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# Entrustable professional activities, emergency medicine and medical education: a systematic review

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## Abstract

**Introduction** Entrustable professional activities (EPAs) are one way to assess competencies, and are designed to bridge the gap between theoretical competencies and real world clinical practice.

**Aims** This was a systematic review which aims to answer the question: "Which EPAs related to Emergency Medicine are described for medical schools?".

**Methods** We included original qualitative, interventional and observational studies (cross-sectional, case-control, and cohort studies) that described EPAs relevant to Emergency Medicine for Medical School. The search strategy was created using a combination of keywords and standardized index terms related to EPAs and Emergency Medicine.

**Results** The search strategy identified 991 citations. After screening the titles and abstracts, we identified 85 potentially relevant studies. After the full-text review, a total of 11 reports met the criteria for inclusion.

**Conclusion** Recognizing a patient requiring urgent or emergent care and initiating evaluation and management is the most common EPA related to Emergency Medicine described at Medical Schools. Use of EPAs is associated with increased student satisfaction and improved competences. However, there is a lack of undergraduate EM specific EPAs being systematically developed and published, and this should be an area to be explored in future studies.

**Keywords** Medicine emergency, Entrustable professional activities, Medical school

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## Background

Although Emergency Medicine (EM) has been practiced since ancient times, its recognition has only recently occurred. In this sense, this specialty aims to diagnose and treat patients who require medical care due to an unforeseen condition. In parallel, the Entrustable Professional Activities (EPAs) are a place where knowledge and skills learned during graduation meet professional practice, with the aim to help professors outline the most fundamental pillars to be learned by students and really prepare them for clinical practice post graduation. The creation of EPAs in graduate training has been seen in a lot of specialties, notably in EM; these teaching tools greatly assist in the dissemination of knowledge of an eminently practical specialty. However, a structured EM clerkship to graduate scenarios still remains an area of slow growth internationally, resulting in potential gaps and variations of incoming residents and young physicians. For that, this study aims to identify EPAs described for medical schools that are relevant to EM.

## Introduction

For several years, medical education has internationally moved to the use of competence based frameworks (CBME), in order to propose a precision education model aimed at realigning medical education and patients' needs. [1–3] More recent evolution of this direction is the incorporation of entrustable professional activities (EPAs), designed to bridge the gap between the theoretical competencies of CBME and real world clinical practice. [1] EPAs provide a holistic approach to expressing curricular outcomes required to perform specific workplace tasks. [1] This approach of training is theorized to decrease the number of trainees that do not demonstrate clinical competence despite excelling in theoretical and practical exams. [2]

The inclusion of EPAs into graduate medical training programs has been seen in internal medicine, family medicine, anesthesia, and emergency medicine (EM). [3–6] EM has experienced unprecedented worldwide growth in graduate medical education, and programs are incorporating EM experiences in their curricula. [7, 8] Nonetheless, the addition of mandatory, structured EM clerkships in graduation still remains an area of slow growth internationally. [9] A similar situation could result in gaps in EM learning at the undergraduate level, as newly graduated physicians do not meet the expectations required by their level of capacitation. [9]

At medical school, EPAs can be used by supervisors to contextualize competencies in real world practice, to meaningfully assess the progress and capabilities of new graduates, and provide clearer expectations for students regarding the clinical tasks they will be required to perform after graduation [1]. Further, EPAs also offer curriculum developers and teachers tangible goals for aligning teaching and training with clinical practice, across the continuum from undergraduate to graduate [1]. This study aims to identify EPAs described for medical school that are relevant to EM.

## Methods

### Study design

This was a systematic review which aims to answer the question: "Which EPAs related to Emergency Medicine are described for medical undergraduate training?" This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. [10]

### Eligibility criteria

We included original qualitative, interventional and observational studies (cross-sectional, case-control, and cohort studies) that evaluated, exclusively, EPAs about EM applied to undergraduate scenarios, and with undergraduate medical students. Only complete and published studies were included. Conference abstracts, case reports, narrative reviews, and opinion articles were considered for inclusion, and there was no restriction in terms of language or the year of publication.

### Search strategy

A strategy for a literature search was developed and executed by study investigators. The search strategy was created using a combination of keywords and standardized index terms related to EPAs and Emergency Medicine. The search utilized descriptors with boolean operators (EPA OR Entrustable Professional Activities) AND Emergency Medicine. Articles that did not applied EPAs to undergraduate scenarios and/or did not were proposed to undergraduate medical students, were excluded.

The search was run in August 2023 and updated in June 2024 in MEDLINE, Scielo, Web of Science, Scopus databases, and Academic Emergency Medicine: Education and Training. Articles published till 1th July 2024 were evaluated. Reference lists of relevant papers and previous narrative reviews were manually searched in order to identify citations that did not appear in the main searches.

### Study selection and data extraction

In phase 1, 4 investigators independently screened all titles and abstracts for eligibility. In phase 2, studies considered potentially relevant were retrieved as full text and independently assessed for eligibility. The investigators were not blinded to the authors, journals, or results of the studies. Any disagreement was resolved by consensus in a discussion between the four review authors with a fifth reviewer. Rayyan was used as a tool to facilitate and organize the review process. [11]

Pertinent data were independently extracted and in duplicate for all the studies using a standardized, predefined extraction form. The extracted data included country, study design, journal, impact factor, inclusion and exclusion criteria.

## Results

### Study selection

The search strategy identified 991 citations (Fig. 1). After screening the titles and abstracts, we identified 85 potentially relevant studies, which may be found by the spreadsheet link that follows: "https://docs.google.com/spreadsheets/d/1UvSk174yLm6XFov8XcmDebJFOo8ww5tGhme6e2qx0Yg/edit?gid=0#gid=0". After the full-text review, a total of 11 reports met the criteria for inclusion.

### Study characteristics

The main characteristics of the included studies are summarized in Table 1. Most studies were published in 2016 and developed in the United States of America (USA). The populations involved a range from 9 to 780 medical students.

### EM EPAs for undergraduates

The articles cited from 1 to 46 EPAs during their development. The studies, EPAs and their conclusions are summarized in Table 2.

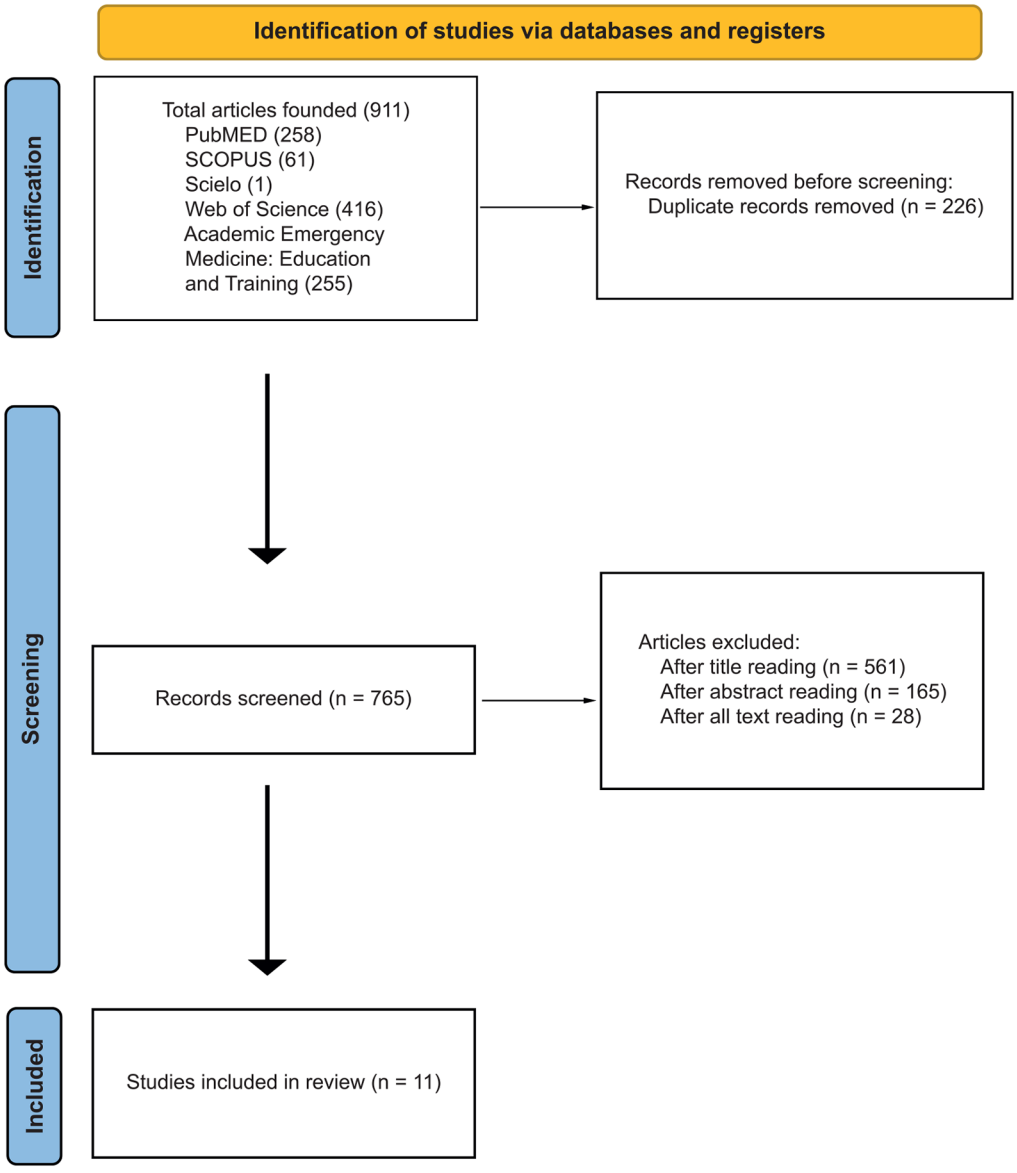


**Fig. 1** Study selection flow for the systematic review

**Table 1** Title, authors, years of publication, journal, qualis and the impact factor of included articles

| Study | Title | Authors and year of publication | Country | Journal | Qualis | Impact factor |
|---|---|---|---|---|---|---|
| S1 [7] | A suggested emergency medicine boot camp curriculum for medical students based on the mapping of Core Entrustable Professional Activities to Emergency Medicine Level 1 milestones | Lamba S., et al., 2016 | United States of America | Advances in Medical Education and Practice | A1 | 2.4 |
| S2 [12] | Bridging the gap: a five stage approach for developing specialty-specific entrustable professional activities | Kwan, J. et al., 2016 | Austrália | BMC Medical Education | A2 | 3.263 |
| S3 [13] | Entrustable Professional Activity 10: Recognizing the Acutely Ill Patient—A Delirium Simulated Case for Students in Emergency Medicine | Dora-Laskey, A. et al., 2016 | United States of America | The Journal of teaching and learning Resources | | 1.28 |
| S4 [14] | Entrustable Professional Activity 10: Case Simulation and Assessment—STEMI With Cardiac Arrest | Kman N. E. et al., 2016 | United States of America | The Journal of teaching and learning Resources | ' | 1.28 |
| S5 [15] | Connecting undergraduate and postgraduate medical education through an elective EPA-based transitional year in acute care: an early project report | Jonker, G. et al., 2017 | Netherlands | GMS Journal for Medical Education | A3 | 0.335 |
| S6 [16] | Development of an Assessment for Entrustable Professional Activity (EPA) 10: Emergent Patient Management | Thompson, L. R. et al., 2017 | United States of America | Western Journal of Emergency Medicine | A1 | 3.985 |
| S7 [17] | Ultrasound for Volume Assessment in Patients with Shock: Effectiveness of an Educational Intervention for Fourth-year Medical Students | Kukulski P. et al., 2018 | United States of America | Cureus | C | 2.4 |
| S8 [18] | Educational priorities of students in the entrustable professional activity era. | Strowd, R. E. et al., 2018 | United States of America | The clinical teacher | A2 | 1.5 |
| S9 [19] | Simulation as a Platform for Development of Entrustable Professional Activities: A Modular, Longitudinal Approach | Herrigel, D. J. et al., 2020 | United States of America | Cereus | C | 2.4 |
| S10 [20] | An analysis of core EPAs reveals a gap between curricular expectations and medical school graduates' self-perceived level of competence | Marty A., et al., 2021 | Switzerland | BMC Medical Education | A2 | 3.263 |
| S11 [21] | Filling the Core EPA 10 assessment void: A framework for individual assessment of Core Entrustable professional activity 10 competencies in medical students | Miller, D. T. et al., 2022 | United States of America | AEM Education and Training | A1 | 1.621 |

## Limitations

Limitations of this review relate mainly to the characteristics of the included studies. First, data availability was heterogeneous, and we included studies of different methodologies, from articles that described the creation of a scenario for the application of one EPA [13, 14, 17], articles that described a course's curriculum [7, 12, 15, 16, 19, 21] and articles that described the self-assessment for executing EPAs [18, 20]. Additionally, most studies reported medical students in different years of graduation [7, 13–19, 21], however we chose to include two articles which analyzed newly graduated junior doctors [12–20] because we found similarities between the supervised first year of graduated doctors and the final years of medical school in some countries.

EPAs are tools essentially linked to undergraduate teaching; while Emergency medicine, in turn, is a specialty. Therefore, in view of this differentiation, Emergency medicine may not reflect what is learned during undergraduate studies, which limits our study.

A possible methodology for searching and developing the present study could have been to search for the Milestones of the Accreditation Council for Graduate Medical Education and carry out their comparison with each EPA found. As we aim to propose a more comprehensive search, we performed the search according to previously described methods.

## Discussion

In this systematic review, we identified EPAs described for medical school that are relevant to Emergency Medicine.

EPAs have been described as units of professional practice, defined as tasks or responsibilities to be entrusted to a trainee once sufficient specific competence is reached to allow for unsupervised practice. [24] They are independently executable within a time frame and observable and measurable in the process and outcome and therefore can be used to make entrustment decisions. [24]

Even though many EPAs have been created for residency programs, as they would be the training stages for

**Table 2** Population, study type, aims, EPAs, mainly results and conclusions

| Study | Population (*n*) | Study Type | Aims | EPAs | Mainly Results | Conclusions |
|---|---|---|---|---|---|---|
| S1 | 9 | Qualitative study | To identify core procedural skills and areas of critical importance for the clinical practice of EM and to describe an EM procedure bootcamp. | EPA 10 from Association of American Medical College's (AAMC) [22]: recognize a patient requiring urgent or emergent care and initiate evaluation and management. | All participants reported an increase of knowledge and confidence in the topics covered and overall satisfaction with the simulation experience. | To do a bootcamp using EPAs identifies educational gaps for graduating medical students. Gaps include procedural skills such as airway management, procedural sedation, pain management, care of wounds, suturing, and emergency ultrasound, as well as ED-specific skills related to patient reassessment, observation, and disposition. |
| S2 | 12 | Qualitative study | To describe a new approach to develop EPAs in emergency medicine. | Managing adult patients with acute chest pain and Managing elderly patients following a fall | Describe a comprehensive five stage approach to develop two EPAs using depth focus groups and individual interviews. | The approach described in this paper was used successfully to develop two specialty-specific EPAs in emergency medicine along with a three level entrustment scale. |
| S3 | 13 | Qualitative study | To recognize a septic patient with delirium who requires emergent care, and initiate the evaluation and management of a critically ill patient. | EPA 10 from AAMC [22]: recognize a patient requiring urgent or emergent care and initiate evaluation and management. | Students successfully completed each of the five critical actions without prompting. No specific areas of difficulty were identified during the debriefing following this session | Application of this simulated practice can more successfully prepare undergraduate students to perform more efficiently during their professional lives. |
| S4 | 114 | Qualitative study | To recognize a severity of a patient with an ST segment elevation myocardial infarction, apply basic and advanced life support, and engage team members required for immediate response, continued decision making, and necessary follow-up to optimize patient outcomes | EPA 10 from AAMC [22]: recognize a patient requiring urgent or emergent care and initiate evaluation and management. | Authors describe the scenario and 3 comments from students who praised the simulation and debriefing. | It is expected that the model brought by the study will help the curricular construction of different centers and allow them to train qualified professionals who are aware of the most important practices to be adopted during their professional practice. |
| S5 | 47 | Qualitative study | To describe the design of a multidisciplinary dedicated transitional year (DTY), a final year at Medical School, focused on the recognition and initial treatment of critically ill patients | Recognition and initial treatment of patients with vital instability, Evaluation of patients with respiratory insufficiency, and Evaluation of patients with circulatory insufficiency | The authors believe that theme-orientation and the learning objectives provide coherence in a year consisting of elective rotations. They said that the design and implementation of DTY has been a laborious, yet satisfactory, process. Considerable time and effort were required to collaboratively develop and describe the three EPAs, transcending traditional specialty boundaries, with faculty from five disciplines. | This multidisciplinary DTY using EPAs aims to final year's medical students with profile-specific competence in acute care. It prepares for residency in a range of specialties. |

**Table 2** (continued)

| Study | Population (*n*) | Study Type | Aims | EPAs | Mainly Results | Conclusions |
|---|---|---|---|---|---|---|
| S6 | 114 | Qualitative study | To design realistics case-scenarios representing patients in need of emergent care | EPA 10 from AAMC [22]: recognize a patient requiring urgent or emergent care and initiate evaluation and management.<br>Authors developed 5 scenarios: (1) Chest pain: unstable atrial fibrillation (Afib); (2) Abdominal pain: ruptured ectopic pregnancy (REP); (3) Confusion and fever: sepsis (SEP); (4) Headache: subarachnoid hemorrhage (SAH); and (5) Trauma and shortness of breath: trauma-related tension pneumothorax (PTX). | Three critical actions were common across all of the cases: recognizing abnormal vital signs, asking for help when needed, and determining patient disposition. Almost 87% of the students were rated as having reached ad-hoc entrustment | High-fidelity simulation has shown promise in effectively assessing medical students' ability to care for emergent patients. |
| S7 | 51 | Analytic experimental study | To determine the effectiveness of an educational intervention in teaching fourth-year medical students how to use ultrasound measurements of the inferior vena cava (IVC) and echocardiography for volume assessment in patients presenting with shock. | EPA 10 from AAMC [22]: recognize a patient requiring urgent or emergent care and initiate evaluation and management. | The students' knowledge increased significantly after the training and the satisfaction survey showed 97.6% of students felt the session was worthwhile, 96.4% would recommend it to other students, and 83.1% felt it taught new information | The educational intervention successfully improved knowledge regarding volume assessment using echocardiogram and ultrasound measurements of the inferior vena cava (IVC). Students highly appreciated the course and found it offered unique information not commonly covered in medical school. This curriculum aligns with the AAMC EPA 10, better preparing students to handle cases of hypotension and potentially enhancing the overall value of the medical school curriculum. |
| S8 | 113 | Analytic observational cross-sectional study | To describe how the views of senior medical students at the time of the pre-internship transition compare with: (1) national guidelines; (2) resident expectations; and (3) institutional objectives. | EPAs from AAMC [22]: 1 (take a medical history), 2 (Assess the physical and mental status of the patient), 3 (Prioritize a differential diagnosis following a clinical encounter), 4 (Recommend and interpret diagnostic and screening tests in common situations), 5 (Perform general procedures) 7 (Develop a management plan; discuss orders and prescriptions in common situations'), 8 (document and present patient's clinical encounter; perform handover),9 (Contribute to a culture of safety and improvement and 10 (recognize a patient requiring urgent or emergent care and initiate evaluation and management | Over 80% of students rated 'managing time efficiently' and 'communicating around care transitions' as very important pre-internship skills. Of the institutional objectives, 87% rated 'recognising critically ill patients' and 'knowing when to ask for help' as the most important pre-internship skills. | Although the emphasis on knowing when to ask for help and communication around care transitions differed somewhat across stakeholders, educational priorities were shared by students, residents, educators and institutional objectives. |

**Table 2** (continued)

| Study | Population (*n*) | Study Type | Aims | EPAs | Mainly Results | Conclusions |
|---|---|---|---|---|---|---|
| S9 | 780 | Qualitative study | To develop and provide a longitudinal curriculum for formative assessment of Entrustable Professional Activities (EPAs) in medical school, trough simulation and implement them in differents backgrounds | EPAs from AAMC [22]: 4 (Recommend and interpret diagnostic and screening tests in common situations), 7 (Develop a management plan; discuss orders and prescriptions in common situations'), 8 (document and present patient's clinical encounter; perform handover), 9 (Contribute to a culture of safety and improvement and 10 (recognize a patient requiring urgent or emergent care and initiate evaluation and management) | Simulations were well-received by medical students. Feedback from students was overwhelmingly positive and highlighted the ability of a simulation setting to provide students with a safe environment to take a leading role in attempting to manage unstable patients, as well as simply providing an opportunity to translate what they learned in the classroom into actual practice Deliberate practice and longitudinal formative assessment were considered crucial for the effective development of core EPAs before making final entrustment decisions. | Simulations were an effective way to offer formative assessment of EPAs and were highly appreciated by medical students. |
| S10 | 152 | Analytic observational cross-sectional study | To evaluate students' self-perception on the EPAs using an online survey. | A list of 46 EPAs presented in Principal Relevant Objectives and Framework for Integrated Learning and Education in Switzerland (PROFILES) [23]<br>EPAs about EM analyzed in the article:<br>Manage a patient with transient loss of consciousness, syncope, coma or seizures;<br>Manage a patient with severe hypotension or shock;<br>Manage a patient with acute chest pain;<br>Manage a patient with acute severe headache or meningism;<br>Manage a patient with acute abdominal pain;<br>Manage a patient with severe hypertension;<br>Manage a patient with uncomplicated trauma, such as a fall or minor traffic injury;<br>Manage a patient with severe acute blood loss. | There was a significant gap between the reality and the expectations from the students. The lowest levels of autonomy were reported for EPAs related to urgent and emergency care. | There was a notable difference between the expectations of curriculum developers and the skills perceived in students, particularly in practical skills and emergency situations. |
| S11 | 73 | Analytic experimental study | To evaluate the performance of medical students before and after submission at a curriculum using EPAs | EPA 10 from AAMC [22]: recognize a patient requiring urgent or emergent care and initiate evaluation and management. Authors developed two simulated scenarios: chest pain/cardiac arrest and respiratory distress. | Mean scores from pretest to final posttest in the chest pain/cardiac arrest and respiratory distress cases significantly | A new directed curriculum of standardized simulation using EPAs was effective to improve performance of medical students. |

highly specialized professionals, the literature has significantly reinforced EPAs' use in undergraduate scenarios. Indeed, some articles argue that undergraduate EPAs learning improves medical formation, allowing better professional performance, in order to guarantee greater safety for physicians when developing its services, as well as a greater service quality for the population that is receiving care.

Under this view, USA and Canada recently developed or updated EPAs in Emergency Medicine, and adapted them to undergraduate programs. [22, 25] In most of them, EPAs are divided into levels of entrustment. Level 1: The trainee is allowed to be present and observe but

not perform the EPA; Level 2: The trainee is allowed to perform EPA under direct and proactive supervision present in the room; Level 3: The trainee is allowed to perform EPA without a supervisor in the room, but readily accessible if necessary, e.g., with indirect and reactive supervision; Level 4: The trainee is allowed to work without supervision, Level 5: The trainee is allowed to supervise novice learners. [1] Some studies assume that level 1 would be attributable to a young doctor who finished Medical School, reinforcing the importance of its application in undergraduate scenarios. [7, 13–14, 16, 17, 18, 19, 21] Nonetheless, the level of entrustment that medical schools should offer their students may vary according to the country. For sure, Brazil includes EM as a terminal competency in the Curriculum Guidelines for medical courses, whereas in this country newly graduated junior doctors can legally work in Emergency Departments without supervision. [8, 26] In parallel, Europe presents a core graduation curriculum in order to highlight the importance of teaching EM on the continent to prepare their physicians to develop their professional activities [27].

AAMC's EPA 10 was the most cited EPA in our analysis. It is defined as "Recognizing a patient in need of urgent or emergent care and initiating assessment and management", and is intrinsically aligned with the idea of EM its expansion and greater use in medical education. [28] Although AAMC EPA 10 is relevant to EM, it is actually a generic, and comprehensive EPA that covers a wide range of areas of medical school. So this EPA should be located in almost all, if not in all areas of undergraduate medical education, as each specialty, within its particularities, may present situations that require emergency patient management.

In this sense, the development of EM-related EPAs for undergraduate studies should take into account their adaptation to more specific scenarios are more associated with clearlier EM activities. For example, caring for an elderly patient who has fallen, an adult patient suffering from sudden chest pain, or even recognizing a patient of a critically ill patient and initiating basic cardiac life support, as presented in some of the studies selected in our review, could align more strongly with EM teaching at undergraduate level, in order to prepare students to carry out activities in environments specifically aimed at managing urgencies and emergencies. Thus, student training would be neither shallow, as it not should be reasoned only on a generic EPA; nor overspecialized, as it deals with emergency cases closely linked to certain specialties.

Ten Cate described in detail how to develop an EPA, including a title, justification, description, link to a relevant competency framework, the knowledge, skills, and attitudes required to undertake the task, sources of information to assess progress and the basis for formal entrustment decisions. [1] Some studies, as Kwan et al. [12], describe approaches for developing EPAs. On the other hand, Jonker el al [15] describes a one-year curriculum based in critical care scenarios and EPAs. In general, all the authors cited reinforce the idea that EPAs must be created according to the needs presented by students and according to the resources provided by their creators and evaluators.

Under this bias, the transition from undergraduate medical education (UME) to graduate medical education (GME) training is a difficult period for many new students. This may be derived to a lack of a competency framework that are reasoned in EPAs along undergraduate education. Furthermore, another explanation may be the absence of a link that aims to promote the vertical integration of competencies across the continuum from UME to GME. [29] This could explain the creation of EPAs such as "Manage a patient with transient loss of consciousness, syncope, coma or seizures", whose authors state that their scope was to fill a graduation gap; as well as "Evaluation of patients with respiratory insufficiency, and Evaluation of patients with circulatory insufficiency", whose authors argue that the creation of this EPA facilitates the integration of undergraduate students into post-residency [15, 20].

All studies used simulation scenarios to implement and evaluate EPAs, and there was no description of use of EPAs in health services, such as hospitals or primary care. It is interesting to highlight that only study compared medical students with medical professionals. [20] It noted a significantly gap between the evaluated individuals, reinforcing that neither all medicine school duly train their students, in order to train professionals whose performance does not always meet the demands required. [20] Thus, EPAs implementation would reduce this gap and contributes to a best medical training [20].

As proposed by Czeskleba A. et al., 2019 and Hamui-Sutton, A. et al., 2017 the seven articles of this review 1 highlight that the EPAs implementation can improve the patient's security [7, 13, 16–19, 21, 30, 31]. In effect, these articles discuss that the use of EPAs not only allows medical professionals responsible for patient care services to delegate only activities consistent with their students' capabilities, avoiding possible errors due to overloading them; but also, the students themselves, having precisely described what they need to do and having previously trained the performance of certain skills, tend to develop them with greater mastery, increasing their confidence and the safety of the patients they care for.

Furthermore, all studies that objectively evaluated pre- and post-test demonstrated a significant increase in student skills with training using EPAs. In addition, student satisfaction with the teaching method was relevant, considering that students claim that the EPAs teaching

model positively requires them to become more effective in performing the skill in question, as they tend to study more about the subject and truly put it into practice, which gives them more confidence and courage in performing their skills. [14, 17, 18, 21]

Our review found some barriers to EPA implementation in EM undergraduate teaching, such as a shortage of supervisors for training and a preference for activities not related to EPAs by the students. [4] Additionally, the studies examined mainly concentrated on clinical skills, neglecting important aspects of EM like resource management, adaptability, resilience, teamwork, leadership, communication, and ongoing education. [32] In fact, this may be a boundary between the competencies of an Emergency Medicine Specialist and the EM skills that a newly graduated junior doctor needs to have.

Despite this, the studies presented in this review showed solid justifications for adapt and implementing EPAs in undergraduate teaching, as they demonstrated how useful EPAs are in learning clinical practice, to the extent that they make learning truly meaningful for students, allowing them to enter the precision education model in which they truly work within competency-based frameworks that are essential for their professional development [33, 34]. The factors previously highlighted may be a focus of improvement for future projects that aspire to the implementation and development of EPAs at medical school, so that this review can be used as a source of stimulation for more projects on the subject, which can strengthen the discussion on the topic and make it increasingly practical and applicable in the daytime undergraduate course.

## Conclusion

Although the most commonly EPA assessed was "Recognize a patient in need of urgent or emergent care and initiate assessment and treatment," other EPAs were also identified. Among them, stand out "to treat adult patients with acute chest pain", "to treat elderly patients after a fall", "to recognize and propose initial treatment for patients with vital instability", "to recommend and interpret diagnoses", "to monitor exams in common situations", "to develop a management plan", as well as many others. This identification reflects the wide variability with which EM teaching scenarios are being created around the world. In this sense, a wide range of different needs emerge, which leads, to the creation of different EPAs that seek to meet a specific teaching-learning demand in each location. This meeting might explain why different EPAs in different locations obtained significant student satisfaction and improved their competencies, which strengthened EPAs employment. That should not be composed by only one EPA. In reality, the communion of several EPAs, adapted to the demands of each location of its implementation, would enable a better teaching of EM in graduation.

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**Author contributions**
JCGA was the creator of the project, its main writer and reviewer, guiding the entire work, writing and correcting it throughout the process of its creation. LCPL, RVF, KC and WLA were responsible for assisting in writing the work, in addition to searching for articles relevant to the research, selecting them and including them in the final article. CC, JK, DT, SC, PZT and MAM participated in the final reading of the article, editing it, proposing suggestions, making its language clearer and adding new ideas that greatly contributed to the creation of this workJCGA - Julio Cesar Garcia Alencar; LCPL - Lucas Casagrande Passoni Lopes; RVF - Rafael Vasconselos Ferrazini; KC - Kessy Costa; WLA - Winicius Loureiro Albuquerque; CC - Clara Carvalho; JK - James Kwan; TKPD - Teng Kuan Peng David; SC - Simon Chu; PZT - Patrícia Zen Tempski; MAM - Milton de Arruda Martins.

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**Data availability**
No datasets were generated or analysed during the current study.

## Declarations

**Ethics approval and consent to participate**
This study is a Systematic Review that did not directly involve humans. So, by its nature, there is no necessity to seek an ethics approval and consent to participate.

**Consent for publication**
Not applicable.

**Competing interests**
The authors declare no competing interests.

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