



Implementation of an assessment based on entrustable professional activities in a surgery medical residency program

Implementação de uma avaliação baseada em atividades profissionais confiáveis em um programa de residência médica em cirurgia

Implementación de una evaluación basada en actividades profesionales confiables en un programa de residencia médica en cirugía

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ABSTRACT

Objective: Analyze the implementation of an entrustable professional activity (EPA) based assessment in the general surgery residency program at a university hospital. **Methods:** This was an exploratory descriptive study. Information on the steps of implementing the new assessment method was obtained from institutional documents. The residents' performance was extracted from academic records. Perceptions of residents and preceptors of the EPA-based assessment were obtained with an online questionnaire at the end of the process. **Results:** Six residents and eight preceptors participated in the study. The preceptors assigned 110 ad-hoc entrustment decisions during the study period. A Clinical Competency Committee (CCC) assigned a statement of awarded responsibility to each resident for each EPA. The expected entrustment level was achieved by two first-year residents in the postoperative EPA and one second-year resident in the preoperative EPA. The main competency gap was knowledge of theoretical foundations and commitment to punctuality and attendance. The perception analysis showed residents and preceptors' broad acceptance of the new assessment method. The EPA-based assessment was perceived as easy to understand, fair, and valuable in promoting feedback and learning. **Conclusion:** Implementation of EPA-based assessment in a general surgery residency is feasible and it was widely accepted by residents and preceptors.

Keywords: Educational assessment, Entrustable professional activities, General surgery, Medical residency.

RESUMO

Objetivo: Analisar a implementação da avaliação baseada em atividades profissionais confiáveis (APC) no programa de residência em cirurgia geral de um hospital universitário. **Métodos:** Este foi um estudo descritivo exploratório. As informações sobre as etapas de implementação do novo método de avaliação foram obtidas a partir de documentos institucionais. O desempenho dos residentes foi extraído de registros acadêmicos. As percepções dos residentes e preceptores sobre a avaliação baseada em APC foram obtidas por meio de um questionário online ao final do processo. **Resultados:** Participaram do estudo seis residentes e oito preceptores. Os preceptores realizaram 110 avaliações ad hoc durante o período do estudo. Um Comitê de Competência Clínica (CCC) atribuiu um nível de atribuição de confiança a cada residente em cada APC. O nível de confiança esperado foi alcançado por dois residentes do primeiro ano na APC de pós-operatório e por um residente do segundo ano na APC de pré-operatório. A principal lacuna de competência foi o conhecimento dos fundamentos teóricos e o comprometimento com pontualidade e assiduidade. A análise de

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percepção mostrou uma ampla aceitação do novo método de avaliação por parte dos residentes e preceptores. A avaliação baseada em APC foi percebida como fácil de entender, justa e valiosa na promoção de feedback e aprendizado. **Conclusão:** A implementação da avaliação baseada em APC na residência em cirurgia geral é viável e foi amplamente aceita por residentes e preceptores.

Palavras-chave: Avaliação educacional, Atividades profissionais confiáveis, Cirurgia geral, Residência médica.

RESUMEN

Objetivo: Analizar la implementación de la evaluación basada en actividades profesionales confiables (APROC) en el programa de residencia en cirugía general de un hospital universitario. **Métodos:** Este fue un estudio descriptivo exploratorio. La información sobre los pasos de la implementación del nuevo método de evaluación se obtuvo de documentos institucionales. El desempeño de los residentes se extrajo de los registros académicos. Las percepciones de los residentes y preceptores sobre la evaluación basada en APROC se obtuvieron mediante un cuestionario en línea al final del proceso. **Resultados:** Participaron en el estudio seis residentes y ocho preceptores. Los preceptores asignaron 110 decisiones ad hoc de confianza durante el período del estudio. Un Comité de Competencia Clínica (CCC) asignó una declaración de responsabilidad otorgada a cada residente para cada APROC. El nivel de confianza esperado fue alcanzado por dos residentes de primer año en la APROC de postoperatorio y un residente de segundo año en la APROC de preoperatorio. La principal brecha de competencia fue el conocimiento de los fundamentos teóricos y el compromiso con la puntualidad y la asistencia. El análisis de la percepción mostró una amplia aceptación del nuevo método de evaluación por parte de los residentes y preceptores. La evaluación basada en APROC fue percibida como fácil de entender, justa y valiosa para promover la retroalimentación y el aprendizaje. **Conclusión:** La implementación de la evaluación basada en APROC en una residencia de cirugía general es factible y fue ampliamente aceptada por residentes y preceptores.

Palabras clave: Evaluación educativa, Actividades profesionales confiables, Cirugía general, Residencia médica.

INTRODUCTION

Medical knowledge in the surgical field has been evolving much faster than advancements in developing new methods for teaching and assessing surgery residents (STAHL CC, et al., 2020). Both preceptors and general surgery residents have expressed concern about the ability of the current surgical education model to prepare residents for unsupervised surgical practice (COLEMAN JJ, et al., 2013; WAGNER JP, et al., 2018). One challenge for preceptors is balancing the autonomy of medical residents with patient safety when defining the level of supervision a given resident requires (MOORE D, et al., 2017). In most residency programs, these entrustment decisions are made informally and based on poorly structured observations. In such a way, training certification is often based on time rather than on direct assessment of competency development (AMARE EM, et al., 2022).

Competency-based medical education is an educational framework aimed at developing knowledge, skills, and attitudes necessary for professional practice, organized around the needs of patients and society. Such a model enables student-centered learning with greater accountability, and the curriculum needs to be flexible to accommodate the different needs of the learner (FRANK J, et al., 2010). Since the focus is on competency development, the learner must undergo formative evaluations based on direct performance observation. Entrustable Professional Activities (EPAs) were introduced in medical education in 2005 by Olle Ten Cate, and their use in assessment and curriculum design has progressively increased in residency training and undergraduate medical education (TEN CATE O, 2019). The EPAs represent professional practice units that constitute physicians' core activities related to patient care (TEN CATE O, 2005).

The decision to allow the learners to perform a given EPA without supervision requires their direct observation in an authentic setting, usually on multiple occasions and by multiple preceptors (TEN CATE O, 2019). There are two types of entrustment decisions: ad hoc and summative. Ad hoc entrustment decisions are taken routinely in the clinical setting when the supervising physician assigns an autonomy level to the learners after directly observing them performing a core professional activity. On the other hand, summative

attribution decisions are used for certification and, therefore, must be based on several direct, longitudinal assessments made by different supervisors and endorsed by a committee (TEN CATE O, 2015). This clinical competency committee (CCC) analyzes a synthesis of all assessments received by the learner during a specified training period. The CCC then assigns a level of autonomy for each learner in each EPA (STAHL CC, et al., 2020).

There are five levels of supervision, as proposed by Ten Cate O (2019): Level 1: the learner is allowed to be present and observe, not to enact an EPA; Level 2: the learner is allowed to execute the EPA with direct, pro-active supervision, present in the room; Level 3: the learner is allowed to carry out the EPA without a supervisor in the room, but quickly available if needed, i.e., with indirect, reactive, supervision; Level 4: the learner is allowed to work unsupervised; and Level 5: the learner is allowed to provide supervision to more junior learners. In addition to providing a more objective way of awarding responsibility to the learner, using EPAs increases the number of opportunities for feedback (MOORE D, et al., 2017).

The American Board of Surgery began exploring the usefulness of entrusted professional activities as a framework to support competency-based education for general surgery residents in 2016. Stahl CC, et al. (2020) described in their work the process of implementing EPAs in the general surgery residency at the University of Wisconsin. Despite the barriers associated with lack of time to conduct assessments, lack of staff training, difficulty incorporating the model into the work routine, or simply forgetting the assessments on a busy day, the authors reported successfully integrating the EPAs into the institution's assessment framework. After the initial challenge of creating a set of EPAs that would represent the entire spectrum of professional practice in general surgery, the EPA-based assessment was gradually incorporated into different institutions (LINDEMAN B, et al., 2021; BRASEL KJ, et al., 2023).

The implementation of competency-based curricula in medical residency programs has progressed slowly in Brazil, particularly outside major urban centers. This study aims to contribute to the growth of knowledge on the use of EPAs in general surgery residency training, which could be beneficial not only in enhancing our residency program but also in serving as a model for other institutions with similar contexts. We aimed to analyze residents' and preceptors' perceptions about this initial process of using EPA-based assessment in a general surgery medical residency program.

MÉTODOS

Study design

This is a descriptive study of implementing a competency-based assessment model using EPAs in the general surgery medical residency program at the Alzira Velano University Hospital. The study describes the implementation process, the number of assessments each resident received, the level of entrustment achieved in each EPA, and the main competency gaps. At the end of the process, the perception of residents and preceptors of the new assessment method was analyzed. The study was conducted between May and July 2023. The study protocol was approved by the Ethics Research Committee of Unifenas (CAAE 6.062.180) and all participants signed informed consent.

Setting

The 3-year surgery medical residency program at the Alzira Velano University Hospital has two residents per year. Before the implementation of EPA-based assessment, there were no longitudinal assessments of competency development. Grades were assigned based on a general perception of performance in practice and the scores from cognitive exams, and residents were certified after completing the training hours required by the legislation (CNRM, 1979).

In 2022, our institution began discussing implementing a competency-based evaluation system using EPAs. Three EPAs, "Preoperative care," "Postoperative care," and "Small surgical procedures," were chosen to be used initially in general surgery residency training. The EPAs were based on those created by Santa Casa de Belo Horizonte for its surgical training program (DELBONE RM e MOURA AS, 2022). At the beginning of 2023, the residents and preceptors received specific training on EPA-based assessments, details of the EPAs used, and how to electronically register the assessments. From May to July 2023, residents have been

assessed based on direct observation by preceptors during their usual practice. Each ad hoc decision comprised an entrustment level and written feedback.

At the end of July 2023, the CCC analyzed the assessments and assigned an autonomy level for each resident for the three EPAs. A written report was provided to the residents, with the assigned autonomy level of performance for each EPA pointing out major strengths and gaps. The level of entrustment required for promotion varied according to the training year. It was level 3 (indirect supervision) for post-graduate year one (PGY-1), level four (unsupervised practice) for PGY-2, and level five (might teach novice learners) for PGY-3. Noteworthy, even residents who were entrusted to practice unsupervised continued to receive supervision as established by national legislation (CNRM, 1978).

Procedures

Data on residents' performance was extracted from an anonymous database from the Clinical Competence Committee. Perceptions of residents and preceptors were assessed by an online questionnaire with items in a 5-point Likert scale. The questionnaire was adapted from a previous implementation study (FERREIRA MLM, 2022).

Data analysis

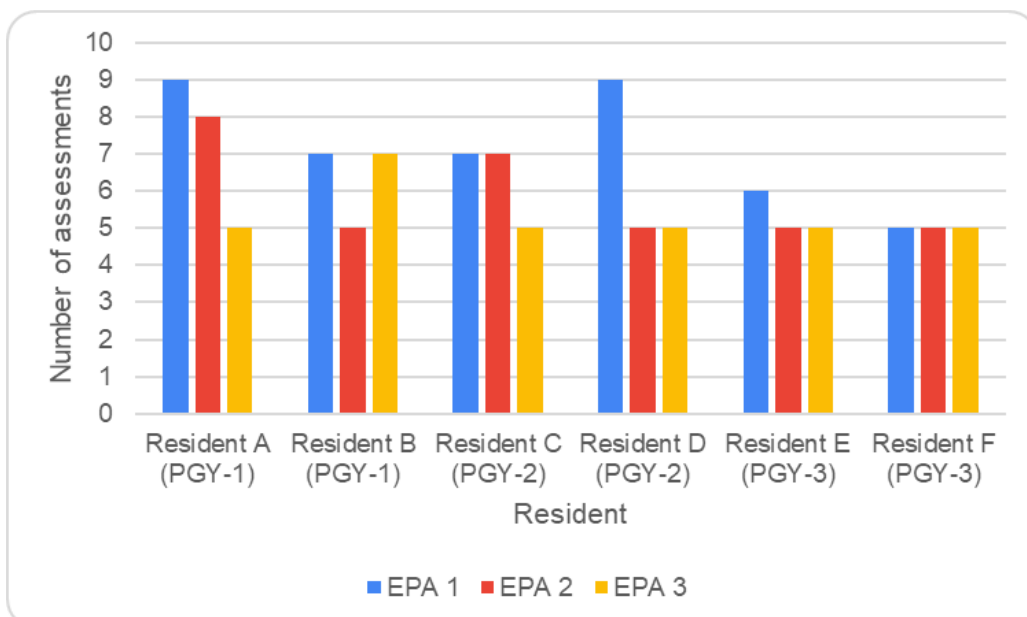
A descriptive analysis of each resident's number of evaluations, the level of entrustment achieved in each EPA, and the competency gaps of the residents were carried out. A descriptive analysis of residents' and preceptors' perceptions regarding the evaluation method based on EPAs was also performed.

RESULTS

Resident Assessments

Six general surgery residents and eight preceptors participated in the study. There was a predominance of female residents (66.7%), with a median age of 27 years. Four of the residents graduated from private medical schools, while two graduated from public medical schools. Most preceptors were male (87.5%), with a median age of 34.5 years, a median time since graduation in general surgery residency of 4.9 years and a median experience time in preceptorship of 4 years.

Figure 1 - Number of EPA assessments per resident.

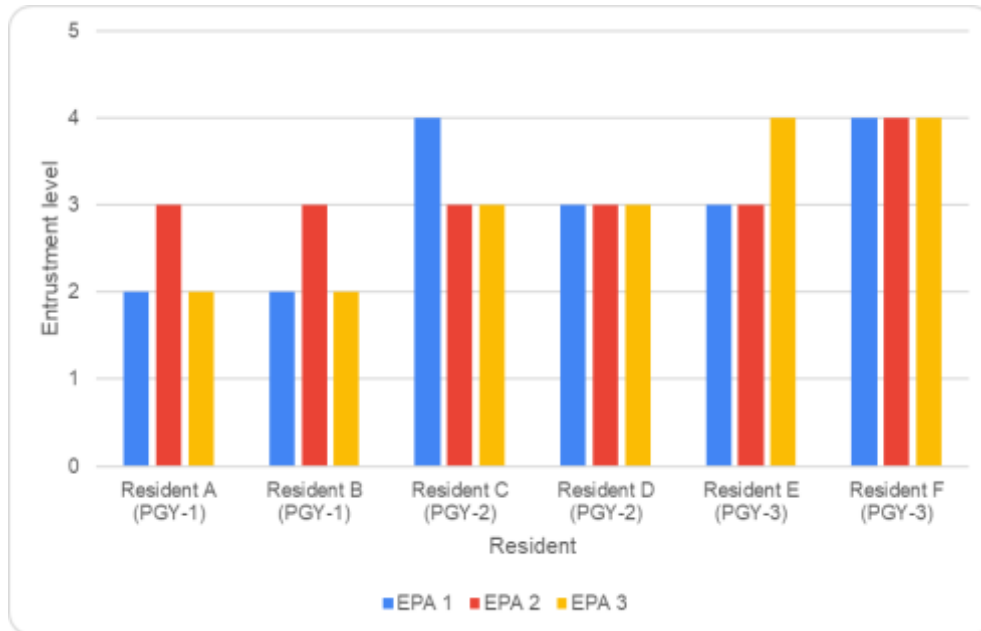


EPA: Entrustable Professional Activity. **PGY-1:** post-graduate year 1; **PGY-2:** post-graduate year 2; **PGY-3:** post-graduate year 3

Source: Neto PV, et al., 2025.

At the end of the evaluation period, the clinical competence committee defined the entrustment level in each EPA for each resident. Figure 2 shows the distribution of the levels of entrustment assigned by the CCC, stratified by EPA and by medical resident.

Figure 2 - Distribution of entrustment levels assigned to residents by the CCC, stratified by EPA and by resident.



EPA: Entrustable Professional Activity. **PGY-1:** post-graduate year 1; **PGY-2:** post-graduate year 2; **PGY-3:** post-graduate year 3. **Source:** Neto PV, et al., 2025.

Table 1 describes the main skills gaps by domains in the three assessed EPAs, followed by the most cited terms in the feedback.

Table 1 - Competency domains and main competence gaps.

EPA	Competency domain	Main Competency Gaps
EPA 1 – Preoperative	-Technical excellence	-Knowledge about risks and expected outcomes (including surgical complications) - Ability to investigate risk factors or aggravating factors of diseases - Assigning differential diagnoses
	- Professionalism	- Commitment to be on time for work.
EPA 2 – Postoperative	-Technical excellence	-Knowledge to optimize prescription -Ability to investigate risk factors or aggravating factors of diseases
	-Professionalism	- Commitment to punctuality and attendance
EPA 3 – Minor procedures	-Technical excellence	- Knowledge of the description of the surgical technique -Ability to master the surgical technique
	-Self-management of learning	-Attitude of seeking knowledge autonomously
	-Professionalism	-Lack of proximity to cases
	-Leadership	-Lack of confidence during procedures

EPA: Entrustable Professional Activity.
Source: Neto PV, et al., 2025.

Resident's and preceptor's perceptions

Most of the study participants had never had contact with EPAs – no resident and only one preceptor (12.5%) had ever worked with the method. The perception assessment questionnaires showed that all participants agreed or strongly agreed that they were properly introduced to the new assessment framework and that the steps of the implementation process were clear. However, 3 of the 8 preceptors reported difficulty assessing the residents. All preceptors and residents agreed or strongly agreed that the use of EPAs was a good way of assessing residents' performance and reflected actual performance.

Most residents (83.3%) and preceptors (87.5%) agreed or strongly agreed with the entrustment level assigned by the CCC. All residents agreed or strongly agreed that EPAs were useful for learning, providing feedback, identifying competency gaps, and planning future educational experiences.

While all the preceptors reported directly observing the residents during the consultations, 50% of the residents were neutral regarding this statement. Six out of eight preceptors reported providing feedback throughout the rotations. Half of the residents preferred the evaluation system using EPAs over the previous assessment method, while the other half had no opinion about it.

When providing final comments on the implementation process, the preceptors highlighted that the staff still has little experience with the evaluation method. One preceptor, which was also a member of the CCC, emphasized the risk of administrative overload. On the other hand, having pre-defined criteria to evaluate residents was pointed out as an advantage.

The residents pointed out feedback as the central positive aspect of the new assessment method. In contrast, the barriers in their opinion were the subjectivity of the CCC when defining the level of entrustment, the diversity of contexts even within a single EPA (with varying complexity), and the frequent lack of feedback immediately after the assessment. The complete results of the questionnaires assessing the perception of residents and preceptors can be seen in **Tables 2** and **3**.

Table 2 - Residents' perception of EPA-based assessment.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I was introduced to the new evaluation system before I was submitted to it.	0	0	0	0	100%
The EPA evaluation system is a good way to evaluate my overall performance.	0	0	0	83,3%	16,7%
The level of confidence assigned to me by the CCC corresponds to my self-perception.	0	16,7%	0	66,6%	16,7%
The assessment method was easy to understand.	0	0	0	16,7%	83,3%
The preceptors directly observed my practice before assessing me.	0	0	50%	50%	0
The EPAs were helpful for my learning.	0	0	0	50%	50%
The EPA-based assessment helped promote feedback.	0	0	0	33,3%	66,7%
The CCC report helped identify gaps in my competency development.	0	0	0	50%	50%
The CCC report contributed to planning future activities necessary for my development.	0	0	0	50%	50%

EPA: Entrustable Professional Activity. **CCC:** Clinical Competence Committee.

Source: Neto PV, et al., 2025.

Table 3 - Preceptors' Perceptions of EPA-based assessment.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do you consider your training adequate to apply the new evaluation system?	0	0	0	37,5%	62,5%
In your opinion, did the evaluation process take place with fairness?	0	0	0	62,5%	37,5 %
Was the evaluation process clear to you?	0	0	0	37,5%	62,5%
Did you observe the residents when they performed their consultations before performing the evaluation?	0	0	0	25%	75%
Did you provide feedback throughout the internship?	0	0	25%	62,5%	12,5%
Did you provide feedback at the end of the internship?	12,5%	12,5%	12,5%	50%	12,5%
Based on your previous experiences, did the evaluation system reflect the resident's learning during the internship?	0	0	0	37,5%	62,5%
Did you agree with the grade assigned by the CCC in the final report?	0	0	12,5%	25%	62,5%
Did you have any difficulty assessing it as proposed?	37,5%	25%	0	37,5%	0

EPA: Entrustable Professional Activity. **CCC:** Clinical Competence Committee.

Source: Neto PV, et al., 2025.

DISCUSSION

Implementing EPA-based assessment in a general surgery residency program presents great challenges. The work overload already present in surgery training requires a strong commitment from the team of preceptors and residents to implement changes in the assessment framework (STAHL CC, et al., 2020). Despite these difficulties, our results demonstrated a broad acceptance among preceptors and residents of the new assessment method.

One of the factors that may have contributed to the good acceptance among preceptors was the ease of registering the daily assessments. Using an electronic form that preceptors could access from their mobile phones ensured speed and agility. Duggan N, et al. (2021) showed that preceptors enjoyed using mobile technology to assess residents' performance. Easy registration of the daily assessments is crucial since documentation of the learner's progress is essential to their educational development. It allows early recognition by the residents of their strengths and competency gaps and provides the necessary documentation for the certification decisions made at the end of the process by competency committees (PETERS H, et al., 2017).

Good acceptance of the new evaluation method among residents was associated mainly with the increase in feedback opportunities. All residents agreed or strongly agreed that the EPA-based assessment helped promote feedback. Feedback can be offered in different formats and is essential for competency development in surgical education (EL BOGHDADY M e ALIJANI A, 2016). Appropriate feedback has been associated with learning and is even more effective when it is descriptive, non-judgmental, based on observable behaviors, and limited to modifiable factors (GORDON J, 2003). Feedback should ideally be conducted as a dialogue between the preceptor and the resident, who work as allies towards a common goal. It can be conducted informally in the day-to-day work or formally as part of an evaluation process. The feedback should be conducted at a place and at a suitable time for both the preceptor and the resident, preferably soon after the assessment occurred (CHOWDHURY R e KALU G, 2004).

Noteworthy, despite being pointed out by the residents as a major strength of the new assessment method, we observed that the written feedback provided in the daily assessments was often concise and not very helpful. In addition, this feedback was often nonspecific, not correlated to the competence gaps highlighted in

the assessment form, and did not suggest remediation strategies. Therefore, we feel that feedback can still be substantially improved with further educational development of the preceptors. One of the pillars of implementing competency-based medical education is the need for continuous professional development of the preceptors. Such training should be tailored to the needs of the faculty team (MULDER H, et al., 2010).

There was disagreement between the perceptions of residents and preceptors about the statement that assessments were made after direct observation. While all preceptors agreed or strongly agreed with the statement, only 50% of the residents agreed. These findings point to the need for preceptors to offer feedback immediately or after a short period of time since the observation. In addition to the importance of feedback itself, its provision soon after the observation could also make it clear to the residents that his performance was directly observed.

Another critical aspect to be discussed is the performance of the clinical competence committee. The CCC provides summative assessment, which is important for certification. The literature recommends that the CCC should be comprised of at least three preceptors, who may or may not include the program coordinator (FRENCH JC, et al., 2014).

The committee comprised four preceptors in our service, including the program coordinator. There was some perception by the residents that the process was subjective, but this qualitative nature is intrinsic to EPA-based assessment. A more precise decision is based on many observations by different assessors that provide a broader view of the residents' performance (TEN CATE O, 2015).

Comparing the expected confidence levels with the levels assigned by the CCC, we noticed that neither of the residents achieved the expected level of autonomy in all three EPAs. Noteworthy, the assessment was conducted in the first months of the year, and residents still had at least six months to achieve the expected level. At this point, remediation strategies are worth discussing, which consist of measures to support learners with difficulties in achieving sufficient competence (CHOU CL, et al, 2019).

Bhatti NI, et al. (2016) point out that in their study, 2.0% of residents needed remediation. Early identification and remediation of residents is essential to optimize educational resources and reduce negative impacts on patient safety and quality of care (PIRIE J, et al., 2020). Regarding the remediation process, one should try to detect its need early, collecting relevant data from multiple sources and proactively intervening. The residents that need remediation must be followed longitudinally, receiving frequent and high-quality feedback. One should avoid limiting the remediation to increase training time, repeating the experiences already conducted, providing vague and non-specific counseling, or simply teaching enough to pass the tests (CHOU CL, et al., 2019).

Another aspect of using EPAs that should be carefully evaluated is the risk of administrative overload for the staff, as noted by one of the preceptors who was also a member of the CCC. Conducting assessments in the practice setting is time-consuming and virtually non-disruptive to workflow. However, data analysis, CCC, and feedback take much longer than traditional evaluation, which can overload and discourage the team. One possibility to solve this issue would be to allocate a specific workload so that the preceptors directly involved can dedicate themselves to analyzing the evaluations.

Exploring the inclusion of third-year residents as evaluators is a possibility that will be discussed in the next steps of using EPAs in our institution. First-year residents may feel more comfortable receiving evaluations from their final-year colleagues since they spend much time together in medical residency activities, possibly have more significant social interaction, and may have a closer relationship than the one established with preceptors (GUPTA A, et al., 2019).

Our work has limitations. One limitation was the use of a small set of EPAs. In this initial implementation process we opted for a gradual start, with a limited number and using general activities to facilitate its use, smooth the workload associated with the analysis of the evaluations, and favor the acceptance of the methodology at this first moment, as carried out by the American Board of Surgery in its pilot study of the introduction of EPAs in different general surgery residencies in the United States from 2018 onwards (LINDEMAN B, et al., 2021; BRASEL KJ, et al., 2023).

Another limitation was the short period of assessment which limited the number of evaluations obtained. There are few references in the literature regarding the minimum number of EPA evaluations per resident that would make the evaluation representative. Brasel KJ, et al. (2023) stated in a recent study that it is not possible to determine the appropriate number of assessments in an EPA necessary to define the confidence level of a given resident, and this number is likely to be different for different EPAs and possibly for different levels of summative attribution. The document on EPAs of the Royal College of Physicians and Surgeons of Canada guides in this regard, suggesting the number of observations needed for each activity. This number varies for the different EPAs according to their prevalence and complexity. In our study, the authors defined a minimum of five evaluations for each EPA per resident. Finally, the study had a limited number of residents and preceptors. Despite the limited period of time and number of participants, we believe that our reality illustrates the scenario of numerous services outside the large urban centers in Brazil and can serve as a reference for other institutions that want to implement a competency-based evaluation model.

CONCLUSION

The use of Entrustable Professional Activities (EPAs) as an assessment tool enabled the estimation of the level of autonomy acquired and the identification of the main competency gaps among residents during the study period. The competency-based assessment strategy was widely accepted by both residents and preceptors in our institution. In addition to providing a more comprehensive evaluation of residents, it facilitates the delivery of more consistent and precise feedback, which can possibly be valuable in guiding trainees through the path toward autonomous surgical practice. The full implementation of an EPA-based program is a long-term process that requires commitment from the team and the institution.

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