

TEACHING AND ASSESSMENT METHODS IN PRECEPTORSHIP IN HEALTH
RESIDENCIES: CROSS-SECTIONAL STUDY

MÉTODOS DE ENSINO E AVALIAÇÃO NA PRECEPTORIA DE RESIDÊNCIAS EM
SAÚDE: ESTUDO TRANSVERSAL

MÉTODOS DE ENSEÑANZA Y EVALUACIÓN EM LA PRECEPTORÍA DE
RESIDENCIAS EM SALUD: ESTUDIO TRANSVERSAL



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ABSTRACT: Through a cross-sectional study, this study aimed to identify the teaching and evaluation methodologies used by health residency preceptors, in addition to associated factors, prior to a specialization course in multi-professional preceptorship. At the beginning of the course, between August and September 2022, 1112 preceptors from all regions of the country and levels of health care responded to an online questionnaire. The most used teaching and assessment methods are, respectively, case discussion (92.09%) and direct observation (78.69%). Preceptors who receive additional remuneration use more PBL and flipped classrooms, assessment in clinical practice environments, and 360° assessment. Assessment methods involving simulation and Mini-CEX are used by less than 10% of preceptors. Only 53.15% offer feedback on formal assessments. The variety and frequency of methodologies used, as well as feedback provision, must be considered when planning new preceptorship training.

KEYWORDS: Preceptorship. Internship and residency. Internship, nonmedical. Multiprofessional residency.

RESUMO: Este estudo teve como objetivo identificar os métodos de ensino e avaliação utilizados por preceptores de residências em saúde, além dos fatores associados, antes de um Curso de Especialização em Preceptoría Multiprofissional, por meio de um estudo transversal. No início da oferta do curso, entre agosto e setembro de 2022, 1112 preceptores de todas as regiões do país e de diferentes níveis de atenção à saúde responderam a um questionário online. Os métodos de ensino e avaliação mais utilizados foram, respectivamente, a discussão de caso (92,09%) e a observação direta (78,69%). Preceptores que recebem bolsa complementar utilizam mais frequentemente a aprendizagem baseada em problemas (Problem Based Learning - PBL) e a sala de aula invertida, além da avaliação em ambientes da prática clínica e a avaliação 360°. Métodos de avaliação envolvendo simulação e o mini-exercício clínico avaliativo (Mini-CEX) são utilizados por menos de 10% dos preceptores. Apenas 53,15% dos preceptores oferecem feedback das avaliações formais. A variedade e a frequência de uso das metodologias, bem como a oferta de feedback, devem ser consideradas no planejamento de novas formações em preceptoría.

PALAVRAS-CHAVE: Preceptoría. Internato e residência. Residência não médica não odontológica. Residência multiprofissional.

RESUMEN: Este estudio tuvo como objetivo identificar las metodologías de enseñanza y evaluación utilizadas por los preceptores de residencias en salud, además de los factores asociados, previo a un curso de especialización en preceptoría multiprofesional, a través de un estudio transversal. Al inicio de la oferta, entre agosto y septiembre de 2022, 1112 preceptores de todas las regiones del país y niveles de atención de salud respondieron a un cuestionario electrónico. Los métodos de enseñanza y evaluación más utilizados son, respectivamente, la discusión de casos (92,09%) y la observación directa (78,69%). Los preceptores que reciben remuneración adicional utilizan más PBL y aulas invertidas, evaluación en entornos de práctica clínica y evaluación de 360°. Menos del 10% de los preceptores utilizan métodos de evaluación que implican simulación y el Mini-CEX. Sólo el 53,15% ofrece retroalimentación sobre evaluaciones formales. Se debe considerar la variedad y frecuencia del uso de metodologías y la provisión de retroalimentación al planificar formación de preceptoría.

PALABRAS CLAVE: Preceptoría. Internado y residencia. Residencia no médica no dental. Residencia multiprofesional.

Introduction

Health residencies correspond to a mode of in-service postgraduate training, in the form of specialization courses, conducted in health institutions under the supervision of healthcare professionals, from whom high ethical and professional qualifications are expected (Brasil, 2021). In Brazil, medical residency began in the 1940s and was regulated in 1981 (Sousa, 1985). The first residency in a healthcare professional area occurred in 1976, but this type of training for the Unified Health System (SUS) was only legally established in 2005, with significant expansion starting in 2010 (Silva, 2018).

Residencies in healthcare professional areas (uni and multiprofessional) are understood as an opportunity to construct healthcare training that responds to the diversity and complexity of health needs in the daily context of the Unified Health System (SUS) (Silva, 2018). These residencies cover the following professional areas: Biomedicine, Biological Sciences, Physical Education, Nursing, Pharmacy, Physiotherapy, Speech-Language Pathology, Veterinary Medicine, Nutrition, Dentistry, Psychology, Social Work, Occupational Therapy, Public Health, and Medical Physics (Brasil, 2014a). These aspects reflect the need for training geared towards interdisciplinary work and qualified preceptorship capable of meeting the challenges of in-service education.

While the resident is a healthcare professional, already graduated, and seeking postgraduate training, the preceptor is a professional who teaches in their workplace and, in assuming the role of a preceptor, "needs to understand the curriculum structure and organization, educational objectives, principles, and values, as well as the context guiding this practice" (Ribeiro *et al.*, 2020, p. 6). The competencies required of the preceptor include knowledge of teaching, teaching skills, and attitudes, the ability to observe and analyze the resident's activities, provide constant feedback, and understand learning theories and learning styles, as well as the specifics of adult learning (Barreiros *et al.*, 2020).

Considering the preceptor in their primary role as an educator, it is important to highlight that there are particularities in this role that differ from classroom teaching, as they need to provide conditions for the technical and ethical development of residents in practice settings, as well as "evaluate the resident on the moral and technical issues of professional practice, offering feedback on their development" (Botti; Rego, 2011, p. 80, our translation).

In this context of pedagogical processes from the perspective of teaching-service integration, the preceptor focuses on developing the desirable competencies of the resident. Professional competencies can be understood as the ability to mobilize, articulate, and integrate

"knowledge, skills, and attitudes, using available resources, and expressed in initiatives and actions that translate into performances capable of successfully solving, with relevance and timeliness, the challenges presented in practice" (Brasil, 2014b, p. 4, our translation).

Considering the need for professional qualification of preceptors working in health residency programs (PR), various preceptorship training courses have begun to be offered in Brazil, driven by public incentive policies and public-private partnerships. One such course, entitled the Specialization Course in Multiprofessional Preceptorship in the Health Area, offered 1,700 spots and aimed to contribute to the development of competencies among preceptors of medical, multiprofessional, and health area residencies across all regions of the country. This course was offered by Hospital Moinhos de Vento (HMV) in partnership with the Ministry of Health, through the Institutional Development Support Program of SUS (Proadi-SUS).

Given the variety of PR in health in Brazil and the particularities of in-service teaching, it is essential to understand the teaching and assessment practices in these programs to contribute to the qualification of preceptors and future residents. Thus, this study aimed to identify the teaching and assessment methods used by preceptors before the Specialization Course in Multiprofessional Preceptorship in the Health Area, as well as to identify factors associated with these variables. This study can support future health education policies, encouraging the training of preceptors and in-service training at the national level, resulting in the strengthening of healthcare provision in SUS.

Method

This is a cross-sectional study with a quantitative approach, requested by the Ministry of Health through the Secretariat of Labor and Health Education Management (SGTES), and conducted by Hospital Moinhos de Vento (HMV) via Proadi-SUS. At the beginning of the Specialization Course offering, between August and September 2022, enrolled students were invited to respond to a specific electronic questionnaire using the REDCap (Research Electronic Data Capture) platform. This research is part of a comprehensive survey on the students, who are preceptors, before taking the course. This article presents data related to their pedagogical practices.

In the course's Virtual Learning Environment (Moodle), a Uniform Resource Locator (URL) was made available, directing participants to read the virtual Informed Consent Form

(ICF). Upon accepting the ICF, the questionnaire was made available for response. One week after the questionnaire was made available, an alert was issued via Moodle, reminding students who had not yet responded about the importance of participating in the research.

The questionnaire included multiple-choice questions addressing sociodemographic and professional profiles, education, teaching and assessment methods used in the PR, and feedback provision. Higher-level education (specialization, master's, or doctorate) was considered for the analysis of variables related to postgraduate training. When the course was referred to as being in progress or completed, both cases were grouped into the same category.

Data were analyzed using R software version 4.2.2. Categorical variables are presented as absolute (n) and relative (%) frequencies. The percentages presented in Tables 1 and 2 refer to the proportion of preceptors (total and at each level of care) who reported using each teaching or assessment method; in Tables 3 and 4, the percentages refer to the proportion of the sample in the column. The Chi-Square Test was used to verify the association between categorical variables. The statistical significance level was set at 5% two-tailed in all analyses. Additionally, for relevant cross-tabulations, the results were presented through Prevalence Ratios (PR) and their respective 95% Confidence Intervals (CI95%), along with the Hypothesis Test to test the Null Hypothesis (H₀) that PR = 1.

Data collected were treated anonymously, and the research protocol was approved by the research ethics committee of *Hospital Moinhos de Vento*, under Opinion No. 5.605.850.

Results

Of the 1561 students who started the course, 1112 (71.23%) responded to the questionnaire. The majority of respondents are female (84.80%) and aged between 31 and 50 years (72.57%). The largest proportion of professionals is from the nursing field (35.61%), followed by physiotherapy (13.93%) and medicine (10.34%). The only health training area not represented is public health.

There was representation from the three levels of care and from medical, multiprofessional, and health professional residency programs; however, most preceptors work at the tertiary level of healthcare (57.2%) in multiprofessional health residency programs (73.4%). Preceptors from all regions of the country participated, with a predominance from the Southeast (32.19%) and Northeast (30.49%) regions.

The most used teaching method is case discussion, followed by the immediate study of cases in care, practical classes, expository classes, and group work, which are adopted by the majority of preceptors (Table 1).

Table 1 – Teaching methods used in preceptorship practice by level of healthcare

Teaching Methods Used	Total n (%)	Level of Care ^a n (%)		
		Primary	Secondary	Tertiary
Case discussion	1024 (92,09)	266 (89,56)	188 (92,16)	592 (93,08)
Immediate study of cases in care	644 (57,91)	168 (56,57)	120 (58,82)	378 (59,43)
Practical class	620 (55,76)	153 (51,52)	114 (55,88)	368 (57,86)
Expository class	594 (53,42)	125 (42,09)	102 (50)	385 (60,53)
Group work	583 (52,43)	189 (63,64)	106 (51,96)	300 (47,17)
Seminars	551 (49,55)	138 (46,46)	93 (45,59)	332 (52,2)
Direct observation - "shadow"	471 (42,36)	133 (44,78)	80 (39,22)	263 (41,35)
PBL (Problem-Based Learning)	296 (26,62)	92 (30,98)	51 (25)	167 (26,26)
Medical record audit	283 (25,45)	74 (24,92)	45 (22,06)	164 (25,79)
Analysis of significant events	243 (21,85)	66 (22,22)	35 (17,16)	149 (23,43)
Flipped classroom	219 (19,69)	64 (21,55)	37 (18,14)	130 (20,44)
Simulation	144 (12,95)	40 (13,47)	28 (13,73)	79 (12,42)
magazine club	106 (9,53)	10 (3,37)	8 (3,92)	91 (14,31)
TBL (Team-Based Learning)	103 (9,26)	37 (12,46)	21 (10,29)	46 (7,23)
Role Play	39 (3,51)	12 (4,04)	10 (4,9)	20 (3,14)
Others	60 (5,4)	15 (5,05)	11 (5,39)	38 (5,97)

^a Multiple responses were allowed.

Source: Prepared by the authors, 2023.

When compared with primary healthcare (PHC), tertiary care showed lower frequencies of using TBL (RP 0.58, 95% CI 0.38–0.87, p 0.009) and group work (RP 0.74, 95% CI 0.65–0.83, p <0.001), and higher frequencies of lecture (RP 1.42, 95% CI 1.24–1.66, p <0.001) and journal club (RP 4.25, 95% CI 2.24–8.04, p <0.001). Having a career plan did not affect the frequency of using different teaching methods. However, preceptors who receive additional stipends showed a higher frequency of using PBL (RP 1.36, 95% CI 1.1–1.67, p = 0.005), flipped classroom (RP 1.36, 95% CI 1.05–1.76, p 0.021), and group work (RP 1.22, 95% CI 1.08–1.37, p 0.002), while using journal club less frequently (RP 0,38, IC95% 0,21 - 0,7, p 0,001).

Residency training was positively associated with case discussion (RP 1.04, 95% CI 1.01–1.08, p 0.011), immediate study of cases in attendance (RP 1.12, 95% CI 1.01–1.23, p

0.033), and especially with journal club (RP 3.07, 95% CI 2.11–4.48, $p < 0.001$). However, there was a negative association with group work (RP 0.82, 95% CI 0.72–0.93, $p 0.001$).

Having another postgraduate degree was also associated with a few methods: having a doctorate was positively associated with flipped classroom (RP 2.14, 95% CI 1.5–3.07, $p < 0.001$), seminars (RP 1.25, 95% CI 1.05–1.48, $p 0.017$), lecture (RP 1.47, 95% CI 1.25–1.73, $p < 0.001$), and journal club (RP 2.5, 95% CI 1.45–4.31, $p 0.001$), while having a master's degree was positively associated with the practical class (RP 1.22, 95% CI 1.05–1.42, $p 0.009$) and lecture (RP 1.3, 95% CI 1.11–1.5, $p 0.001$). Having a specialization was positively associated with the immediate study of cases after attendance (RP 1.5, 95% CI 1.01–1.3, $p 0.03$), and negatively associated with seminars (RP 0.78, 95% CI 0.66–0.91, $p 0.002$).

Regarding assessment methods, direct observation is the most used, followed by oral assessment. Feedback on daily performance is provided by more than 70% of preceptors (Table 2).

Table 2 – Assessment methods used in preceptorship practice and offering feedback on resident performance by level of health care

Resident assessment methods used	Total n (%)	Level of Attention ^a n (%)		
		Primary	Secondary	Tertiary
Direct observation	875 (78,69)	227 (76,43)	154 (75,49)	510 (80,19)
Oral Assessment	362 (32,55)	87 (29,29)	73 (35,78)	208 (32,7)
Objective written test	247 (22,21)	45 (15,15)	49 (24,02)	161 (25,31)
Dissertation written test	175 (15,74)	31 (10,44)	38 (18,63)	114 (17,92)
Portfolio	206 (18,53)	105 (35,35)	42 (20,59)	61 (9,59)
360° Assessment	133 (11,96)	42 (14,14)	19 (9,31)	73 (11,48)
Mini-CEX Instrument	97 (8,72)	30 (10,1)	16 (7,84)	54 (8,49)
Standardized patient	62 (5,58)	17 (5,72)	14 (6,86)	31 (4,87)
Simulated patient	60 (5,4)	17 (5,72)	17 (8,33)	26 (4,09)
OSCE	28 (2,52)	12 (4,04)	3 (1,47)	13 (2,04)
Calgary-Cambridge Questionnaire	19 (1,71)	7 (2,36)	3 (1,47)	10 (1,57)
Video recording of consultations	14 (1,26)	6 (2,02)	3 (1,47)	3 (0,47)
Others	186 (16,73)	53 (17,85)	32 (15,69)	102 (16,04)
Return (feedback) regarding performance				
Daily performance	782 (70,32)	228 (76,77)	142 (69,61)	436 (68,55)
Formal assessments	591 (53,15)	137 (46,13)	112 (54,9)	360 (56,6)
I do not provide returns	42 (3,78)	5 (1,68)	15 (7,35)	24 (3,77)

^aMultiple responses were allowed.

Source: Prepared by the authors, 2023.

Compared to primary healthcare (PHC), tertiary care showed a lower frequency of using video recording of consultations (RP 0.23, 95% CI 0.05 - 0.92, p 0.024) and portfolios (RP 0.27, 95% CI 0.20 - 0.36, p <0.001), but a higher frequency of using objective written exams (RP 1.67, 95% CI 1.23 - 2.25, p <0.001) and essay written exams (RP 1.71, 95% CI 1.18 - 2.49, p 0.003).

Having a career plan did not change the frequency with which assessment methods were used. Receiving an additional stipend showed a positive association with Mini-CEX (RP 1.91, 95% CI 1.29 - 2.82, p 0.001), video recording of consultations (RP 5.99, 95% CI 2.02 - 17.72, p <0.001), portfolios (RP 1.96, 95% CI 1.53 - 2.51, p <0.001), and 360° evaluation (RP 1.78, 95% CI 1.28 - 2.47, p 0.001).

In resident assessment, preceptors with residency training reported using the Mini-CEX tool more (RP 1.5, 95% CI 1.03 - 2.20, p 0.034) and objective written exams (RP 1.59, 95% CI 1.28 - 1.98, p <0.001) more frequently, and less frequently using oral assessment (RP 0.8, 95% CI 0.67 - 0.97, p 0.022), portfolios (RP 0.75, 95% CI 0.57 - 0.99, p 0.039), and standardized patients (RP 0.48, 95% CI 0.26 - 0.88, p 0.014) than preceptors without residency training. Having another postgraduate degree did not interfere with the use of most assessment methods, except for standardized patients, which were used more frequently by preceptors with specialization compared to those without postgraduate training (RP 2.53, 95% CI 1.18 - 5.41, p 0.012).

Preceptors with a master's degree (RP 0.26, 95% CI 0.09 - 0.78, p 0.009) and those receiving an additional stipend (RP 0.25, 95% CI 0.08 - 0.82, p 0.012) reported less frequently not providing feedback. Those who receive a stipend provide daily performance feedback more frequently (RP 1.12, 95% CI 1.04 - p 0.006). Preceptors with residency training reported more frequently providing feedback during formal assessments (RP 1.15, 95% CI 1.03 - 1.28, p 0.015).

Regarding the level of care, preceptors in tertiary care offer more feedback in formal evaluations (RP 1.23, 95% CI 1.06 - 1.41, p 0.003) and less frequently on daily performance (RP 0.89, 95% CI 0.82 - p 0.01) compared to primary healthcare (PHC). The frequency with which residents are evaluated by preceptors, the team, and users is described in Table 3.

Table 3 – Frequency with which residents are formally evaluated

Evaluation Frequency	By Preceptors n (%)	By Team n (%)	By Users n (%)
Never	21 (1,91)	270 (24,64)	492 (45,01)
Weekly	104 (9,45)	82 (7,48)	62 (5,67)
Fortnightly	27 (2,45)	16 (1,46)	8 (0,73)
Monthly	364 (33,09)	243 (22,17)	91 (8,33)
Quarterly	260 (23,64)	98 (8,93)	33 (3,02)
Semiannual	191 (17,36)	111 (10,13)	34 (3,11)
Yearly	31 (2,82)	37 (3,38)	13 (1,19)
Biennial	8 (0,73)	9 (0,82)	1 (0,09)
I do not know how to answer	94 (8,55)	230 (20,99)	359 (32,85)
Total	1100 (100)	1096 (100)	1093 (100)

Source: Prepared by the authors, 2023.

The results described focused on the differences between practices in PHC and tertiary care, as the results found in secondary care did not show statistical significance compared to the reference category (PHC).

Considering the number of teaching and assessment methods used by preceptors (Table 4), it is noted that the majority use five or more teaching methods, with a median of 5 (IQR 4 - 7). In contrast, most preceptors reported using only one or two assessment methods in the residency program, with a median of 2 (IQR 1 - 3).

Table 4 – Number of teaching and assessment methods used

Number of Teaching Methods n (%)		Number of Assessment Methods n (%)	
1	41 (3,69)	1	380 (34,17)
2	92 (8,27)	2	337 (30,3)
3	132 (11,87)	3	207 (18,61)
4	153 (13,76)	4	94 (8,45)
5 or more	686 (61,69)	5 or more	70 (6,29)
No response	8 (0,07)	No response	24 (2,16)
Total	1112 (100)	Total	1112 (100)

Source: Prepared by the authors, 2023.

Discussion

The study involved preceptors from all types of health residency programs (PR), covering almost all health areas and the three levels of care. These characteristics provide a comprehensive view of the educational methodologies used in training new specialists in various fields. It is essential to highlight that, in addition to the aspects that distinguish residency training from other modalities, the residencies themselves, at different levels of health care, differ from each other. These differences result from the characteristics of the services and the demands they meet, as well as the variations among professional classes (Feuerwerker, 2011). These aspects should be considered when analyzing pedagogical practices in different contexts, especially within residencies, which involve teaching and learning processes embedded in the daily practice of health services.

In tertiary care, a lower frequency of use of teaching methods involving group work, including team-based learning (TBL), and a higher frequency of use of lectures, which are further from the concept of active methodologies compared to other methodologies analyzed in the study, were observed. In the context of health residencies, especially multiprofessional ones, it is crucial to discuss the adoption of active learning methodologies (ALM). In a study by Arneman *et al.* (2018, p. 1641), preceptors identified active methodologies "as strategies for interprofessional teaching, as they provide residents the opportunity to position themselves and discuss their experiences."

Active learning methodologies (ALM) are present in health education actions that consider the professionals' protagonism in the teaching and learning process, "valuing the different ways in which they can be involved in this process so that they learn better, at their own pace, time, and style" (Bacich; Moran, 2018, p. 23). Unlike the university context, the use of active learning methodologies (ALM) in health residency training significantly contributes to integrating theory and practice within the healthcare service context. This use enhances the problematization of various daily situations and promotes student autonomy in constructing their learning. Thus, applying ALM in preceptorship becomes necessary, as this pedagogical approach values the resident's prior knowledge and experiences. This promotes "co-responsibility and proactivity in building new knowledge and learning aimed at transforming professional and institutional practices" (Chianca-Neves; Lauer-Leite; Priante, 2020, p. 4, our translation).

While having a career plan does not influence the use of teaching and assessment methods, receiving a supplemental stipend for preceptorship is positively associated with the

use of active teaching and learning methodologies, such as problem-based learning (PBL) and flipped classrooms. Moreover, stipend recipients showed higher rates of using less common assessment methods among the group, such as Mini-CEX, portfolio, and 360-degree evaluation. Although stipend receipt may be related to other factors that enhance preceptorship practice, such as specific pedagogical training and affiliation with educational institutions, specific remuneration for preceptorship appears to be an essential initiative for improving the training of new specialists.

The predominance of case discussion and direct observation as teaching and assessment methodologies in health residencies reflects the emphasis on supervised learning during residents' clinical practice. These practices are essential for integrating theory and practice, ensuring that assessment occurs directly during clinical performance. While case discussion is shared across different educational levels, pedagogical training of preceptors is essential to enhance this practice.

Studies, such as Barreiros *et al.* (2020), demonstrate that preceptors with specific preceptorship training conduct case discussions as an active methodology, focusing on residents' contributions and promoting teaching problematization. Furthermore, case discussions can be enriched by adopting structured methods like One-Minute Preceptor and SNAPPS, which "place the learner in a realistic setting and stimulate the formulation of systematic diagnostic reasoning, requiring the retrieval of previous knowledge" (Leitão *et al.*, 2021, p. 364).

Highly useful assessment methodologies in residency contexts, such as those involving simulation and assessment in clinical practice settings like Mini-CEX, are used by a minority of preceptors, while assessments predominantly focused on knowledge, such as written exams, are more common, especially in tertiary care. The Mini-CEX, as a direct observation tool of resident clinical competencies during patient encounters (Norcini *et al.*, 2003), with an important formative dimension through feedback (Romão *et al.*, 2020), should be encouraged in service-based education. It allows assessment across a wide range of clinical settings and patient problems (Norcini *et al.*, 2003), applicable to any field of specialization and various settings such as primary care units, outpatient clinics, wards, or emergency units (Romão *et al.*, 2020). These characteristics make Mini-CEX applicable across all levels of healthcare.

A significant portion of preceptors reported no evaluation of residents by the team or service users, alongside low utilization of 360-degree evaluation. This competency assessment methodology (Bastos *et al.*, 2019) allows residents to be evaluated by all individuals interacting

with them during their activities, focusing on aspects like leadership, communication, interpersonal skills, and negotiation (Lima, 2019).

Given the potential of this methodology in residencies, it is essential to encourage its use and promote ongoing training of preceptors to enhance its application (Bastos *et al.*, 2019). The low utilization of evaluations by healthcare service users may be attributed to the complexity of obtaining such evaluations, influenced by factors such as cultural, linguistic, personality issues, and literacy levels (Rodgers; Manifold, 2002).

Regular provision of feedback on the resident's progress and activities plays a crucial role in the practice of preceptors. According to Borges *et al.* (2014, p. 324, our translation), "effective feedback is one of the educational and evaluative strategies with the strongest evidence of efficacy in health professions education," highlighting its importance in residencies. Effective feedback not only enhances learning but also guides the residents toward achieving their goals (Chowdhury; Consultant, 2004). It is recommended not to overwhelm residents with a large volume of feedback at once and to provide feedback as close as possible to the evaluated event (Borges *et al.*, 2014; Chowdhury; Consultant, 2004). However, this practice has still not been adopted by nearly one-third of preceptors.

Additionally, almost half of the preceptors do not provide feedback from formal assessments, indicating that many do not perceive assessment as a learning opportunity. Furthermore, there is a minority that provides no feedback at all to residents. These data suggest that the ability to provide feedback, crucial for various assessment methodologies, needs to be strengthened in preceptor training.

Analyzing the diversity of teaching and assessment methodologies used by preceptors, there is a greater variety of teaching methods compared to the predominance of using only 1 or 2 assessment methods. While the use of diverse teaching methods aims to accommodate residents' different learning styles, the limitation in assessment methods may not be sufficient to address all competencies that need evaluation. "It is unlikely that any single assessment method alone will suffice to make decisions about learning and progression" (Bollela; Machado, 2010, p. 47, our translation).

Additionally, formal assessments in residency programs are guided by the corresponding educational project (EP), which may restrict the choice of assessment methods tailored to residents' competencies and individual learning needs, personalized by preceptors. Therefore, it is crucial to review these educational projects to align assessment methodologies with desired competencies and necessary learning outcomes. This includes providing

preceptors with a degree of autonomy in choosing assessment methods, as well as investing in their pedagogical training to enable them to select the most appropriate methodologies.

The study by Ribeiro *et al.* (2020) indicates that *Stricto Sensu* postgraduate education provides pedagogical learning, including teaching methodological strategies, which enhances the confidence of preceptors with this background in their teaching and learning processes. However, no significant differences were observed in the use of most teaching and assessment methodologies between preceptors with and without postgraduate education. The grouping of completed and ongoing courses in the same category may have influenced this result; however, specific education in the healthcare field is not expected to have a substantial impact on the teaching practice as a preceptor, as supported by the findings.

Residency training favors the use of less common methodologies within the studied group, such as journal clubs and Mini-CEX. However, it is crucial to consider including pedagogical skills development for preceptorship in residency programs. This aims to adequately prepare residents to become future preceptors, equipped not only with technical knowledge but also pedagogical skills, including mastery of tools that facilitate the teaching process (Carvalho Filho *et al.*, 2022).

Finally, this study's limitation includes the fact that the estimated associations were obtained through unadjusted analysis. Despite the high response rate, which significantly represents the students of the course in question, the research participants represent only a portion of preceptors, and the results may not be generalizable to all regions and residency programs nationwide.

Final considerations

This study investigated the teaching and assessment methodologies used by preceptors prior to a Preceptorship Specialization Course and identified factors associated with these practices, thus achieving its stated objective. Based on the findings, which highlight some gaps in the adoption of methods suitable for in-service teaching contexts and underscore the need for improvements in feedback practices within this environment, the ongoing importance of offering specific preceptorship training in Brazil is reaffirmed. The diversity and frequency of methodology usage across different levels of attention should be taken into account when planning these training programs.

Additionally, studies are needed to evaluate how graduates from existing preceptorship training courses utilize the learned teaching and assessment methodologies, as well as the effectiveness of these pedagogical practices in promoting learning within residency programs.

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