history and nature of CC teaching, followed by exploring the role of reflection and feedback in teaching CC.

Results: communicating well can be challenging as it requires medical students and professionals to adapt their communication to each patient/family while obtaining all the needed information, conveying trustworthiness, care, and compassion. The teaching of CC to medical students involves deepening the doctor-patient relationship's technical, relational, and emotional elements. CC requires teaching that is flexible and tailored to the participants' needs. Therefore, teaching CC must go beyond asking the appropriate question or applying specific checklist-based behaviours. In teaching CC, it is crucial to give medical students support to discuss personal and institutional barriers and attitudes and explore how to transfer their learning to clinical practice. To that end, reflection should be encouraged to allow students to express difficulties and feelings and enhance their understanding of themselves and others. Within this process, feedback is essential to moving beyond skill-based teaching to reflection-based learning.

Conclusion: the move from skills-based learning requires using reflective processes and feedback to allow students to learn about their communication tendencies and needs to become more flexible and attuned to different patient's needs in clinical encounters.

Keywords: medical education, communication skills, medical students.

Resumo

Objetivos: a comunicação clínica (CC) está relacionada à interação entre profissionais de saúde e pacientes ou familiares, sendo fundamental para prática médica. Este artigo tem como objetivo contribuir para a discussão sobre reflexão e feedback no ensino e aprendizagem significativos de CC.

Métodos: os autores realizaram uma breve revisão e discussão conceitual da história e da natureza do ensino do CC, seguida pela exploração do papel da reflexão e do feedback no ensino de CC.

Resultados: comunicar-se bem pode ser desafiador, pois exige que os estudantes de medicina e profissionais adaptem sua comunicação a cada paciente/família enquanto obtêm todas as informações necessárias, transmitindo confiabilidade, cuidado e compaixão. O ensino do CC para estudantes de medicina envolve o aprofundamento de elementos técnicos, relacionais e emocionais da relação médico-paciente. A CC requer um ensino flexível e adaptado às necessidades dos estudantes. Portanto, ensinar CC deve ir além de fazer a pergunta apropriada ou aplicar comportamentos específicos baseados em listas de verificação. No ensino do CC, é crucial dar aos



Artigo está licenciado sob forma de uma licença
[Creative Commons Atribuição 4.0 Internacional](https://creativecommons.org/licenses/by/4.0/).

¹ Pontifical Catholic University of Parana (PUCPR), PR, Brazil.

² Pontifical Catholic University of Parana (PUCPR), PR, Brazil; Faculdades Pequeno Príncipe, Curitiba, PR, Brazil.

³ Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.

estudantes de medicina apoio para discutir as barreiras e atitudes pessoais e institucionais e explorar como transferir seu aprendizado para a prática clínica. Para tanto, deve-se estimular a reflexão para permitir que os alunos expressem dificuldades e sentimentos e ampliem sua compreensão de si e dos outros. Nesse processo, o feedback é essencial para ir além do ensino baseado em habilidades para o aprendizado baseado em reflexão.

Conclusão: a mudança de uma aprendizagem baseada em habilidades requer o uso de um processo reflexivo e feedback para permitir que os alunos aprendam sobre si, assim como, sobre se tornarem mais flexíveis e sintonizados com as diferentes necessidades do paciente nos encontros clínicos.

Palavras-chave: educação médica, habilidades de comunicação, estudantes de medicina.

Introduction

Communication involves an interactive process (mediated verbally and non-verbally) between individuals. It connects physicians with patients, family members, colleagues, teams, institutions, and society in general. Clinical communication (CC) relates to physicians' interactions with patients/families and is among the pillars of medical training. In 1968, Professor Davis from Cornell University recorded doctor-patient interactions, analyzing communication patterns between physicians (senior and juniors) and patients. He observed attempts by doctors and patients to control each other, physicians' failures to provide necessary information to patients, and physicians' tendencies to communicate in unidirectional ways (such as by asking the questions and deciding on the treatment while expecting patients to answer the questions and follow the prescription). Davis concludes that junior and senior doctors "exhibit high rates of communication difficulty," calling attention to the need for medical training on these neglected behavioral aspects (1). More than 50 years later, these challenges endure (2). Problems with doctor-patient communication remain among the leading causes of patients' complaints (3) and a challenge in medical education (4).

Broadening the understanding of clinical communication: communication as a process

The goals of CC in medical encounters include aspects related to information (gathering, providing,

and sharing), decision-making processes (dealing with uncertainty and sharing power and knowledge with patients/family), patient participation (self-management and autonomy), building trustful, healing relationships, and responses to emotions (5). In the 1950s, Balint highlighted the importance of physicians' attitudes and communication in promoting healing and relieving patients' suffering through careful listening and a deeper understanding of patients' needs (6).

Approximately half a century after Balint's ideas and Davis's research, the United Kingdom consensus stated in 2008 that "respect for others" is a fundamental domain in communication (7). Salmon and Yong further discussed the importance of creativity and holistic care in communication. For them, a skilled communicator considers patients/families in their wholeness (holistic approach), adapting the communication to particular patients, context, and situational needs through original solutions (8). Focusing communication on the patient or on the doctor-patient relationship reinforces each person's uniqueness and the physician's own trustworthiness, care, and compassion (9). Thus, CC involves deepening the technical, relational, and emotional elements of the doctor-patient relationship.

The idea behind CC is that people cannot be reduced to diseases and treatment plans, and medicine and medical care cannot be reduced to science that involves making the right diagnoses and applying standardized treatments. Physicians must communicate in ways that embrace patients' life narratives (10). Physicians have the challenge in clinical practice of finding ways to promote a genuine, respectful connection with the patient that enables history taking, clinical thinking, decision-making, patient engagement and participation. Thus, teaching communication must go beyond considering suitable questions to ask, whether touching a patient is appropriate or how much one should look in the patient's eyes. It is crucial to support medical students and discuss the personal and institutional barriers they face, problematizing the transference of learning to clinical practice and helping them

find the best way to communicate. Without this comprehensive understanding of communication and applying theory in practice, students feel communication is a mechanical skill that is useless (11) and inauthentic, leading to negative attitudes toward communication training (12).

Insights on teaching strategies

The teaching of CC in medical education includes various practices, such as traditional lectures, arts, small group discussions, role-plays, simulation-based learning, narrative medicine, observing role models and practicing in clinical settings. In planning the longitudinal curriculum for CC training, teachers understand that communication involves a high level of subjectivity that allows for diversity in learners' communication styles, patients' responses, and non-verbal communication. Thus, it requires teaching that is flexible and tailored to the participants' needs (13). However, much of the focus continues to be given to teaching [communication as] a set of specific skills and behaviors such as open-ended questions, string questions and standardized reactions that students must perform.

Such CC skills are just the tip of the iceberg. Comprehensive teaching and learning methods, such as reflective writing and narrative medicine, can help to bring students closer to themselves and patients' stories and plights (14). Doctor-patient communication involves interactive (such as skills and behaviors, including verbal and non-verbal communication), cognitive, perceptual, emotional, and moral aspects. While it is useful to become aware of the iceberg, responding by simply amending standard behaviors and developing new ones may be the same as being concerned only with tip of the iceberg. Teaching strategies must lead students and teachers to explore, become familiar with, and deal with the "under-the-surface" elements. This awareness can be achieved through reflective practice.

Reflective practice in clinical communication

In 1983, Schon introduced the concept of the reflective practitioner (15), who emerges

through a process named reflective practice or reflection (16). According to Kolb's model, reflection is essential to learning (17) and can help individuals move from making simple observations to the abstraction of concepts. Applying Kolb's model, students are expected to observe their practice reflectively, analyze and conceptualize it (abstraction), and implement improvements based on experiences of communication with patients. These improvements may involve, for example, a higher capacity to handle their own and patients' emotions better, and to become more aware of personal attitudes that can hamper shared decision-making when it is relevant and possible.

Kolb's model provides an important link between reflection and learning. To strengthen this link in the teaching of communication, teachers can facilitate student reflections on four key dimensions of learning. First, they can stimulate in learners a deeper understanding of themselves, others, and the situation. Second, they can focus on cognitive, emotional, and behavioral facets of communication. Third, they can encourage connections between the students' past experiences, present behavior, and future consequences, as well as chosen goals and behaviors (16). And, fourth, they can include social perspectives relevant to a reflective awareness, such as power relations and social contexts (18–20).

These four dimensions of reflection may occur at different times in physicians' or students' practices: before-action, in-action (during), and on-action (after). Reflection before-action helps students and physicians prepare themselves for practice and anticipate challenges by enhancing their awareness of informational gaps and emotional needs (including professional and patient/family needs) and planning how to handle potential communication challenges effectively (16, 21). Reflection in-action occurs during practice, fosters the analysis and understanding of what is happening, and involves self-monitoring and awareness of the patient/family. It is an internal process of questioning whether the interaction is open and comfortable or whether something is missing; it also involves being attentive to clues

and analyzing one's own and others' emotions, concerns, and reactions to adjust to the identified needs. Reflection on-action arises after the situation, ideally, in a safe space. In this case, it is essential to remember (return to the previous experience), reevaluate (consider knowledge, previous experience, and emotions), and refine (building new perspectives and lessons learned).

Various teaching and learning methods, including narrative medicine, mindfulness, and reflective writing, can drive opportunities to reflect. Narrative medicine involves inviting professionals to closely analyze literature or art and write or read about their personal experiences with patients, it increases the creativity and curiosity that professionals need to treat patients, helps them become non-judgmental, and enhances self-awareness. Individuals' stories aid in giving meaning to subjects' life experiences and difficulties, which improves the students' awareness of the patients' uniqueness, revealing, in turn, the profundity of the doctor-patient relationship and communication (22, 23). Mindfulness can promote attentiveness and flexibility in patients' care. Mindfulness teaching has been aligned with affective reflection through meditation and self-awareness, supporting health care workers in handling stress and complex interactions with patients (24,25). Finally, reflective writing can encourage students to remember, recognize, analyze, and understand their interactions with patients in ways that guide their future interactions.

Reflections according to the four dimensions of reflection cited above can be performed during clinical practice and simulation through audio diary records, video analysis, vignette discussion, and personal or group reflective writing, reading, and feedback sessions. Regardless of the activity used, it is essential for teachers to understand the concepts behind the reflection dimensions and provide formal safe spaces in the curriculum to reflect on CC. Reflection may be particularly relevant in fostering students' and professionals' creativity and innovation in adapting their communication to challenging settings, such as CC over the telephone. The reflective practice offers a careful

and respectful means of helping students identify challenges and find creative ways to overcome them. Creating a safe, non-judgmental, and open space where students can truly engage in reflection is crucial to their learning (26).

Supporting students to reflect: the role of feedback

Feedback is a core element for learning; however, students do not receive CC feedback in many contexts (27). Feedback is a process of providing information regarding any aspect of learning, but to be useful, it must go far beyond the provision of information. Feedback may promote students' active participation in a reflective process. To engage students, teachers need to facilitate discussion, activate students' previous knowledge, and bridge the gap between teachers and learners to a respectful and trustful teacher-student communication (28). There is no evidence on how the teacher-learner relationship can be transposed to students' communications with patients. However, considering that role models are essential for teaching communication, teacher-learner communication may play a significant role. Thus, feedback can contribute to CC according to the content of the feedback and the manner in which it is provided.

Structured methods such as ADAPT (ask, discuss, ask, plan together) and R2C2 (relationships, reaction, content, and coaching) can support teachers on how to provide feedback, highlighting the importance of teacher-learner dialogue (29). However, CC involves more than knowledge and skills, taking into consideration emotions and values as well, which makes feedback challenging. Based on written feedback on medical students' reflective journals, Rozental et al. (2020) suggested that the eight following components are needed when giving feedback: 1) focus on the personal content that is of interest to the student; 2) empathize with the emotion; 3) encourage the student; 4) develop reflection through using different questions; 5) be mindful of the student's emotional state; 6) avoid using a negative tone; 7) care and share your own experience as an educator; and 8) maintain an open dialogue to explore the student's experience with

the feedback (30). Thus, feedback is not about communicating the learner's failures or making judgments according to the teacher's perceptions. Feedback, namely in CC, must be empathic, caring, person/student-centered, and encourage reflection. To enable reflective feedback, teachers and students should debate during a learning task, share perceptions, and carefully propose plans for improvement (when necessary).

Reflective feedback should include several components. First, it should explore the learner's experience during the encounter, which includes identifying and acknowledging the learner's strengths and acquired skills. This step should be followed by a shared search for personal perceptions and barriers in the encounter—that is, what did not work well or as expected? Exploring these challenges empathetically is key to building a safe space and allowing for a deeper exploration and understanding of them (including their potential presence in the learner's other interactions and communications). The consequences of these barriers for the student and patient should also be discussed. After identifying the barriers and their consequences and verifying the learner's willingness to work on them, the feedback dialogue can focus on searching for potential ways to resolve these issues that stimulate the student's creativity and own strategies to find solutions. This part of the reflective feedback may also involve challenging the attitude and/or suggesting communication skills that may help. These components can lead to just-in-time teaching, personalized learning experience that can guide the student's future encounters and his/her personal and professional development into a genuinely compassionate, skilled practitioner.

Conclusion

CC is a vehicle for professional practice (31), and many challenges faced by medical students and physicians involve CC. Communicating with patients/families is one of the first teaching courses in medical curricula in which students come close to the physician's role (32). It is important to broaden teachers' understanding

of CC beyond imparting a skill. The teaching and learning of CC must be a developmental process that is longitudinally integrated into the curricula and connected to professional identity formation, as well as clinical and reasoning competencies.

Integrating reflective practices into CC, using various strategies, is important for supporting students' cognitive, behavioral, attitudinal, and emotional development in acquiring the skills and attitudes of a health professional. Providing attentive feedback on the students' reflective processes is also crucial to creating a safe space for the development and learning of CC. Through their feedback, teachers can support students in deepening their self- and situational analysis, stimulating students' engagement in a broader understanding of themselves and CC.

Future perspectives

Communication is about cognition, interaction, values, attitudes, behaviors, and emotions. The verbal and non-verbal expression of communication is just the tip of the iceberg. Exploring what is "beneath the surface" through reflective practice in CC is critical to students' personal development in becoming professionals who can be authentic and respectful and handle different patients' needs.

CC involves caring, responsibility, and connection. Connection is critical for physicians and patients, as well as educators and learners, especially in the context of the heightened exhaustion and difficult emotions experienced in health care (and in medical school), including anger, fear, uncertainty, and burdens related to disease and social and political problems. Communication challenges emphasize the importance of CC not only for supporting clinical and ethical reasoning and relieving patients' suffering but also for appreciating students/health professionals as individuals and reflecting on their current needs and challenges. These challenges require profound reflection by students and teachers and compassionate teaching and feedback that delve beneath the surface of communication to support students development.

Building such powerful learning experiences may seem difficult in an era that encourages online learning and telemedicine. However, these methods can still be used to promote reflection and feedback processes. Students can, for example, record, observe, and reflect on encounters with patients (simulated or real patients) through telemedicine consultation (thinking about what s/he experienced during the encounter and the patient's reactions). Synchronous (just after the consultation) or asynchronous (in another moment) dialogic feedback session focusing on the experience (strengths, challenges, and perceptions) and ways to overcome barriers should follow students' reflections.

Whether mediated by traditional or more innovative approaches, such as online simulations and telemedicine, reflective practice and feedback must always be present in CC teaching and learning (33). Effective teaching and learning of CC require a deeper understanding of CC itself and the individual practicing it. This process goes beyond the learning and mimicry of a skill. Teaching CC is fundamental to medical practice, which is grounded in the idea that the professional is a human and the main healing tool. As such, practitioners must enhance their understanding of themselves and others, reflect on their experiences and interactions, and learn to identify their attitudes, emotions, perceptions, and the skills they need to address the various communication challenges in doctor-patient/family/team interactions. This process is not about imposing restrictions or structures on how students should behave. Rather, it is an ongoing exploration by the student and educator to preserve and enhance students' development toward becoming competent, caring, and compassionate communicators.

Notes

Acknowledgments

We thank students, teachers, and healthcare professionals for dedicating their lives to caring for the people in need. We hope that all professionals can work in adequate condition and that their

families receive the necessary support. If we are here now, reflecting and writing this paper, there are hundreds of thousands of healthcare professionals dedicating their life to keep us safe. Thank you all!

Funding

This study did not receive financial support from external sources

Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions.

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

References

1. Davis MS. Research in medical education. Attitudinal and behavioral aspects of the doctor-patient relationship as expressed and exhibited by medical students and their mentors. *Acad Med.* 1968;43(3):337-43. <https://doi.org/10.1097/00001888-196803000-00002>
2. Röttele N, Schöpf-Lazzarino AC, Becker S, Körner M, Boeker M, Wirtz MA. Agreement of physician and patient ratings of communication in medical encounters: A systematic review and meta-analysis of interrater agreement. *Patient Educ Couns.* 2020;103(10):1873-82. <https://doi.org/10.1016/j.pec.2020.04.002>
3. Kee JWY, Khoo HS, Lim I, Koh MYH. Communication skills in patient-doctor interactions: learning from patient complaints. *Heal Prof Educ.* 2017;4(2):97-106. <https://doi.org/10.1016/j.hpe.2017.03.006>
4. Gilligan C, Brubacher SP, Powell MB. Assessing the training needs of medical students in patient information gathering. *BMC Med Educ.* 2020;20(1):61. <https://doi.org/10.1186/s12909-020-1975-2>

5. King A, Hoppe RB. "Best Practice" for patient-centered communication: a narrative review. *J Grad Med Educ.* 2013;5(3):385-93. <https://doi.org/10.4300/JGME-D-13-00072.1>
6. Balint M, Balint J. *The Doctor, his patient and the illness.* 2. ed. London: Churchill Livingstone; 2000.
7. Von Fragstein M, Silverman J, Cushing A, Quilligan S, Salisbury H, Wiskin C. UK consensus statement on the content of communication curricula in undergraduate medical education. *Med Educ.* 2008;42(11):1100-7. <https://doi.org/10.1111/j.1365-2923.2008.03137.x>
8. Salmon P, Young B. Creativity in clinical communication: from communication skills to skilled communication. *Med Educ.* 2011;45(3):217-26. <https://doi.org/10.1111/j.1365-2923.2010.03801.x>
9. Scholl I, Zill JM, Härter M, Dirmaier J. An integrative model of patient-centeredness – a systematic review and concept analysis. *PLoS One.* 2014;9(9):e107828. <https://doi.org/10.1371/journal.pone.0107828>
10. Charon R. At the membranes of care. *Acad Med.* 2012;87(3):342-7. <https://doi.org/10.1097/ACM.0b013e3182446fbb>
11. Donetto S. Medical students and patient-centred clinical practice: The case for more critical work in medical schools. *Br J Sociol Educ* 2012;33(3):431-49. <https://doi.org/10.1080/01425692.2012.662821>
12. Ruiz Moral R, de Leonardo CG, Martínez FC, Monge Martín D, García de Leonardo C, Caballero Martínez F, et al. Medical students' attitudes toward communication skills learning: comparison between two groups with and without training [Response to letter]. *Adv Med Educ Pract.* 2019;10:411-2. <https://doi.org/10.2147/amep.s212021>
13. Brannick MT, Erol-Korkmaz HT, Prewett M. A systematic review of the reliability of objective structured clinical examination scores. *Med Educ.* 2011;45(12):1181-9. <https://doi.org/10.1111/j.1365-2923.2011.04075.x>
14. Charon R. Narrative Medicine. *JAMA.* 2001;286(15):1897. <https://doi.org/10.1001/jama.286.15.1897>
15. Schön DA, Schon D. *The Reflective Practitioner: How Professionals Think in Action.* New York, NY: Basic Books; 1983.
16. Karnieli-Miller O. Reflective practice in the teaching of communication skills. *Patient Educ Couns.* 2020;103(10):2166-72. <https://doi.org/10.1016/j.pec.2020.06.021>
17. Kolb, DA. *Experiential learning: experience as a source of learning and development.* New Jersey: Prentice-Hall; 1984.
18. Manca A, Gormley GJ, Johnston JL, Hart ND. Honoring medicine's social contract. *Acad Med.* 2020;95(6):958-67. <https://doi.org/10.1097/ACM.0000000000003059>
19. Gomes AP, Rego S. Paulo Freire: contribuindo para pensar mudanças de estratégias no ensino de medicina. *Rev Bras Educ Med.* 2014; 38(3):299-307.
20. Ellaway RH. Postmodernism and medical education. *Acad Med.* 2020; 95(6):856-9. <https://doi.org/10.1097/ACM.0000000000003136>
21. Meitar D, Karnieli-Miller O, Eidelman S. The impact of senior medical students' personal difficulties on their communication patterns in breaking bad news. *Acad Med* 2009; 84(11):1582-94. <https://doi.org/10.1097/ACM.0b013e3181bb2b94>
22. Grossman E, Cardoso MHCA. A narrativa como ferramenta na educação médica. *Rev Hosp Univ Pedro Ernesto.* 2014; 13(4):32-8. <https://doi.org/10.12957/rhupe.2014.13945>
23. Greenhalgh T, Hurwitz B. Narrative based medicine: Why study narrative? *BMJ.* 1999;318(7175):48-50. <https://doi.org/10.1136/bmj.318.7175.48>
24. Sternlieb Jeffrey L. A Guide to introducing and integrating reflective practices in medical education. *Int J Psychiatry Med.* 2015; 49(1):95-105. <https://doi.org/10.2190/PM.49.1.g>
25. Chan KDKD, Humphreys L, Mey A, Holland C, Wu C, Rogers GDGDGD. Beyond communication training: The MaRIS model for developing medical students' human capabilities and personal resilience. *Med Teach.* 2020;42(2):187-95. <https://doi.org/10.1080/0142159X.2019.1670340>
26. de la Croix A, Veen M. The reflective zombie: Problematizing the conceptual framework of reflection in medical education. *Perspect Med Educ.* 2018; 7(6):394-400. <https://doi.org/10.1007/s40037-018-0479-9>
27. Ruiz-Moral R, García de Leonardo C, Cerro Pérez A, Monge Martín D, Caballero Martínez F. How communication skills are being incorporated, taught, and assessed in Spanish Medical Schools. *Educ Medica.* 2020. Epub 2020 Mar 03 <https://doi.org/10.1016/j.edumed.2019.12.003>
28. Ramani S, Könings KD, Ginsburg S, van der Vleuten CP. Feedback redefined: principles and practice. *J Gen Intern Med.* 2019;34(5):744-9. <https://doi.org/10.1007/s11606-019-04874-2>
29. Andolsek K, Padmore J, Hauer K, Edgar L, Holmboe E. Clinical competency committees – a guidebook for programs. Accreditation Council for Graduate Medical Education [Internet] 3. ed. Chicago, IL: Accreditation Council for Graduate Medical Education. [cited 2020 March 15]. Available from: <http://www.acgme.org/acgmeweb/Portals/0/ACGMEClinicalCompetencyCommitteeGuidebook.pdf>
30. Rozental L, Meitar D, Karnieli-Miller O. Medical students' experiences and needs from written reflective journal feedback. *Med Educ.* 2021;55(4):505-17. <https://doi.org/10.1111/medu.14406>

31. Brown J. Transferring clinical communication skills from the classroom to the clinical environment: perceptions of a group of medical students in the United kingdom. Acad Med. 2010; 85(6):1052-9.

32. Vågan A. Medical students' perceptions of identity in communication skills training: A qualitative study. Med Educ. 2009;43(3):254-9. <https://doi.org/10.1111/j.1365-2923.2008.03278.x>

33. Karnieli-Miller O, Neufeld-Kroszynski G, Karnieli-Miller O, Neufeld-Kroszynski G. Combining machine learning and human reflective process for teaching communication skills. Med Educ. 2020;54(12):1093-5. <https://doi.org/10.1111/medu.14391>

Renato Soleiman Franco

Psychiatrist, PhD in Medicine from the Faculty of Medicine of University of Porto, Portugal; professor in the School of Medicine and in the Post Graduate Program in Bioethics at Pontifical University of Paraná (PUCPR), Curitiba, Brazil.

Camila Ament Giuliani dos Santos Franco

Family Physician, PhD in Medicine from the Faculty of Medicine of University of Porto, Portugal; adjunct professor in the School of Medicine at Pontifical University of Paraná (PUCPR), Curitiba, Brazil.

Orit Karnieli-Miller

Social Work, BA, MA and PhD; Head of the Department of Medical Education, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel.

Mailing address

Renato Soleiman Franco
Pontifical Catholic University of Paraná
School of Medicine
Av. Imaculada Conceição, 1155
Prado Velho, 80215-901
Curitiba, PR, Brazil

Os textos deste artigo foram revisados pela Poá Comunicação e submetidos para validação do(s) autor(es) antes da publicação.