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Entrustable professional activities in nursing education: a scoping review

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Keywords: competency based education, education, nursing

ABSTRACT

Background: Entrustable professional activities (EPAs) have been used in undergraduate and graduate medical education and in other health professions for a long time. They are regarded as a suitable way for bridging the gap between competency-based education and actual work tasks in the workplace. In nursing education, EPA development started later and it is unclear which EPAs have been developed and implemented yet.
Objectives: This scoping review aims to identify which EPAs have been developed in nursing education, which of these have even been implemented and what the empirical evidence is supporting any effects of implementation.
Eligibility criteria: Publication period from the first mention of EPAs in 1995 up until 2023, no language restrictions, all types of literature if they had a clear mention of EPAs, all academic nursing education fields, EPAs must be mentioned in the title or abstract.
Sources of evidence: Screening was conducted in a two-stage process with two authors. Thirteen suitable articles were included which describe either the development, implementation or assessment of EPAs.
Results: Results indicate that EPAs have been developed in 16 areas of nursing education, including special areas such as palliative care or emergency/intensive care. The activities *Health status assessment, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy* were described most often. In four out of 13 cases EPAs were implemented. Described evidence indicates that the use of EPAs improves critical thinking, promotes flexibility in teaching and leads to a mindset change.
Conclusions: EPAs are increasingly developed and implemented in nursing education. There seems to be an overlap between EPAs mainly covering the steps of the care process.

Strengths and limitations of this study

- The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) was followed
- A comprehensive and systematic map of Entrustable professional activities is presented
- Articles might have been missed due to language restrictions and because EPAs are not clearly designated as such.
- A critical appraisal of the quality of the evidence was not conducted.

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Competing interests

None declared.

INTRODUCTION

Entrustable professional activities (EPAs) already found their way into medical education a long time ago and were first described by Olle Ten Cate in the 2000s (1). They can be defined as units of professional practice that healthcare supervisors can fully entrust to trainees once they achieve sufficient levels of competency (2). Since a competence describes the capability of a trainee and an EPA a workplace-based task, EPAs always require the integration of several competences. EPAs thus provide the opportunity to integrate competency-based education into the real clinical environment and to teach abstract competencies in this environment in a lively way (3).

Complete EPAs typically consist of the following elements, as proposed by Ten Cate et al (4):

1. EPA Title: a short, informative description of the activity.
2. Specification and limitations: a clear indication of what is included in the EPA and what is not, as well as the context.
3. Information on potential risks in case of failure
4. Most relevant domains of competence: relation of the EPA to the competency framework used.
5. Required experience, knowledge, skills, attitude and behavior: tools and behaviors needed before being trusted to perform the EPA
6. Assessment information sources to assess progress and ground a summative entrustment decision: sources of information to determine progress
7. Entrustment for which level of supervision is to be reached at which stage of training: levels of training at which trainees can be trusted to carry out tasks in direct or indirect supervision
8. Expiration date: regular practice of EPA is needed, otherwise entrustment should drop

Meanwhile, EPAs are not only used in graduate medical education but also in undergraduate medical education and by many other health professional students such as dentistry, global health, physiotherapy or pharmaceutical education (5-8). EPAs are also becoming more and more important in nursing education and EPA-sets are increasingly being developed in undergraduate nursing (9, 10). However, for academic nursing programs, it is unclear how many EPAs have been developed. Therefore, an overview of the current status regarding the development and implementation of EPAs in nursing education programmes is necessary.

The aim of this review is to provide an overview of EPAs in nursing education. The specific review questions are:

1. Which EPAs have been developed/proposed for nursing education?
2. Which EPAs have been implemented in nursing education
3. What is the empirical evidence supporting any effects of implementing EPAs in nursing education programmes?

METHODS

Protocol and registration

The corresponding scoping review protocol was published previously (11). The reporting of this scoping review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) (12).

Eligibility criteria

All articles or studies relating to EPAs and nursing were considered. In addition, the following inclusion criteria were applied:

(1) Publication period from the first mention of EPAs in 1995 up until 2023 (1 January 1995 to 31 December 2023)
(2) All languages
(3) All types of literature including descriptive studies, interventional studies, reviews and opinions if they clearly described EPAs
(4) All academic nursing education fields including undergraduate, postgraduate, student nurses, nursing education and bachelor of science in nursing. Clinically based programmes if they present any EPAs used to train nursing students
(5) EPAs must be mentioned in the title or abstract

Information sources

Search strategies for the various databases were developed based on keywords relating to nursing education and EPAs, which were linked by Boolean operators. After this, the following electronic databases were searched: MEDLINE and EMBASE via OVID, CINAHL and ERIC via EBSCO host (11). The most recent search was executed on 22nd of March 2024.

Search

All search strings used are listed in Table 1.

Table 1: Search strings for electronic databases (1 January 1995-31 December 2023)

Databases	Searches
Medline and Embase combined search via OVID	((entrustable professional activit* or epa or epas) and (nursing education or nursing student* or nurs*)).ti, ab.
ERIC und CINAHL combined search via EBSCOhost	TI ((“entrustable professional activit*” or epa or epas)) AND AB ((“nursing education” or “nursing student*” or nurs*))

Selection of sources of evidence

Screening was conducted in a two-stage process. The first author screened all databases following the electronic search strategy. Duplicates were removed using the predefined settings in OVID and EBSCOhost. After this, all results were extracted into tables. The first author looked at all the full texts and checked their suitability. All unsuitable articles were removed. A second reviewer looked at all articles independently and also removed all unsuitable articles. The result between the two was compared. In case of disagreement, a third reviewer was consulted.

Data charting process

Relevant article characteristics were extracted according to predefined criteria which is shown in Table 2. Identified EPAs were described separately in greater detail in a second table.

Data items

Extracted data are shown in table 2.

Table 2: Data charting variables/domains

PCC Elements	Item/domain	Description
	Year	Year of publication
	Author/s	List of all authors
	Publication type	Review, commentary, empirical study, other
	Study design	Descriptive, experimental
	Geographical location	Continent, country
Population	Setting	Type of school/institute/educational clinic
Context	Type of nursing programme	Undergraduate, postgraduate, bachelor of science in nursing or other type of academic programme/clinic
Concept	EPAs* characteristics	What are the EPAs described and how are they characterized?
	Title	Title of the EPA (4)
	Specifications	Included activities (4)
	Limitations	Excluded in the activity (4)
	Most relevant competency domains	Competency framework used to develop the EPAs (4)
	Implementation	Yes/no. If 'yes', when and how?
	Effects	Outcomes and effects
	Evidence supporting effects	Effect sizes

*EPAs, entrustable professional activities

Critical appraisal of individual sources of evidence

A critical appraisal and risk of bias assessment was not conducted.

Synthesis of results

A matrix was created in which the individual EPAs were compared with the subject areas and publications.

RESULTS

Selection of sources of evidence

The search via Ovid initially resulted in 336 hits including duplicates, while EBSCOhost resulted in 26 hits including and excluding duplicates. After removing the duplicates, 224 hits remained for Ovid. Of these hits, 13 suitable articles remained (Figure 1). After completing the search, another article from 2024 was found to be suitable, which was included independently of the search. This gives a total of 14 included articles.

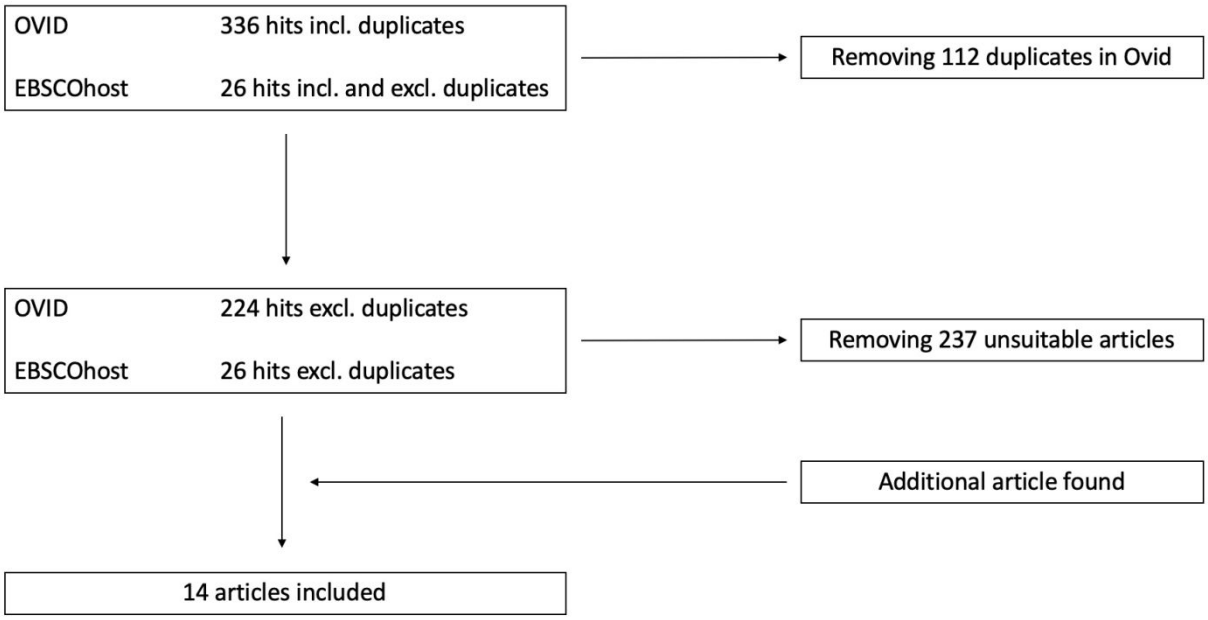

Figure 1: Flow diagram on the results of the screening process

Characteristics of sources of evidence

Detailed descriptions of the included articles can be found in the Supplement. Six articles described EPAs addressing General Nursing (9, 10, 13-16). Seven articles described EPAs addressing specialties including critical care, surgical nursing, family nursing, hospice care, emergency care nursing, nursing telehealth and Adult Gerontology Primary care (17-23). Most EPAs were from General Nursing by far. Most studies used qualitative designs (9, 10, 13-16, 18, 20, 21, 23). Three studies used both qualitative and quantitative designs (17, 19, 22).

Results of individual sources of evidence

The described General Nursing EPAs included topics such as “Gather information and perform physical examination” (10), “Prioritize a Differential Diagnosis Following a Clinical Encounter” and “Document a Clinical Encounter in the Patient Record” (13), “Interprofessional collaboration” (9), “recognize and manage patients requiring urgent care” (15) or “Provide health education and nursing consultation” (16). The described special nursing EPAs included topics such as “Performs manual opening and insertion of temporary airway maintenance devices” (18), “Assessing and Managing Patients with Acute Medical Presentations” (22) and “Integrated immediate postmortem and acute bereavement care” (23). Most EPAs were not implemented (10, 13, 15-19, 21, 23). When EPAs got implemented, following effects of implementation were described: EPAs are helping as a systematic assessment, fostering teamwork and critical thinking as well as providing flexibility in assessments, but there is still unclear assessment criteria, a lack of standardization and manpower and a change of mindset is needed to adapt to EPA skills (9). Details of proposed EPAs are described in the Supplement.

Synthesis of results

In total, EPAs have been developed in 16 areas of nursing education (see Table 3).

Table 3: Matrix of synthesis of results

	General Nursing						Special Nursing							
	Al-Moteri, et al. 2021	Anthamatten et al. 2019	Lau et al. 2020	Mihaljevic et al. 2018	Zhou et al. 2022	Yang Yang et al. 2024	Li et al. 2022	Miranda et al. 2021	Moore et al. 2020	Surjadi, Saxe 2019	van Houwe-lingen et al. 2016	Chiang et al. 2022	Lai et al.2023	Sum
Health status assessment (incl. nursing admissions)	1	1	1	1	1	1	1	1	1	1	1	1	0	12
Diagnoses (prioritize nursing diagnoses, differential diagnoses)	1	1	0	0	0	1	1	0	1	1	1	0	0	7
Care measures	1	1	1	0	1	1	1	1	1	1	0	1	0	10

Care documentation	1	1	0	0	0	0	0	0	1	1	0	0	0	4
Care plans, protocols	1	0	0	1	1	1	1	0	0	1	1	0	0	7
Emergency /intensive care measures	1	1	1	0	1	1	1	1	0	0	0	0	0	7
(Psychological) support	1	0	1	0	0	0	0	0	0	0	1	0	0	3
Patient education, guidance	0	0	1	0	0	1	0	0	0	0	1	0	0	3
Joint decision-making	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Prevention and health promotion	1	0	0	0	1	0	0	0	0	0	1	0	0	3
Participation in diagnostics and/or therapy	0	1	0	0	1	1	1	1	1	0	1	0	0	7
Evidence-based work	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Communication (incl. patient handover and presentation)	0	1	0	0	0	1	1	0	1	1	0	1	0	6
Interprofessional work (incl. ward rounds, discharges)	0	1	1	1	0	1	1	1	0	0	0	0	0	6
Leadership/ Management	0	0	1	0	1	1	1	1	0	1	1	1	0	8
Palliative care	0	0	1	0	0	0	0	0	0	0	0	0	1	2

Most EPAs have been developed in the areas *Health status assessment* (n =12), *Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy.* The fewest EPAs were developed in the areas *Joint decision making, Evidence-based work* and *Palliative care.* EPAs were implemented in the following areas: *Health status assessment (incl. nursing admissions), Care measures, Emergency/intensive care measures, Patient education and guidance, Prevention and health promotion, Communication (incl. patient handover and presentation), Interprofessional work (incl. ward rounds, discharges), Leadership/Management, Palliative care*.

DISCUSSION

Our scoping review results indicate that EPAs have been developed for 16 different areas of the care process. There appear to be considerable similarities within the EPAs *Health status assessment, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy* across different studies. This indicates that there seems to be some kind of agreement about core EPAs in nursing education which is similar the widely used nursing process consisting of the components Assessing, Diagnosing, Planning, Implementing and Evaluating which reflects in the nursing diagnoses of the *NANDA-I-taxonomy* (24). Thus, the development of EPAs so far clearly follows the internationally established care process, which includes both care in the narrower sense and medical action.

Both positive experiences and challenges were described during the implementation process. Nursing education appears to follow medical education, where a large number of EPAs exists today (25).

However, although EPAs seem to offer advantages compared to competency-based frameworks (26), empirical evidence supporting these assumptions is low. EPAs seem to offer a good opportunity to facilitate the process of transferring competencies into clinical practice. Nevertheless, it is still unclear whether EPAs actually lead to better clinical performance outcomes compared to competency-based training. We were unable to identify robust evidence or study designs, to evaluate the effects of EPAs.

Overall, EPAs on essential and fundamental aspects of the nursing process (e.g. health status assessment, care measures, care plans) have been developed independently by different authors. On the other hand, there are special EPAs such as those for palliative care that seem to be unique. However, it has also been shown that EPAs are not always named as such. For example, *Ramirez et al.* listed "Knowledge and Task Practice Standards for the Emergency Nurse Practitioner", which are similar to EPAs (27). The partly inconsistent naming of EPAs must surely be regarded as an impeding factor in the further dissemination and implementation of nursing EPAs.

Our review results indicate, that not all of the eight elements of a complete EPA (see introduction) specified by Ten Cate et al. (4) are always fully specified for developed EPAs. In most cases, the title, specifications and competency domains are given, whereas in particular the supervision level and assessment information are rarely listed. This is currently leading to an emerging discrepancy between the ideal depth of an EPA and the actual quality of developed nursing EPAs. To counteract this development, the "EQual" scoring rubric (28) has been established in medicine for some time now. This provides a standardized opportunity for internal validation and for identifying EPAs that are insufficiently developed with regard to, among other aspects, the propagated EPA elements. This structured evaluation might be useful to develop and validate state-of-the-art EPAs in nursing education in the future.

Limitations

Since we included articles in English only, we may have missed EPAs published in other languages.
Since not all published EPAs are clearly designated as such, we may have missed other published frameworks similar to EPAs.

Conclusions

EPAs become more and more popular in nursing education. They largely cover the key steps of the nursing process but also address advanced and specialty topics.

The fact that EPAs are now increasingly being used and implemented in nursing curricula raises the question whether EPAs actually improve nursing education. In addition, the extent to which the achievement of objectives in nursing education is actually improved by EPAs should be further investigated as well.

Author Contributions

Conceptualisation and design of study: JP, JK and AM. Collected and reviewed data: JP, JK and AM. Wrote the manuscript: JP and JK. All authors revised and approved the manuscript.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication

Not commissioned; externally peer reviewed

Words

1821

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SUPPLEMENT

Characteristics of all articles:

Nr	Authors	Year	Title	Publication type	Study design	Results regarding EPAs	Geographic location	Setting	Type of nursing program
1	Al-Moteri, Youssef, Elryah, et al	2021	Development of undergraduate nursing entrustable professional activities through using a participatory design approach	Empirical study	Qualitative	Development of 8 core EPAs, including descriptions and competency domains	Saudi Arabia, Asia	General nursing	BSc Nursing
2	Anthamatten, Richmond, Glassford	2019	Exploring the Utility of Entrustable Professional Activities as a Framework to Enhance Nurse Practitioner Education	Empirical study	Qualitative	Several medical EPAs and their competencies were matched to nurse practitioner competency domains	USA, North America	General nursing	MSc Nursing
3	Lau, Samarasekera, Shorey	2020	Evaluation of an undergraduate nursing entrustable professional activities framework: An exploratory qualitative research	Empirical study	Qualitative	EPAs developed and discussed based on Singapore Nursing Board (2018) competencies	Singapore, Asia	General nursing	BSc Nursing BSC Nursing Honors
		2020	Development of undergraduate nursing entrustable professional activities to enhance clinical care and practice						
4	Li, Tekin, Cui, et al	2022	A novel multimodal needs assessment to inform the longitudinal education program for an international interprofessional critical care team	Empirical study	Qualitative and quantitative	Development of 20 EPA statements describing essential critical care EPAs	China, Asia	Critical care	Not described
5	Mihaljevic, Mitzkat, Probst, et al	2018	Heidelberger Interprofessionelle Ausbildungsstation (HIPSTA): a	Empirical study	Qualitative	Development of curriculum including	Germany, Europe	General nursing	BSc (Interprofessional Healthcare)

			practice- and theory-guided approach to development and implementation of Germany's first interprofessional training ward			EPAs to be used as learning goals for an interprofessional training ward for nurses and physicians			
6	Miranda, Mazzo	2021	Competences in the training of nurses to assist the airway of adult patients in urgency and emergency situations	Empirical study	Qualitative	Development and validation of EPAs and their competencies for training nurses	Brazil, South America	Surgical nursing	MSc Nursing (Medical-Surgical Nursing)
7	Moore, Hawkins-Walsh	2020	Evaluating Nurse Practitioner Student Competencies: Application of Entrustable Professional Activities	Empirical study	Qualitative and quantitative	Successful evaluation of pilot EPAs to assess student clinical competence, according to faculty and student responses (70% found EPA descriptions useful or requiring minor editing in assessing students)	USA, North America	Family Nursing	MSc Nursing (Family Nursing Practitioner)
9	Surjadi, Saxe	2019	Entrustable Professional Activities in Nurse Practitioner Education	Empirical study	Qualitative	Evaluation of standardized clinical evaluation tool that includes EPA-focused assessment process	USA, North America	Adult Gerontology Primary Care	MSc Nursing (Adult Gerontology Primary Care Nurse Practitioner)
10	van Houwelingen, Ettema, Kort, et al	2016	Competencies required for nursing telehealth activities: A Delphi-study	Empirical study	Qualitative	Consensus via Delphi study on 14 nurse telehealth	Netherlands, Europe	Nursing telehealth	Not applicable

						EPAs, identified 52 competencies for telehealth			
11	Zhou, Poh, Chan et. al	2022	Development of entrustable professional activities for advanced practice nurses education.	Empirical study	Qualitative	Development and pilot testing of nine core EPAs	Singapore, Asia	General nursing	Advanced practice nurse (APN) education
12	Chiang, Yu, Chung et. al	2022	Implementing an entrustable professional activities programmatic assessment for nurse practitioner training in emergency care: A pilot study.	Observational study	Qualitative and quantitative	Development of four nested EPAs for emergency care nurse practitioners	Taiwan, Asia	Emergency care nursing	Nurse practitioner training program
13	Lai, Liu, Chen, Anna	2023	Integrated immediate postmortem and acute bereavement care: Competency-based entrustable professional activities for nursing.	Empirical study	Qualitative	Identification of four major EPA components and three essential competencies as highly correlated to those components concerning immediate postmortem and acute bereavement care	Taiwan, Asia	Hospice care	Not described
14	Yang Yang, Yue Hana, Huan Xu et. al	2024	Development of the core competency-based entrustable professional activities for Master of Nursing Specialist (MNS) graduates in China	Empirical study	Qualitative	Development and evaluation of 12 EPAs for Chinese Master of Nursing Specialists graduates	China, Asia	General nursing	Master of Nursing Specialist (MNS) graduates

Details of proposed EPAs:

Article 1: Al-Moteri M, Youssef HAM, Elryah AAI, Yaseen RWH, Begum F, Abdelgadir WI, et al. Development of undergraduate nursing entrustable professional activities through using a participatory design approach. J Prof Nurs. 2021;37(4):741-8.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Gather information and perform physical examination	Perform complete, focused and an ongoing patient/family/community including history taking, physical examination and interpret diagnostic test	Competency domains developed for all EPAS: 1. Evidence based practise 2. Critical thinking and problem solving 3. Communication 4. Patient centred care 5. Professionalism 6. Leadership and responsibility 7. Information technology 8. Quality of care and patient safety 9. Nursing knowledge and clinical skills	No	Not described	Not described	
EPA 2: Formulate and prioritize nursing diagnoses	Analyze patient/family/community data, identify health problems, formulate and prioritize nursing diagnoses					
EPA 3: Formulate and implement care plan	Formulate goals and outcomes that directly impact the care of patient/family/community, with all different types of health problems, issues and conditions, where the required interventions guided by evidence-based practice are carried-out					
EPA 4: Perform general clinical procedures	Perform invasive and non-invasive clinical procedures that are universal among registered nurses					
EPA 5: Recognize conditions requiring emergent care	Identify signs and symptoms of patient/family/community clinical/physical/mental deterioration that need immediate attention and rapid response					
EPA 6: Apply comfort and psychological support	Identify and apply psychological support to all concerns with emotional wellbeing of the patient/family/community, including issues of self-esteem, insight into adaptation to their					

	illness and its consequences.					
EPA 7: Promote health and prevent disease	Enable patient/family/community to increase control over and to improve their health and physical capacity					
EPA 8: Reporting patient condition and documenting care	Document and report pertinent patient information, care provided, physical/psychosocial responses of patient/family/community to nursing intervention and progress toward problem resolution					

Article 2: Anthamatten A, Pfieffer ML, Richmond A, Glassford M. Exploring the Utility of Entrustable Professional Activities as a Framework to Enhance Nurse Practitioner Education. Nurse Educ. 2020;45(2):83-7.

EPA Title	**EPAs Characteristics**	**Competency Domains**	**Implemented?**	**Effects/Results**	**Evidence Supporting Effects**	**Comments**
EPA 1: Gather a History and Perform a Physical Examination EPA 2: Prioritize a Differential Diagnosis Following a Clinical Encounter EPA 3: Recommend and Interpret Common Diagnostic and Screening Tests EPA 4: Enter and Discuss Orders and Prescriptions EPA 5: Document a Clinical Encounter in the Patient Record EPA 6:		Not described	No	Not implemented yet	Not described	

Provide an Oral Presentation of a Clinical Encounter EPA 7: Form Clinical Questions and Retrieve Evidence to Advance Patient Care EPA 8: Give/Receive a Patient Handover to Transition Care Responsibility EPA 9: Collaborate as a Member of an Inter-professional Team EPA 10: Recognize a Patient Requiring Urgent/Emergent Care and Initiate Evaluation and Management						

Article 3: Lau ST, Ang E, Samarasekera DD, Shorey S. Development of undergraduate nursing entrustable professional activities to enhance clinical care and practice. Nurse Educ Today. 2020;87:104347.

EPA Title	**EPAs Characteristics**	**Competency Domains**	**Implemented?**	**Effects/Results**	**Evidence Supporting Effects**	**Comments**
EPA 1: Patient Engagement	Engage patients, families, or caregivers to enhance the patient's experience	1. Communication 2. Knowledge application 3. Health assessment 4. Nursing process 5. Critical thinking/problem solving skills 6. Reflective practice 7. Documentation	Yes Implemented in two phases starting December 2017 and ending in May 2018	Themes identified from focus groups: Positive effects: EPAs helping as a systematic, comprehensive assessment of holistic patient care; fostering teamwork and critical thinking; as well as providing flexibility in assessments.	Systematic assessment: "it gives you like a structure to perform your clinical activity"	
EPA 2: Patient care and practice	Prioritize and provide patient care utilizing nursing practice standards					
EPA 3: Care management	Perform comprehensive health assessments and deliver and evaluate care for patients				Critical thinking: "…it forces us to think critically. Because like, its good in the sense like oh	

		8. Interpersonal skills		Negative effects: unclear assessment criteria; change of mindset needed to adapt to EPA skills; lack of standardization; lack of manpower and time constraints.	okay, to care for patient, there is a lot of aspect and EPA is all these things…"	
EPA 4: Common procedures	Perform procedures (e.g. verify a doctor's/nurse's order from a medical record or provide the appropriate emotional support to a patient) required of a registered nurse				Flexibility: Hosp CI: "…we use peer teaching, sometimes we break them into small groups, we have small group discussions…" (AHFGD2)	
EPA 5: Safety	Deliver care utilizing patient safety standards				Unclear criteria: "You know if you need CI's help half the time it is entrustment level 3, if you need me for help for 75% of the time it is a level 2. But the variable here is how the how the CI determine help needed?"	
EPA 6: Urgent care	Recognize patients requiring emergency care, initiate management, assist in resuscitation, and stabilize critically ill patients					
EPA 7: Transition care	Lead health care professionals in transiting patients within and between teams				Mindset change: "OT (operating theatre) I will admit is a bit hard because some of the competency also not there. The patient lying at the table, what EPA assessment are you really going to do?"	
EPA 8: Patient education	Conduct education for patients, families, or caregivers to improve health through health promotion and disease prevention					
EPA 9: Interprofessional collaboration	Collaborate with interprofessional teams to improve the quality of healthcare				Lack of standardization: "there was a bit of discrepancy in terms of the teaching cos of the ward culture…"	
EPA 10: Palliative care	Perform assessments and deliver and evaluate care for patients requiring palliative or end-of-life care in the hospital or community				Lack of manpower/time constraints: "mainly it's the CI who assess us, but the CI don't	

					really have a lot of time also. So, sometimes they will just ask the staff like how we did and stuff. Then, they will just base on their feedback."	

Article 4: Li H, Sun Y, Barwise A, Cui W, Dong Y, Tekin A, et al. A novel multimodal needs assessment to inform the longitudinal education program for an international interprofessional critical care team. BMC Med Educ. 2022;22(1):540.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
	EPA 1: Evaluate and manage patients presenting with acute respiratory failure, including early recognition, diagnostic evaluation, and treatment of most likely causes including pneumonia, obstructive lung disease exacerbation, congestive heart failure, pulmonary embolism and tension pneumothorax.	1. Organ support and disease management 2. Practical skills 3. Quality improvement 4. Patient-centered care and communication 5. Interprofessional skills	No	Not described	Not described	Abstract mentions development of essential critical care EPAs but no further details provided
	EPA 2: Evaluate and manage patients with sepsis and septic shock, including early recognition, resuscitation, appropriate antibiotics, and systematic evaluation for source control.					
	EPA 3: Evaluate and manage common nephrology conditions in the ICU, including acute kidney injury, renal replacement therapy, and acid base and electrolyte disorders.					
	EPA 4: Provide compassionate, patient-centered care, engaging with patients and family					

	members in shared decision making using collaborative communication skills, empathy, and respect.					
	EPA 5: Evaluate and manage patients presenting with acute common cardiovascular conditions, including arrhythmias, acute coronary syndromes, valvular heart disease, congestive heart failure, and vascular emergencies.					
	EPA 6: Evaluate and manage patients with shock, including early recognition, rapid diagnostic evaluation, and targeted treatment of cardiogenic, hypovolemic/hemorrhagic, distributive and obstructive shock, including targeted vasopressor management.					
	EPA 7: Evaluate and manage patients presenting with poisoning or overdose, including complications of alcohol, drug intoxication and withdrawal.					
	EPA 8: Evaluate and manage common gastroenterology conditions in the ICU, including acute gastrointestinal hemorrhage, difficile colitis, bowel obstruction and perforation, complications of hepatobiliary disease, and pancreatitis.					
	EPA 9: Evaluate and manage common hematology and oncology conditions in the ICU, including coagulopathy, acute/massive hemorrhage, common					

	malignancies and their associated complications.					
	EPA 10: Evaluate and manage common neurologic conditions in the ICU, including encephalopathy, seizure, stroke, and intracranial hemorrhage.					
	EPA 11: Identify, evaluate and manage patients with ARDS, collaborating with Respiratory Therapy and utilizing institutional protocols to deliver safe and effective lung protective ventilation, rapidly identify patients with refractory hypoxemia, and appropriately employ early liberation strategies.					
	EPA 12: Resuscitate and stabilize critically ill patients, performing necessary diagnostic and therapeutic interventions in a timely manner and effectively coordinating care with the interprofessional critical care team and appropriate consultants.					
	EPA 13: Safely and efficiently perform procedures common to the practice of critical care medicine, and demonstrate understanding of indications, contraindications, limitations, and complications of these interventions.					
	EPA 14: Diagnose and manage acute pain in critical illness and the perioperative setting, including appropriate use of opioids, non-opioid					

	analgesics, and assessment scales.					
	EPA 15: Evaluate and manage common critical care infections, including meningitis/encephalitis, pneumonia, catheter related bloodstream infections, simple and complicated biliary, urinary tract, skin and soft tissue infections, and opportunistic pathogens commonly seen in immune compromised hosts.					
	EPA 16: Professional, respectful and timely in the execution of all clinical activities, with appropriate communication and collaboration within interprofessional team.					
	EPA 17: Ensures effective transitions of care through consistent, concise communication of patient care plans and recommendations.					
	EPA 18: Leads efficient and effective ICU rounds by soliciting and incorporating collaborative input from the interprofessional team, appropriate consulting services, patients and families to develop a well-organized, appropriate plan of care.					
	EPA 19: Efficiently employ critical care protocols and checklists to prevent common critical care complications, and effectively diagnose and manage delirium, venous thromboembolism, nosocomial infections, malnutrition, hyperglycemia, decubitus					

	ulcers, and musculo-skeletal complications.					
	EPA 20: Evaluate and manage perioperative patients and common post-surgical complications.					

Article 5: Mihaljevic AL, Schmidt J, Mitzkat A, Probst P, Kenngott T, Mink J, et al. Heidelberger Interprofessionelle Ausbildungsstation (HIPSTA): a practice- and theory-guided approach to development and implementation of Germany's first interprofessional training ward. GMS J Med Educ. 2018;35(3):Doc33.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Interprofessional surgical ward round	Conduct interprofessional ward rounds of postoperative patients on HIPSTA and jointly prepare an interprofessional plan for further diagnostic, therapeutic, nursing and rehabilitative treatment of the patient	Competency Domains derived from CanMeds/NKLM (Nationaler Kompetenzorien-tierter Lernzielkatalog). EPA 1: Medical expert, Communicator, Collaborator, Leader/manager, Professional	Yes	Not described	Not described	
EPA 2: Interprofessional patient admission	Perform an interprofessional preoperative admission of a patient to a surgical ward	EPA 2: Medical expert, Communicator, Member of a team, Leader/manager, Professional				
EPA 3: Interprofessional discharge management	To manage the discharge of a surgical patient together as an interprofessional team from the acute care setting to the subsequent health care sector (e.g. home, nursing home, rehabilitation centre) considering the individual needs of the patient as well as the intersectoral characteristics of the health care system	EPA 3: Medical expert, Communicator, Member of a team, Leader/manager, Professional				

Article 6: Miranda FBG, Alves Pereira-Junior G, Mazzo A. Competences in the training of nurses to assist the airway of adult patients in urgency and emergency situations. Rev Lat Am Enfermagem. 2021;29:e3434.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Briefly performs an anamnesis and focused physical examination of the airway	Knows the anatomy and physiology of the upper and lower airways; performs targeted anamnesis and physical examination, and associates anamnesis and physical examination with possible Nursing diagnoses.	Scientific knowledge, Technical skill (manual dexterity), Communication, Decision-making, Clinical reasoning	No	Not described	Not described	Described in the article as competence framework, these are actually descriptions
EPA 2: Performs manual opening and insertion of temporary airway maintenance devices	Identifies and describes signs and symptoms of airway impairment; recognizes needs and priorities in the development of actions relevant to forecasting devices, materials, and equipment needed to clear the airways; performs the manual airway opening techniques of head tilt-chin lift, jaw-thrust, and chin lift; performs the insertion techniques of temporary oropharyngeal cannula (Guedel) or nasopharyngeal cannula; and describes indications and contraindications for the use of these devices	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Decision-making, Clinical reasoning				
EPA 3: Recognizes the need for and the conduction of an intervention in airway aspiration	Recognizes the need and aspirates the airways with the type of material appropriate to the patient's clinical case, performs the pulse oximetry insertion techniques to check peripheral capillary oxygen saturation, identifies factors (distal perfusion, low temperature, lesions, etc.) that can make it difficult to read peripheral capillary oxygen saturation in the oximeter, and applies the principles of biosafety in patient care with compromised airway	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Decision-making, Clinical reasoning				
EPA 4:	Collaborates or performs the insertion of	Scientific knowledge, Technical skill (manual				

Collaborates or performs the insertion of supraglottic airway devices	supraglottic airway devices	dexterity), Communication, Leadership, Team work, Decision-making, Clinical reasoning, Safety				
EPA 5: Identifies, intervenes and indicates or contra-indicates the techniques of advanced maneuvers to control the airway.	Identifies, intervenes and indicates or contra-indicates the techniques of advanced maneuvers to control the airway.	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Team work, Decision-making, Clinical reasoning, Safety				
EPA 6: Collaborates with the team to perform advanced maneuvers to control the airway	Collaborates with the team to perform advanced manoeuvres to control the airway	Scientific knowledge, Technical skill (manual dexterity), Inter-professional communication, Decision-making, Clinical reasoning, Leadership				

Article 7: Moore J, Hawkins-Walsh E. Evaluating Nurse Practitioner Student Competencies: Application of Entrustable Professional Activities. J Nurs Educ. 2020;59(12):714-20.

EPA Title	**EPAs Characteristics**	**Competency Domains**	**Implemented?**	**Effects/Results**	**Evidence Supporting Effects**	**Comments**
EPA 1a: Gather a history	Obtain a complete and accurate history in an organized fashion. Demonstrate patient-centered interview skills. Demonstrate clinical reasoning in gathering focused information relevant to a patient's care.	Not described	No	Not described	Not described	
EPA 1b: Perform a physical Examination	Perform a clinically relevant, appropriately thorough physical examination pertinent to the setting and purpose of the patient visit. Demonstrate clinical reasoning in gathering focused information relevant to a patient's care.					
EPA 2: Prioritize a differential diagnosis following a clinical encounter	Synthesize essential information from previous records, history, physical examinations, and initial diagnostic evaluations to propose a scientifically					

	supported differential diagnosis. Prioritize and continue to integrate information as it emerges to update differential diagnosis, while managing ambiguity. Engage and communicate with team members for endorsement and verification of the working diagnosis that will inform management plans.					
EPA 3: Recommend and interpret common diagnostic and screening tests	Recommend first-line, cost-effective screening and diagnostic tests for routine health maintenance and common disorders. Provide rationale for decision to order tests, taking into account pre- and post-test probability and patient preference. Interpret results of basic studies and understand the implication and urgency of the results.					
EPA 4: Enter and discuss orders and prescriptions	Compose orders efficiently and effectively on paper, verbally, and electronically. Demonstrate an understanding of the patient's condition that underpins the provided orders. Recognize and avoid errors by attending to patient-specific factors using resources, and appropriately responding to safety alerts. Discuss planned orders and prescriptions with team, patients, and families.					
EPA 5: Document a clinical encounter in the patient record	Prioritize and synthesize information into a cogent narrative. Follow documentation requirements to meet regulations and professional expectations. Document a problem list, differential diagnosis, and plan supported through clinical					

	reasoning that reflects the patient's preferences.					
EPA 6: Provide an oral presentation of a clinical encounter	Present personally gathered and verified information, acknowledging areas of uncertainty. Provide an accurate, concise, well-organized oral presentation. Adjust the oral presentation to meet the needs of the receiver. Demonstrate respect for patient's privacy and autonomy.					

Article 9: Surjadi M, Stringari-Murray S, Saxe JM. Entrustable Professional Activities in Nurse Practitioner Education. The Journal for Nurse Practitioners. 2019;15(5):e97-e102.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA: Independence in Clinical Practice		1. Information gathering/interviewing skills 2. Physical examination Logical sequence and appropriate physical examination maneuvers 3. Clinical judgment/assessment 4. Management plan 5. Professionalism 6. Overall clinical competence	Yes	"Student Performance Evaluations (2016-2018) examples: Complete symptom description increased from a mean of 4.08 to 4.69 Accurate collection of patient's history increased from a mean of 4.28 to 4.79 Evidenced based therapeutic interventions increased from a mean of 3.86 to 4.76 Care coordination and patient, family, and caregiver advocacy increased from a mean of 3.17 to 4.87 Demonstrates cost and efficiency considerations in patient care increased from a mean of 2.6 to 4.83"	Milestones and competencies were evaluated based on a revised EPA evaluation tool, which showed favorable results in ease of completion of the tool for faculty, preceptors, and students	This article focuses on the development and evaluation of an EPA assessment tool for measuring leaner performance

Article 10: van Houwelingen CT, Moerman AH, Ettema RG, Kort HS, Ten Cate O. Competencies required for nursing telehealth activities: A Delphi-study. Nurse Educ Today. 2016;39:50-62.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Support patients	Supporting patients in the use of technology	Coaching skills, the ability to combine clinical experience with telehealth, communication skills, clinical knowledge, ethical awareness, and a supportive attitude	No	Not yet implemented	Not described	Contains comprehensive list of Skills, Knowledge, and Attitudes for each Nursing Telehealth EPA
EPA 2: Train patients	Training patients in the use of technology as a way to strengthen their social network preoperative admission of a patient to a surgical ward					
EPA 3: Health promotion	Providing health promotion remotely					
EPA 4: Triaging	Triaging incoming calls and alarms					
EPA 5: Data analysis	Analyzing and interpreting incoming data derived from (automatic) devices for self-measurement					
EPA 6: Monitoring	Monitoring body functions and lifestyle					
EPA 7: Psychosocial support	Providing psychosocial support					
EPA 8: Encouraging	Encouraging patients to undertake health promotion activities					
EPA 9: Instructing	Instructing patients and family care givers in self-care					
EPA 10: Assessing	Assessing patient capacity to use telehealth					
EPA 11: Evaluating	Evaluating and adjusting the patient care plan					
EPA 12: Coordinating	Coordination of care with the use of telehealth technology					
EPA 13: Double-check	Independent double-check of high-risk medication					
EPA 14: Peer consultation	Guidance and peer consultation					

Article 11: Zhou W, Poh CL, Chan HL, Shorey S. Development of entrustable professional activities for advanced practice nurses education. Nurse Educ Today. 2022;116:105462.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Perform an initial assessment and formulate management plans EPA 2: Manage follow-up care for a clinical encounter EPA 3: Plan, perform and evaluate care procedures EPA 4: Recognise and manage patients requiring urgent care EPA 5: Manage care transitions within and between health care organisations EPA 6: Recognise and manage pharmacological needs of patients EPA 7: Collaborate with patients, families, and community to improve health through disease prevention and health promotion EPA 8: Participate in health quality improvement initiative EPA 9: Develop self and others for professional practice.		Sub-competencies of clinical practices: P1 respect the values, customs, spiritual beliefs and practices of individuals and groups P2 Demonstrate responsibility and accountability within the scope of practice and level of competence P3 Apply key principles of SNB's code for Nurses and Midwives for ethical decision making P4 Practise in accordance with institutional/national legislation, policies and procedural guidelines P5 Ensure own physical, cognitive, psychological & emotional fitness to practice and deliver safe care P6 Aware of one's own knowledge, skill, beliefs, value and emotional limitations that leads to appropriate help-seeking behaviours P7 Recognize clinical ambiguity and utilize appropriate resources in dealing with uncertainty	No	Not yet implemented	Despite the stakeholders having generally positive attitudes towards the use of EPAs, it has its drawbacks. Additionally, the described set of core APN EPAs needs more refinement and rigorous testing before it can be implemented on a larger scale	

Article 12: Chiang YH, Yu HC, Chung HC, Chen JW. Implementing an entrustable professional activities programmatic assessments for nurse practitioner training in emergency care: A pilot study. Nurse Educ Today. 2022;115:105409.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Assessing and Managing Patients with Acute Medical Presentations	Collecting medical history Performing basic physical examinations Arranging and interpreting diagnostic tests Establishing medical orders under the instruction of attended physician Completing medical record Communicating health care plan and obtaining informed consent Identify critically ill patient Counseling and health education	1. Patient care 2. Medical knowledge 3. System-based practice 4. Professionalism 5. Practice-based learning/improvement 6. Interpersonal communicating skills 7. Personal and professional development	Yes	- Novice nurse practitioners (n = 8) were assessed once per week by nurse practitioner leader and two physicians - Increase of average supervision entrustment score in EPA1 (p = 0.011) - No differences in EPA 2, 3, 4 - Longest time required for novice nurse practitioners to achieve a stable level 5 entrustability score for at least 3 consecutive months for EPAs 1, 2, 3, and 4 was 18, 11, 11, and 8 months	Not described	
EPA 2: Performing Basic Procedures	Obtaining informed consent Evaluation before execution Operating skills Evaluation and confirmation after the procedures Providing health education					
EPA 3: Communicating Consultations/Referrals	Monitoring the progress of the patient's condition Seeking consultation/referral resources Communicating with members of consulting/referral subspecialties Facilitating appropriate patient care using consultation/referral information					
EPA 4:	Integrating shift information					

Providing and Receiving the Handover in the Transition of Care	Performing oral handover Receiving messages and asking questions Ensuring complete referral patient's information					

Article 13: Lai WS, Liu LC, Chen HM, Anna A. Integrated immediate postmortem and acute bereavement care: Competency-based entrustable professional activities for nursing. Nurse Educ Today. 2023;126:105812.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA: Integrated immediate postmortem and acute bereavement care	Assist with postmortem care and provide appropriate care and support to bereaved family members experiencing acute grief Four essential EPA components: 1. Cultural and religious ritual assessment 2. Death preparation 3. Postmortem care 4. Acute bereavement care	General clinical skills; Communication and teamwork capabilities; Caring	No	Not yet implemented	Not described	Contains comprehensive list of Skills, Knowledge, Attitudes and experiences

Article 14: Yang Y, Han Y, Xu H, Wang T, Li Z, Huang K, et al. Development of the core competency-based entrustable professional activities for Master of Nursing Specialist (MNS) graduates in China. Med Teach. 2024:1-9.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Perform health assessments		1. Knowledge acquisition 2. Clinical practice 3. Communication 4. Scientific thinking and clinical research	No	Not yet implemented	Not described	
EPA 2: Identify and prioritize nursing diagnoses						
EPA 3: Formulate and implement care plan						

EPA 4: Perform basic and specialized care operations		5. Clinical management and coordination 6. Other competencies				
EPA 5: Recognize and manage medication needs of patients						
EPA 6: Assess and manage patients with mental health problems						
EPA 7: Recognize and assist in rescuing critically ill patients						
EPA 8: Perform transition and handover						
EPA 9: Participate in multidisciplinary team collaborative care						
EPA 10: Provide health education and nursing consultation						
EPA 11: Formulate and implement discharge plans						
EPA 12: Instruct nursing students in a clinical setting						

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Entrustable professional activities in nursing education: a scoping review

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ABSTRACT

Objectives: Entrustable professional activities (EPAs) have been used in undergraduate and graduate medical education and in other health professions for a long time. They are regarded as a suitable way for bridging the gap between competency-based education and actual work tasks in the workplace. In nursing education, EPA development started later and it is unclear which EPAs have been developed and implemented yet. This scoping review aims to identify which EPAs have been developed in nursing education, which of these have even been implemented and what the empirical evidence is supporting any effects of implementation.
Design: Scoping Review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).
Data sources: MEDLINE and EMBASE via OVID, CINAHL and ERIC via EBSCOhost were searched for the period 1 January 1995 to 31 December 2023.
Eligibility criteria: Publication period from the first mention of EPAs in 1995 up until 2023, no language restrictions, all types of literature if they had a clear mention of EPAs, all academic nursing education fields, EPAs had to be mentioned in the title or abstract.
Data extraction and synthesis: Screening was conducted in a two-stage process with two authors. Thirteen suitable articles were included which describe either the development, implementation or assessment of EPAs.
Results: Results indicated that EPAs have been developed in 16 areas of nursing education, including special areas such as palliative care or emergency/intensive care. The activities *Health status assessment, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy* were described most often. In four out of 13 cases EPAs were implemented. Described evidence indicated that the use of EPAs improved critical thinking, promotes flexibility in teaching and leaded to a mindset change.
Conclusions: EPAs were increasingly developed and implemented in nursing education. There seemed to be an overlap between EPAs mainly covering the steps of the care process.

Strengths and limitations of this study

- The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) was followed
- A comprehensive and systematic map of Entrustable professional activities is presented
- Articles might have been missed due to language restrictions and because EPAs were not clearly designated as such.
- A critical appraisal of the quality of the evidence was not conducted.

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Competing interests

None declared.

INTRODUCTION

Entrustable professional activities (EPAs) already found their way into medical education a long time ago and were first described by Olle Ten Cate in the 2000s [1]. They can be defined as units of professional practice that healthcare supervisors can fully entrust to trainees once they achieve sufficient levels of competency [2]. Since a competence describes the capability of a trainee and an EPA a workplace-based task, EPAs always require the integration of several competences. EPAs thus provide the opportunity to integrate competency-based education into the real clinical environment and to teach abstract competencies in this environment in a lively way [3].

Complete EPAs typically consist of the following elements, as proposed by Ten Cate et al [4]:

1. EPA Title: a short, informative description of the activity.
2. Specification and limitations: a clear indication of what is included in the EPA and what is not, as well as the context.
3. Information on potential risks in case of failure
4. Most relevant domains of competence: relation of the EPA to the competency framework used.
5. Required experience, knowledge, skills, attitude and behavior: tools and behaviors needed before being trusted to perform the EPA
6. Assessment information sources to assess progress and ground a summative entrustment decision: sources of information to determine progress
7. Entrustment for which level of supervision is to be reached at which stage of training: levels of training at which trainees can be trusted to carry out tasks in direct or indirect supervision
8. Expiration date: regular practice of EPA is needed, otherwise entrustment should drop

Meanwhile, EPAs are not only used in graduate medical education but also in undergraduate medical education and by many other health professional students such as dentistry, global health, physiotherapy or pharmaceutical education [5-8]. EPAs are also becoming more and more important in nursing education and EPA-sets are increasingly being developed in undergraduate nursing [9, 10]. Because of the ability of EPAs to frame competences in the context of clinical workplace activities, they set an appropriate standard for entry into undergraduate clinical placements [11]. This ultimately leads to better assessability and the transitions between different training stages can be better mapped. This creates a more accurate picture of the progress of the training stages. However, for academic nursing programs, it is unclear how many EPAs have been developed. Therefore, an overview of the current status regarding the development and implementation of EPAs in nursing education programmes is necessary.

The aim of this review is to provide an overview of EPAs in nursing education. The specific review questions are:

1. Which EPAs have been developed/proposed for nursing education?
2. Which EPAs have been implemented in nursing education?
3. What is the empirical evidence supporting any effects of implementing EPAs in nursing education programmes?

METHODS

Protocol and registration

The corresponding scoping review protocol was published previously [12]. The PCC framework (population, context, concept) was used to develop the three review questions mentioned above. The PCC framework makes it possible to formulate precise review questions in a methodologically clear way [13]. The reporting of this scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) [14].

Eligibility criteria

All articles or studies relating to EPAs and nursing were considered. In addition, the following inclusion criteria were applied:

(1) Publication period from the first mention of EPAs in 1995 up until 2023 (1 January 1995 to 31 December 2023)
(2) All languages
(3) All types of literature including descriptive studies, interventional studies, reviews and opinions if they clearly described EPAs
(4) All academic nursing education fields including undergraduate, postgraduate, nursing education and bachelor of science in nursing. Clinically based programmes if they present any EPAs used to train nursing students
(5) EPAs must be mentioned in the title or abstract

Information sources

Search strategies for the various databases were developed based on keywords relating to nursing education and EPAs, which were linked by Boolean operators. The search strategies were designed to cover the PCC framework with all acronyms and synonyms. After this, the following electronic databases were searched: MEDLINE and EMBASE via OVID, CINAHL and ERIC via EBSCO host [12]. The most recent search was executed on 22nd of March 2024.

Search

All search strings used are listed in Table 1.

Table 1: Search strings for electronic databases (1 January 1995-31 December 2023)

Databases	Searches
Medline and Embase combined search via OVID	((entrustable professional activit* or epa or epas) and (nursing education or nursing student* or nurs*)).ti, ab.
ERIC und CINAHL combined search via EBSCOhost	TI ((“entrustable professional activit*” or epa or epas)) AND AB ((“nursing education” or “nursing student*” or nurs*))

Selection of sources of evidence

Screening was conducted in a two-stage process. The first author screened all databases following the electronic search strategy. Duplicates were removed using the predefined settings in OVID and EBSCOhost. After this, all results were imported into EndNote and manually screened. The first author looked at all full texts and checked their suitability. All unsuitable articles were removed. A second reviewer looked at all articles independently and also removed all unsuitable articles. The result between the two was compared. In case of disagreement, a third reviewer was consulted.

Data charting process

Relevant article characteristics were extracted according to predefined criteria which is shown in Table 2. Identified EPAs were described separately in greater detail in a second table.

Data items

Extracted data are shown in table 2.

Table 2: Data charting variables/domains, according to the PCC Framework and best practice guidance and reporting items for the development of scoping review protocols [13]

PCC Elements	Item/domain	Description
	Year	Year of publication
	Author/s	List of all authors
	Publication type	Review, commentary, empirical study, other
	Study design	Descriptive, experimental
	Geographical location	Continent, country
Population	Setting	Type of school/institute/educational clinic
Context	Type of nursing programme	Undergraduate, postgraduate, bachelor of science in nursing or other type of academic programme/clinic
Concept	EPAs* characteristics	What are the EPAs described and how are they characterized?
	Title	Title of the EPA [4]
	Specifications	Included activities [4]
	Limitations	Excluded in the activity [4]
	Most relevant competency domains	Competency framework used to develop the EPAs [4]
	Implementation	Yes/no. If 'yes', when and how?

	Effects	Outcomes and effects
	Evidence supporting effects	Effect sizes

*EPAs, entrustable professional activities

Critical appraisal of individual sources of evidence

A critical appraisal and risk of bias assessment was not conducted.

Synthesis of results

A matrix was created in which the individual EPAs were compared with the subject areas and publications.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

Selection of sources of evidence

The search via Ovid initially resulted in 336 hits including duplicates, while EBSCOhost resulted in 26 hits including and excluding duplicates. After removing the duplicates, 224 hits remained for Ovid. Of these hits, 13 suitable articles remained (Figure 1). After completing the search, another article from 2024 was found to be suitable, which was included independently of the search. This gave a total of 14 included articles.

(Please insert Figure 1 here)

Characteristics of sources of evidence

Six articles described EPAs addressing General Nursing [9, 10, 15-18]. Seven articles described EPAs addressing specialties including critical care, surgical nursing, family nursing, hospice care, emergency care nursing, nursing telehealth and Adult Gerontology Primary care [19-25]. Most EPAs were from General Nursing by far. Most studies used qualitative designs [9, 10, 15-18, 20, 22, 23, 25]. Three studies used both qualitative and quantitative designs [19, 21, 24]. A more detailed description of the included articles can be seen in the supplementary material.

Results of individual sources of evidence

The described General Nursing EPAs included topics such as “Gather information and perform physical examination” [10], “Prioritize a Differential Diagnosis Following a Clinical Encounter” and “Document a Clinical Encounter in the Patient Record” [15], “Interprofessional collaboration” [9], “recognize and manage patients requiring urgent care” [17] or “Provide health education and nursing consultation” [18]. The described special nursing EPAs included topics such as “Performs manual opening and insertion of temporary airway maintenance devices” [20], “Assessing and Managing Patients with Acute Medical Presentations” [24] and “Integrated immediate postmortem and acute bereavement care” [25]. Most EPAs were not implemented [10, 15, 17-21, 23, 25]. When EPAs got implemented, following effects of implementation were described: EPAs are helping as a systematic assessment, fostering teamwork and critical thinking as well as providing flexibility in assessments, but there was still unclear assessment criteria, a lack of standardization and manpower and a change of mindset is needed to adapt to EPA skills [9]. Details of proposed EPAs are described in the Supplement.

Synthesis of results

In total, EPAs have been developed in 16 areas of nursing education (see Table 3).

Table 3: Matrix of synthesis of results (The articles were divided into general nursing and special nursing and mapped to the 16 areas of nursing education on the left. Number 1 means that EPAs have been developed in the respective area of nursing education, number 0 that none have been developed)

	General Nursing						Special Nursing							
	Al-Moteri, et al. 2021	Anthamatten et al. 2019	Lau et al. 2020	Mihaljevic et al. 2018	Zhou et al. 2022	Yang Yang et al. 2024	Li et al. 2022	Miranda et al. 2021	Moore et al. 2020	Surjadi, Saxe 2019	van Houwe-lingen et al. 2016	Chiang et al. 2022	Lai et al.2023	Sum
Health status assessment (incl. nursing admissions)	1	1	1	1	1	1	1	1	1	1	1	1	0	12
Diagnoses (prioritize nursing diagnoses, differential diagnoses)	1	1	0	0	0	1	1	0	1	1	1	0	0	7
Care measures	1	1	1	0	1	1	1	1	1	1	0	1	0	10
Care documentation	1	1	0	0	0	0	0	0	1	1	0	0	0	4
Care plans, protocols	1	0	0	1	1	1	1	0	0	1	1	0	0	7
Emergency /intensive care measures	1	1	1	0	1	1	1	1	0	0	0	0	0	7
(Psychological) support	1	0	1	0	0	0	0	0	0	0	1	0	0	3

Patient education, guidance	0	0	1	0	0	1	0	0	0	0	1	0	0	3
Joint decision-making	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Prevention and health promotion	1	0	0	0	1	0	0	0	0	0	1	0	0	3
Participation in diagnostics and/or therapy	0	1	0	0	1	1	1	1	1	0	1	0	0	7
Evidence-based work	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Communication (incl. patient handover and presentation)	0	1	0	0	0	1	1	0	1	1	0	1	0	6
Interprofessional work (incl. ward rounds, discharges)	0	1	1	1	0	1	1	1	0	0	0	0	0	6
Leadership/ Management	0	0	1	0	1	1	1	1	0	1	1	1	0	8
Palliative care	0	0	1	0	0	0	0	0	0	0	0	0	1	2

Most EPAs have been developed in the areas *Health status assessment* (n =12)*, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy.* The fewest EPAs were developed in the areas *Joint decision making, Evidence-based work* and *Palliative care.* EPAs were implemented in the following areas: *Health status assessment (incl. nursing admissions), Care measures, Emergency/intensive care measures, Patient education and guidance, Prevention and health promotion, Communication (incl. patient handover and presentation), Interprofessional work (incl. ward rounds, discharges), Leadership/Management, Palliative care*.

DISCUSSION

Our scoping review results indicate that EPAs have been developed for 16 different areas of the care process. There appear to be considerable similarities within the EPAs *Health status assessment, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy* across different studies. This indicates that there seems to be some kind of agreement about core EPAs in nursing education which is similar the widely used nursing process consisting of the components Assessing, Diagnosing, Planning, Implementing and Evaluating which reflects in the nursing diagnoses of the *NANDA-I-taxonomy* [26]. Thus, the development of EPAs so far clearly follows the internationally established care process, which includes both care in the narrower sense and medical action. Both positive experiences and challenges are described during the implementation process. Nursing education appears to follow medical education, where a large number of EPAs exists today [27].

However, although EPAs seem to offer advantages compared to competency-based frameworks [28], empirical evidence supporting these assumptions is low. EPAs seem to offer a good opportunity to facilitate the process of transferring competencies into clinical practice. However, when looking closely at the extracted EPA characteristics and competency domains there seems to be overlaps between less and more complex competencies defining the EPAs. In addition, it is still unclear whether EPAs actually lead to better clinical performance outcomes compared to competency-based training. We are unable to identify robust evidence or study designs, to evaluate the effects of EPAs.

Overall, EPAs on essential and fundamental aspects of the nursing process (e.g. health status assessment, care measures, care plans) are developed independently by different authors. On the other hand, there are special EPAs such as those for palliative care that seem to be unique. However, it is also shown that EPAs are not always named as such. For example, *Ramirez et al.* list "Knowledge and Task Practice Standards for the Emergency Nurse Practitioner", which are similar to EPAs [29]. The partly inconsistent naming of EPAs must surely be regarded as an impeding factor in the further dissemination and implementation of nursing EPAs.

Our review results indicate, that not all of the eight elements of a complete EPA (see introduction) specified by Ten Cate et al. [4] are always fully specified for developed EPAs. In most cases, the title, specifications and competency domains are given, whereas in particular the supervision level and assessment information are rarely listed. This is currently leading to an emerging discrepancy between the ideal depth of an EPA and the actual quality of developed nursing EPAs. To counteract this development, the "EQual" scoring rubric [30] has been established in medicine for some time now. This provides a standardized opportunity for internal validation and for identifying EPAs that are insufficiently developed with regard to, among other aspects, the propagated EPA elements. This structured evaluation might be useful to develop and validate state-of-the-art EPAs in nursing education in the future.

Limitations

Since not all published EPAs are clearly designated as such, we may have missed other published frameworks similar to EPAs. In addition, maybe other search strings should have been used such as “nurse education”. Furthermore, no risk of bias assessment was conducted and no information about individual study limitations was extracted because scoping reviews systematically identity and map the breath of evidence available on a particular topic [31]. Evaluation of the quality of evidence requires a systematic review approach.

Conclusions

EPAs become more and more popular in nursing education. They largely cover the key steps of the nursing process but also address advanced and specialty topics.

The fact that EPAs are now increasingly being used and implemented in nursing curricula raises the question whether EPAs actually improve nursing education. In addition, the extent to which the achievement of objectives in nursing education is actually improved by EPAs should be further investigated as well.

Data availability statement

All collected data are presented in this work.

Author Contributions

JP is the guarantor for this manuscript. Conceptualisation and design of study: JP, JK and AM. Collected and reviewed data: JP, JK and AM. Wrote the manuscript: JP, AM and JK. All authors revised and approved the manuscript.

Patient consent for publication

Not commissioned; externally peer reviewed

Words

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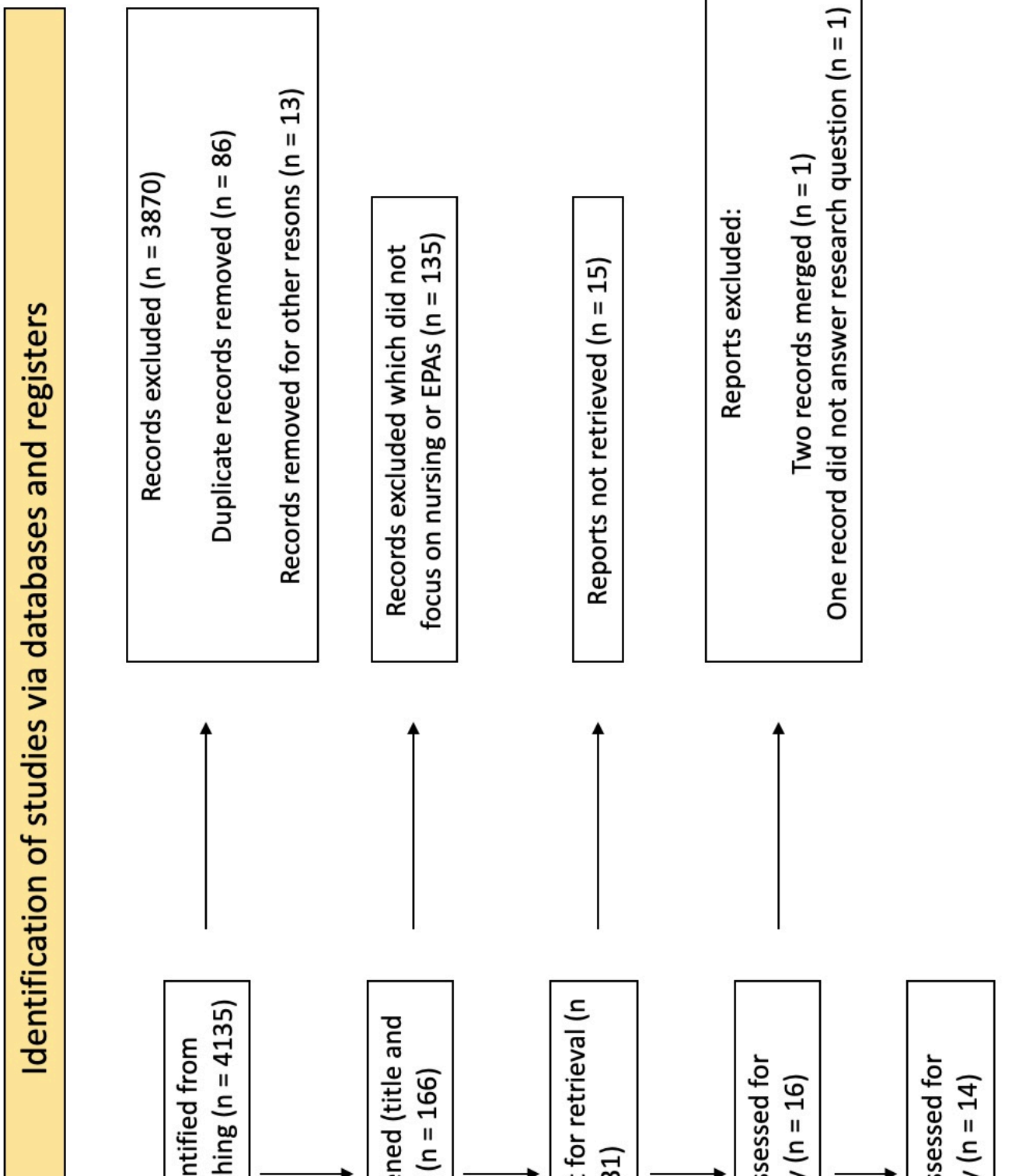
Figure legends

Figure 1: Flow diagram on the results of the screening process



SUPPLEMENT

Description of included articles:

Nr	Authors	Year	Title	Publication type	Study design	Results regarding EPAs	Geo-graphic location	Setting	Type of nursing program
1	Al-Moteri, Youssef, Elryah, et al	2021	Development of undergraduate nursing entrustable professional activities through using a participatory design approach	Empirical study	Qualitative	Development of 8 core EPAs, including descriptions and competency domains	Saudi Arabia, Asia	General nursing	BSc Nursing
2	Anthamatten, Richmond, Glassford	2019	Exploring the Utility of Entrustable Professional Activities as a Framework to Enhance Nurse Practitioner Education	Empirical study	Qualitative	Several medical EPAs and their competencies were matched to nurse practitioner competency domains	USA, North America	General nursing	MSc Nursing
3	Lau, Samarasekera, Shorey	2020	Evaluation of an undergraduate nursing entrustable professional activities framework : An exploratory qualitative research	Empirical study	Qualitative	EPAs developed and discussed based on Singapore Nursing Board (2018) competencies	Singapore, Asia	General nursing	BSc Nursing BSC Nursing Honors
		2020	Development of undergraduate nursing entrustable professional activities to enhance clinical						

			care and practice						
4	Li, Tekin, Cui, et al	2022	A novel multimodal needs assessment to inform the longitudinal education program for an international interprofessional critical care team	Empirical study	Qualitative and quantitative	Development of 20 EPA statements describing essential critical care EPAs	China, Asia	Critical care	Not described
5	Mihaljevic, Mitzkat, Probst, et al	2018	Heidelberger Interprofessionelle Ausbildungsstation (HIPSTA): a practice- and theory-guided approach to development and implementation of Germany's first interprofessional training ward	Empirical study	Qualitative	Development of curriculum including EPAs to be used as learning goals for an interprofessional training ward for nurses and physicians	Germany, Europe	General nursing	BSc (Interprofessional Healthcare)
6	Miranda, Mazzo	2021	Competences in the training of nurses to assist the airway of adult patients in urgency and emergency situations	Empirical study	Qualitative	Development and validation of EPAs and their competencies for training nurses	Brazil, South America	Surgical nursing	MSc Nursing (Medical-Surgical Nursing)
7	Moore, Hawkins-Walsh	2020	Evaluating Nurse Practitioner Student Competenc	Empirical study	Qualitative and quantitative	Successful evaluation of pilot EPAs to assess student clinical competence,	USA, North America	Family Nursing	MSc Nursing (Family Nursing

			ies: Application of Entrustable Professional Activities			according to faculty and student responses (70% found EPA descriptions useful or requiring minor editing in assessing students)			Practitioner)
9	Surjadi, Saxe	2019	Entrustable Professional Activities in Nurse Practitioner Education	Empirical study	Qualitative	Evaluation of standardized clinical evaluation tool that includes EPA-focused assessment process	USA, North America	Adult Gerontology Primary Care	MSc Nursing (Adult Gerontology Primary Care Nurse Practitioner)
10	van Houwelingen, Ettema, Kort, et al	2016	Competencies required for nursing telehealth activities: A Delphi-study	Empirical study	Qualitative	Consensus via Delphi study on 14 nurse telehealth EPAs, identified 52 competencies for telehealth	Netherlands, Europe	Nursing telehealth	Not applicable
11	Zhou, Poh, Chan et. al	2022	Development of entrustable professional activities for advanced practice nurses education.	Empirical study	Qualitative	Development and pilot testing of nine core EPAs	Singapore, Asia	General nursing	Advanced practice nurse (APN) education
12	Chiang, Yu, Chung et. al	2022	Implementing an entrustable professional activities programmatic assessment for nurse practitioner training in emergency care: A pilot study.	Observational study	Qualitative and quantitative	Development of four nested EPAs for emergency care nurse practitioners	Taiwan, Asia	Emergency care nursing	Nurse practitioner training program
13	Lai, Liu, Chen, Anna	2023	Integrated immediate postmortem and acute bereavement care:	Empirical study	Qualitative	Identification of four major EPA components and three essential competencies as highly correlated to those	Taiwan, Asia	Hospice care	Not described

			Competency-based entrustable professional activities for nursing.			components concerning immediate postmortem and acute bereavement care			
14	Yang Yang, Yue Hana, Huan Xu et. al	2024	Development of the core competency-based entrustable professional activities for Master of Nursing Specialist (MNS) graduates in China	Empirical study	Qualitative	Development and evaluation of 12 EPAs for Chinese Master of Nursing Specialists graduates	China, Asia	General nursing	Master of Nursing Specialist (MNS) graduates

Details of described EPAs:

Article 1: Al-Moteri M, Youssef HAM, Elryah AAI, Yaseen RWH, Begum F, Abdelgadir WI, et al. Development of undergraduate nursing entrustable professional activities through using a participatory design approach. J Prof Nurs. 2021;37(4):741-8.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Gather information and perform physical examination	Perform complete, focused and an ongoing patient/family/community including history taking, physical examination and interpret diagnostic test	Competency domains developed for all EPAS: 1. Evidence based practise 2. Critical thinking and problem solving 3. Communication 4. Patient centred care 5. Professionalism 6. Leadership and responsibility	No	Not described	Not described	
EPA 2: Formulate and prioritize nursing diagnoses	Analyze patient/family/community data, identify health problems, formulate and prioritize nursing diagnoses					
EPA 3: Formulate and implement care plan	Formulate goals and outcomes that directly impact the care of patient/family/community, with all different					

	types of health problems, issues and conditions, where the required interventions guided by evidence-based practice are carried-out	7. Information technology 8. Quality of care and patient safety 9. Nursing knowledge and clinical skills				
EPA 4: Perform general clinical procedures	Perform invasive and non-invasive clinical procedures that are universal among registered nurses					
EPA 5: Recognize conditions requiring emergent care	Identify signs and symptoms of patient/family/community clinical/physical/mental deterioration that need immediate attention and rapid response					
EPA 6: Apply comfort and psychological support	Identify and apply psychological support to all concerns with emotional wellbeing of the patient/family/community, including issues of self-esteem, insight into adaptation to their illness and its consequences.					
EPA 7: Promote health and prevent disease	Enable patient/family/community to increase control over and to improve their health and physical capacity					
EPA 8: Reporting patient condition and documenting care	Document and report pertinent patient information, care provided, physical/psychosocial responses of patient/family/community to nursing intervention and progress toward problem resolution					

Article 2: Anthamatten A, Pfieffer ML, Richmond A, Glassford M. Exploring the Utility of Entrustable Professional Activities as a Framework to Enhance Nurse Practitioner Education. Nurse Educ. 2020;45(2):83-7.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Gather a History and Perform a Physical Examination EPA 2: Prioritize a Differential Diagnosis Following a Clinical Encounter EPA 3: Recommend and Interpret Common Diagnostic and Screening Tests EPA 4: Enter and Discuss Orders and Prescriptions EPA 5: Document a Clinical Encounter in the Patient Record EPA 6: Provide an Oral Presentation of a Clinical Encounter EPA 7: Form Clinical Questions and Retrieve Evidence to Advance Patient Care EPA 8: Give/Receive a Patient Handover to Transition Care Responsibility EPA 9: Collaborate as a Member of an		Not described	No	Not implemented yet	Not described	

Inter-professional Team EPA 10: Recognize a Patient Requiring Urgent/Emergent Care and Initiate Evaluation and Management						

Article 3: Lau ST, Ang E, Samarasekera DD, Shorey S. Development of undergraduate nursing entrustable professional activities to enhance clinical care and practice. Nurse Educ Today. 2020;87:104347.

EPA Title	**EPAs Characteristics**	**Competency Domains**	**Implemented?**	**Effects/Results**	**Evidence Supporting Effects**	**Comments**
EPA 1: Patient Engagement	Engage patients, families, or caregivers to enhance the patient's experience	1. Communication 2. Knowledge application 3. Health assessment 4. Nursing process 5. Critical thinking/problem solving skills 6. Reflective practice 7. Documentation 8. Interpersonal skills	Yes Implemented in two phases starting December 2017 and ending in May 2018	Themes identified from focus groups: Positive effects: EPAs helping as a systematic, comprehensive assessment of holistic patient care; fostering teamwork and critical thinking; as well as providing flexibility in assessments. Negative effects: unclear assessment criteria; change of mindset needed to adapt to EPA skills; lack of standardization; lack of manpower and time constraints.	Systematic assessment: "it gives you like a structure to perform your clinical activity"	
EPA 2: Patient care and practice	Prioritize and provide patient care utilizing nursing practice standards					
EPA 3: Care management	Perform comprehensive health assessments and deliver and evaluate care for patients				Critical thinking: "…it forces us to think critically. Because like, its good in the sense like oh okay, to care for patient, there is a lot of aspect and EPA is all these things…"	
EPA 4: Common procedures	Perform procedures (e.g. verify a doctor's/nurse's order from a medical record or provide the appropriate emotional support to a patient) required of a registered nurse				Flexibility: Hosp CI: "…we use peer teaching, sometimes we break them into small groups, we have small group discussions…" (AHFGD2)	
EPA 5: Safety	Deliver care utilizing patient safety standards				Unclear criteria:	

EPA 6: Urgent care	Recognize patients requiring emergency care, initiate management, assist in resuscitation, and stabilize critically ill patients				"You know if you need CI's help half the time it is entrustment level 3, if you need me for help for 75% of the time it is a level 2. But the variable here is how the how the CI determine help needed?"	
EPA 7: Transition care	Lead health care professionals in transiting patients within and between teams				Mindset change: "OT (operating theatre) I will admit is a bit hard because some of the competency also not there. The patient lying at the table, what EPA assessment are you really going to do?"	
EPA 8: Patient education	Conduct education for patients, families, or caregivers to improve health through health promotion and disease prevention					
EPA 9: Interprofessional collaboration	Collaborate with interprofessional teams to improve the quality of healthcare				Lack of standardization: "there was a bit of discrepancy in terms of the teaching cos of the ward culture…"	
EPA 10: Palliative care	Perform assessments and deliver and evaluate care for patients requiring palliative or end-of-life care in the hospital or community				Lack of manpower/time constraints: "mainly it's the CI who assess us, but the CI don't really have a lot of time also. So, sometimes they will just ask the staff like how we did and stuff. Then, they will just base on their feedback."	

Article 4: Li H, Sun Y, Barwise A, Cui W, Dong Y, Tekin A, et al. A novel multimodal needs assessment to inform the longitudinal education program for an international interprofessional critical care team. BMC Med Educ. 2022;22(1):540.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
	EPA 1: Evaluate and manage patients presenting with acute respiratory failure, including early recognition, diagnostic evaluation, and treatment of most likely causes including pneumonia, obstructive lung disease exacerbation, congestive heart failure, pulmonary embolism and tension pneumothorax.	1. Organ support and disease management 2. Practical skills 3. Quality improvement 4. Patient-centered care and communication 5. Interprofessional skills	No	Not described	Not described	Abstract mentions development of essential critical care EPAs but no further details provided
	EPA 2: Evaluate and manage patients with sepsis and septic shock, including early recognition, resuscitation, appropriate antibiotics, and systematic evaluation for source control.					
	EPA 3: Evaluate and manage common nephrology conditions in the ICU, including acute kidney injury, renal replacement therapy, and acid base and electrolyte disorders.					
	EPA 4: Provide compassionate, patient-centered care, engaging with patients and family members in shared decision making using collaborative communication skills, empathy, and respect.					
	EPA 5: Evaluate and manage patients presenting with acute common cardiovascular conditions, including arrhythmias, acute coronary syndromes, valvular heart disease,					

	congestive heart failure, and vascular emergencies.					
	EPA 6: Evaluate and manage patients with shock, including early recognition, rapid diagnostic evaluation, and targeted treatment of cardiogenic, hypovolemic/hemorrhagic, distributive and obstructive shock, including targeted vasopressor management.					
	EPA 7: Evaluate and manage patients presenting with poisoning or overdose, including complications of alcohol, drug intoxication and withdrawal.					
	EPA 8: Evaluate and manage common gastroenterology conditions in the ICU, including acute gastrointestinal hemorrhage, difficile colitis, bowel obstruction and perforation, complications of hepatobiliary disease, and pancreatitis.					
	EPA 9: Evaluate and manage common hematology and oncology conditions in the ICU, including coagulopathy, acute/massive hemorrhage, common malignancies and their associated complications.					
	EPA 10: Evaluate and manage common neurologic conditions in the ICU, including encephalopathy,					

	congestive heart failure, and vascular emergencies.					
	EPA 6: Evaluate and manage patients with shock, including early recognition, rapid diagnostic evaluation, and targeted treatment of cardiogenic, hypovolemic/hemorrhagic, distributive and obstructive shock, including targeted vasopressor management.					
	EPA 7: Evaluate and manage patients presenting with poisoning or overdose, including complications of alcohol, drug intoxication and withdrawal.					
	EPA 8: Evaluate and manage common gastroenterology conditions in the ICU, including acute gastrointestinal hemorrhage, difficile colitis, bowel obstruction and perforation, complications of hepatobiliary disease, and pancreatitis.					
	EPA 9: Evaluate and manage common hematology and oncology conditions in the ICU, including coagulopathy, acute/massive hemorrhage, common malignancies and their associated complications.					
	EPA 10: Evaluate and manage common neurologic conditions in the ICU, including encephalopathy,					

	seizure, stroke, and intracranial hemorrhage.					
	EPA 11: Identify, evaluate and manage patients with ARDS, collaborating with Respiratory Therapy and utilizing institutional protocols to deliver safe and effective lung protective ventilation, rapidly identify patients with refractory hypoxemia, and appropriately employ early liberation strategies.					
	EPA 12: Resuscitate and stabilize critically ill patients, performing necessary diagnostic and therapeutic interventions in a timely manner and effectively coordinating care with the interprofessional critical care team and appropriate consultants.					
	EPA 13: Safely and efficiently perform procedures common to the practice of critical care medicine, and demonstrate understanding of indications, contraindications, limitations, and complications of these interventions.					
	EPA 14: Diagnose and manage acute pain in critical illness and the perioperative setting, including appropriate use of opioids, non-opioid analgesics, and assessment scales.					
	EPA 15:					

	Evaluate and manage common critical care infections, including meningitis/encephalitis, pneumonia, catheter related bloodstream infections, simple and complicated biliary, urinary tract, skin and soft tissue infections, and opportunistic pathogens commonly seen in immune compromised hosts.					
	EPA 16: Professional, respectful and timely in the execution of all clinical activities, with appropriate communication and collaboration within interprofessional team.					
	EPA 17: Ensures effective transitions of care through consistent, concise communication of patient care plans and recommendations.					
	EPA 18: Leads efficient and effective ICU rounds by soliciting and incorporating collaborative input from the interprofessional team, appropriate consulting services, patients and families to develop a well-organized, appropriate plan of care.					
	EPA 19: Efficiently employ critical care protocols and checklists to prevent common critical care complications, and effectively diagnose and manage delirium, venous thromboembolism, nosocomial infections, malnutrition, hyperglycemia,					

	decubitus ulcers, and musculoskeletal complications.					
	EPA 20: Evaluate and manage perioperative patients and common post-surgical complications.					

Article 5: Mihaljevic AL, Schmidt J, Mitzkat A, Probst P, Kenngott T, Mink J, et al. Heidelberger Interprofessionelle Ausbildungsstation (HIPSTA): a practice- and theory-guided approach to development and implementation of Germany's first interprofessional training ward. GMS J Med Educ. 2018;35(3):Doc33.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Interprofessional surgical ward round	Conduct interprofessional ward rounds of postoperative patients on HIPSTA and jointly prepare an interprofessional plan for further diagnostic, therapeutic, nursing and rehabilitative treatment of the patient	Competency Domains derived from CanMeds/NKLM (Nationaler Kompetenzorien-tierter Lernzielkatalog). EPA 1: Medical expert, Communicator, Collaborator, Leader/manager, Professional	Yes	Not described	Not described	
EPA 2: Interprofessional patient admission	Perform an interprofessional preoperative admission of a patient to a surgical ward	EPA 2: Medical expert, Communicator, Member of a team, Leader/manager, Professional				
EPA 3: Interprofessional discharge management	To manage the discharge of a surgical patient together as an interprofessional team from the acute care setting to the subsequent health care sector (e.g. home, nursing home, rehabilitation centre) considering the individual needs of the patient as well as the intersectoral characteristics of the health care system	EPA 3: Medical expert, Communicator, Member of a team, Leader/manager, Professional				

Article 6: Miranda FBG, Alves Pereira-Junior G, Mazzo A. Competences in the training of nurses to assist the airway of adult patients in urgency and emergency situations. Rev Lat Am Enfermagem. 2021;29:e3434.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Briefly performs an anamnesis and focused physical examination of the airway	Knows the anatomy and physiology of the upper and lower airways; performs targeted anamnesis and physical examination, and associates anamnesis and physical examination with possible Nursing diagnoses.	Scientific knowledge, Technical skill (manual dexterity), Communication, Decision-making, Clinical reasoning	No	Not described	Not described	Described in the article as competence framework, these are actually descriptions
EPA 2: Performs manual opening and insertion of temporary airway maintenance devices	Identifies and describes signs and symptoms of airway impairment; recognizes needs and priorities in the development of actions relevant to forecasting devices, materials, and equipment needed to clear the airways; performs the manual airway opening techniques of head tilt-chin lift, jaw-thrust, and chin lift; performs the insertion techniques of temporary oropharyngeal cannula (Guedel) or nasopharyngeal cannula; and describes indications and contraindications for the use of these devices	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Decision-making, Clinical reasoning				
EPA 3: Recognizes the need for and the conduction of an intervention in airway aspiration	Recognizes the need and aspirates the airways with the type of material appropriate to the patient's clinical case, performs the pulse oximetry insertion techniques to check peripheral capillary oxygen saturation, identifies factors (distal perfusion, low temperature, lesions, etc.) that can make it	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Decision-making, Clinical reasoning				

	difficult to read peripheral capillary oxygen saturation in the oximeter, and applies the principles of biosafety in patient care with compromised airway					
EPA 4: Collaborates or performs the insertion of supraglottic airway devices	Collaborates or performs the insertion of supraglottic airway devices	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Team work, Decision-making, Clinical reasoning, Safety				
EPA 5: Identifies, intervenes and indicates or contraindicates the techniques of advanced maneuvers to control the airway.	Identifies, intervenes and indicates or contraindicates the techniques of advanced maneuvers to control the airway.	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Team work, Decision-making, Clinical reasoning, Safety				
EPA 6: Collaborates with the team to perform advanced maneuvers to control the airway	Collaborates with the team to perform advanced manoeuvres to control the airway	Scientific knowledge, Technical skill (manual dexterity), Inter-professional communication, Decision-making, Clinical reasoning, Leadership				

Article 7: Moore J, Hawkins-Walsh E. Evaluating Nurse Practitioner Student Competencies: Application of Entrustable Professional Activities. J Nurs Educ. 2020;59(12):714-20.

EPA Title	**EPAs Characteristics**	**Competency Domains**	**Implemented?**	**Effects/Results**	**Evidence Supporting Effects**	**Comments**
EPA 1a: Gather a history	Obtain a complete and accurate history in an organized fashion. Demonstrate patient-centered interview skills. Demonstrate clinical reasoning in gathering focused information relevant to a patient's care.	Not described	No	Not described	Not described	
EPA 1b: Perform a physical Examination	Perform a clinically relevant, appropriately thorough physical examination pertinent					

	to the setting and purpose of the patient visit. Demonstrate clinical reasoning in gathering focused information relevant to a patient's care.					
EPA 2: Prioritize a differential diagnosis following a clinical encounter	Synthesize essential information from previous records, history, physical examinations, and initial diagnostic evaluations to propose a scientifically supported differential diagnosis. Prioritize and continue to integrate information as it emerges to update differential diagnosis, while managing ambiguity. Engage and communicate with team members for endorsement and verification of the working diagnosis that will inform management plans.					
EPA 3: Recommend and interpret common diagnostic and screening tests	Recommend first-line, cost-effective screening and diagnostic tests for routine health maintenance and common disorders. Provide rationale for decision to order tests, taking into account pre- and post-test probability and patient preference. Interpret results of basic studies and understand the implication and urgency of the results.					
EPA 4: Enter and discuss orders and prescriptions	Compose orders efficiently and effectively on paper, verbally, and electronically. Demonstrate an understanding of the patient's condition that underpins the provided orders. Recognize and avoid errors by attending to patient-					

	specific factors using resources, and appropriately responding to safety alerts. Discuss planned orders and prescriptions with team, patients, and families.					
EPA 5: Document a clinical encounter in the patient record	Prioritize and synthesize information into a cogent narrative. Follow documentation requirements to meet regulations and professional expectations. Document a problem list, differential diagnosis, and plan supported through clinical reasoning that reflects the patient's preferences.					
EPA 6: Provide an oral presentation of a clinical encounter	Present personally gathered and verified information, acknowledging areas of uncertainty. Provide an accurate, concise, well-organized oral presentation. Adjust the oral presentation to meet the needs of the receiver. Demonstrate respect for patient's privacy and autonomy.					

Article 9: Surjadi M, Stringari-Murray S, Saxe JM. Entrustable Professional Activities in Nurse Practitioner Education. The Journal for Nurse Practitioners. 2019;15(5):e97-e102.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA: Independence in Clinical Practice		1. Information gathering/interviewing skills 2. Physical examination Logical sequence and appropriate physical examination maneuvers 3. Clinical judgment/assessment 4. Management plan 5. Professionalism 6. Overall clinical competence	Yes	"Student Performance Evaluations (2016-2018) examples: Complete symptom description increased from a mean of 4.08 to 4.69 Accurate collection of patient's history increased from a mean of 4.28 to 4.79 Evidenced based therapeutic interventions increased from a mean of 3.86 to 4.76 Care coordination and patient, family, and caregiver advocacy increased from a mean of 3.17 to 4.87 Demonstrates cost and efficiency considerations in patient care increased from a mean of 2.6 to 4.83"	Milestones and competencies were evaluated based on a revised EPA evaluation tool, which showed favorable results in ease of completion of the tool for faculty, preceptors, and students	This article focuses on the development and evaluation of an EPA assessment tool for measuring leaner performance

Article 10: van Houwelingen CT, Moerman AH, Ettema RG, Kort HS, Ten Cate O. Competencies required for nursing telehealth activities: A Delphi-study. Nurse Educ Today. 2016;39:50-62.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Support patients	Supporting patients in the use of technology	Coaching skills, the ability to combine clinical experience with telehealth, communication skills, clinical knowledge, ethical awareness, and a supportive attitude	No	Not yet implemented	Not described	Contains comprehensive list of Skills, Knowledge, and Attitudes for each Nursing Telehealth EPA
EPA 2: Train patients	Training patients in the use of technology as a way to strengthen their social network preoperative admission of a patient to a surgical ward					
EPA 3: Health promotion	Providing health promotion remotely					
EPA 4: Triaging	Triaging incoming calls and alarms					
EPA 5: Data analysis	Analyzing and interpreting incoming data derived from (automatic) devices for self-measurement					
EPA 6: Monitoring	Monitoring body functions and lifestyle					
EPA 7: Psychosocial support	Providing psychosocial support					
EPA 8: Encouraging	Encouraging patients to undertake health promotion activities					
EPA 9: Instructing	Instructing patients and family care givers in self-care					
EPA 10: Assessing	Assessing patient capacity to use telehealth					
EPA 11: Evaluating	Evaluating and adjusting the patient care plan					
EPA 12: Coordinating	Coordination of care with the use of telehealth technology					
EPA 13: Double-check	Independent double-check of high-risk medication					
EPA 14: Peer consultation	Guidance and peer consultation					

Article 11: Zhou W, Poh CL, Chan HL, Shorey S. Development of entrustable professional activities for advanced practice nurses education. Nurse Educ Today. 2022;116:105462.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Perform an initial assessment and formulate management plans		Sub-competencies of clinical practices: P1 respect the values, customs, spiritual beliefs and practices of individuals and groups P2 Demonstrate responsibility and accountability within the scope of practice and level of competence P3 Apply key principles of SNB's code for Nurses and Midwives for ethical decision making P4 Practise in accordance with institutional/national legislation, policies and procedural guidelines P5 Ensure own physical, cognitive, psychological & emotional fitness to practice and deliver safe care P6 Aware of one's own knowledge, skill, beliefs, value and emotional limitations that leads to appropriate help-seeking behaviours P7 Recognize clinical ambiguity and utilize appropriate resources in dealing with uncertainty	No	Not yet implemented	Despite the stakeholders having generally positive attitudes towards the use of EPAs, it has its drawbacks. Additionally, the described set of core APN EPAs needs more refinement and rigorous testing before it can be implemented on a larger scale	
EPA 2: Manage follow-up care for a clinical encounter						
EPA 3: Plan, perform and evaluate care procedures						
EPA 4: Recognise and manage patients requiring urgent care						
EPA 5: Manage care transitions within and between health care organisations						
EPA 6: Recognise and manage pharmacological needs of patients						
EPA 7: Collaborate with patients, families, and community to improve health through disease prevention and health promotion						
EPA 8: Participate in health quality improvement initiative						
EPA 9: Develop self and others for						

professional practice.						

Article 12: Chiang YH, Yu HC, Chung HC, Chen JW. Implementing an entrustable professional activities programmatic assessments for nurse practitioner training in emergency care: A pilot study. Nurse Educ Today. 2022;115:105409.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Assessing and Managing Patients with Acute Medical Presentations	Collecting medical history Performing basic physical examinations Arranging and interpreting diagnostic tests Establishing medical orders under the instruction of attended physician Completing medical record Communicating health care plan and obtaining informed consent Identify critically ill patient Counseling and health education	1. Patient care 2. Medical knowledge 3. System-based practice 4. Professionalism 5. Practice-based learning/improvement 6. Interpersonal communicating skills 7. Personal and professional development	Yes	- Novice nurse practitioners (n = 8) were assessed once per week by nurse practitioner leader and two physicians - Increase of average supervision entrustment score in EPA1 (p = 0.011) - No differences in EPA 2, 3, 4 - Longest time required for novice nurse practitioners to achieve a stable level 5 entrustability score for at least 3 consecutive months for EPAs 1, 2, 3, and 4 was 18, 11, 11, and 8 months	Not described	
EPA 2: Performing Basic Procedures	Obtaining informed consent Evaluation before execution Operating skills Evaluation and confirmation after the procedures Providing health education					
EPA 3: Communicating Consultations/Referrals	Monitoring the progress of the patient's condition Seeking consultation/referral resources Communicating with members of					

	consulting/referral subspecialties Facilitating appropriate patient care using consultation/referral information					
EPA 4: Providing and Receiving the Handover in the Transition of Care	Integrating shift information Performing oral handover Receiving messages and asking questions Ensuring complete referral patient's information					

Article 13: Lai WS, Liu LC, Chen HM, Anna A. Integrated immediate postmortem and acute bereavement care: Competency-based entrustable professional activities for nursing. Nurse Educ Today. 2023;126:105812.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA: Integrated immediate postmortem and acute bereavement care	Assist with postmortem care and provide appropriate care and support to bereaved family members experiencing acute grief Four essential EPA components: 1. Cultural and religious ritual assessment 2. Death preparation 3. Postmortem care 4. Acute bereavement care	General clinical skills; Communication and teamwork capabilities; Caring	No	Not yet implemented	Not described	Contains comprehensive list of Skills, Knowledge, Attitudes and experiences

Article 14: Yang Y, Han Y, Xu H, Wang T, Li Z, Huang K, et al. Development of the core competency-based entrustable professional activities for Master of Nursing Specialist (MNS) graduates in China. Med Teach. 2024:1-9.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments

EPA 1: Perform health assessments		1. Knowledge acquisition 2. Clinical practice 3. Communication 4. Scientific thinking and clinical research 5. Clinical management and coordination 6. Other competencies	No	Not yet implemented	Not described	
EPA 2: Identify and prioritize nursing diagnoses						
EPA 3: Formulate and implement care plan						
EPA 4: Perform basic and specialized care operations						
EPA 5: Recognize and manage medication needs of patients						
EPA 6: Assess and manage patients with mental health problems						
EPA 7: Recognize and assist in rescuing critically ill patients						
EPA 8: Perform transition and handover						
EPA 9: Participate in multidisciplinary team collaborative care						
EPA 10: Provide health education and nursing consultation						
EPA 11: Formulate and implement discharge plans						
EPA 12:						

Instruct nursing students in a clinical setting						

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Entrustable professional activities in nursing education: a scoping review

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ABSTRACT

Objectives: Entrustable professional activities (EPAs) have been used in undergraduate and graduate medical education and in other health professions for a long time. They are regarded as a suitable way for bridging the gap between competency-based education and actual work tasks in the workplace. In nursing education, EPA development started later and it is unclear which EPAs have been developed and implemented yet. This scoping review aims to identify which EPAs have been developed in nursing education, which of these have even been implemented and what the empirical evidence is supporting any effects of implementation.
Design: Scoping Review using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).
Data sources: MEDLINE and EMBASE via OVID, CINAHL and ERIC via EBSCOhost were searched for the period 1 January 1995 to 31 December 2023.
Eligibility criteria: Publication period from the first mention of EPAs in 1995 up until 2023, no language restrictions, all types of literature if they had a clear mention of EPAs, all academic nursing education fields, EPAs had to be mentioned in the title or abstract.
Data extraction and synthesis: Screening was conducted in a two-stage process with two authors. Thirteen suitable articles were included which describe either the development, implementation or assessment of EPAs.
Results: Results indicated that EPAs have been developed in 16 areas of nursing education, including special areas such as palliative care or emergency/intensive care. The activities *Health status assessment, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy* were described most often. In four out of 13 cases EPAs were implemented. Described evidence indicated that the use of EPAs improved critical thinking, promotes flexibility in teaching and led to a mindset change.
Conclusions: EPAs are increasingly developed and implemented in nursing education. There seem to be overlaps between EPAs mainly covering the steps of the nursing care process.

Strengths and limitations of this study

- The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) was followed
- A comprehensive and systematic map of Entrustable professional activities is presented
- Articles might have been missed because EPAs were not clearly designated as such.
- A critical appraisal of the quality of the evidence was not conducted.

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Competing interests

None declared.

INTRODUCTION

Entrustable professional activities (EPAs) already found their way into medical education a long time ago and were first described by Olle Ten Cate in the 2000s [1]. They can be defined as units of professional practice that healthcare supervisors can fully entrust to trainees once they achieve sufficient levels of competency [2]. Since a competence describes the capability of a trainee and an EPA a workplace-based task, EPAs always require the integration of several competences. EPAs thus provide the opportunity to integrate competency-based education into the real clinical environment and to teach abstract competencies in this environment in a lively way [3].

Complete EPAs typically consist of the following elements, as proposed by Ten Cate et al [4]:

1. EPA Title: a short, informative description of the activity.
2. Specification and limitations: a clear indication of what is included in the EPA and what is not, as well as the context.
3. Information on potential risks in case of failure
4. Most relevant domains of competence: relation of the EPA to the competency framework used.
5. Required experience, knowledge, skills, attitude and behaviour: tools and behaviours needed before being trusted to perform the EPA
6. Assessment information sources to assess progress and ground a summative entrustment decision: sources of information to determine progress
7. Entrustment for which level of supervision is to be reached at which stage of training: levels of training at which trainees can be trusted to carry out tasks in direct or indirect supervision
8. Expiration date: regular practice of EPA is needed, otherwise entrustment should drop

Meanwhile, EPAs are not only used in graduate medical education but also in undergraduate medical education and by many other health professional students such as dentistry, global health, physiotherapy or pharmaceutical education [5-8]. EPAs are also becoming more and more important in nursing education and EPA-sets are increasingly being developed in undergraduate nursing [9, 10]. Because of the ability of EPAs to frame competences in the context of clinical workplace activities, they set an appropriate standard for entry into undergraduate clinical placements [11]. This ultimately leads to better assessability and the transitions between different training stages can be better mapped. This creates a more accurate picture of the progress of the training stages. However, for academic nursing programs, it is unclear how many EPAs have been developed so far. Therefore, an overview of the current status regarding the development and implementation of EPAs in nursing education programmes is necessary.

The aim of this review is to provide an overview of EPAs in nursing education. The specific review questions are:

1. Which EPAs have been developed/proposed for nursing education?
2. Which EPAs have been implemented in nursing education?
3. What is the empirical evidence supporting any effects of implementing EPAs in nursing education programmes?

METHODS

Protocol and registration

The corresponding scoping review protocol was published previously [12]. The PCC framework (population, context, concept) was used to develop the three review questions mentioned above. The PCC framework makes it possible to formulate precise review questions in a methodologically clear way [13]. The reporting of this scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) [14],

Eligibility criteria

All articles or studies relating to EPAs and nursing were considered. In addition, the following inclusion criteria were applied:

(1) Publication period from the first mention of EPAs in 1995 up until 2023 (1 January 1995 to 31 December 2023)
(2) All languages
(3) All types of literature including descriptive studies, interventional studies, reviews and opinions if they clearly described EPAs
(4) All academic nursing education fields including undergraduate, postgraduate, nursing education and bachelor of science in nursing. Clinically based programmes if they present any EPAs used to train nursing students
(5) EPAs must be mentioned in the title or abstract

Information sources

Search strategies for the various databases were developed based on keywords relating to nursing education and EPAs, which were linked by Boolean operators. The search strategies were designed to cover the PCC framework with all acronyms and synonyms. After this, the following electronic databases were searched: MEDLINE and EMBASE via OVID, CINAHL and ERIC via EBSCO host [12]. The most recent search was executed on 22nd of March 2024.

Search

All search strings used are listed in Table 1.

Table 1: Search strings for electronic databases (1 January 1995 to 31 December 2023)

Databases	Searches
Medline and Embase combined search via OVID	((entrustable professional activit* or epa or epas) and (nursing education or nursing student* or nurs*)).ti, ab.
ERIC und CINAHL combined search via EBSCOhost	TI ((“entrustable professional activit*” or epa or epas)) AND AB ((“nursing education” or “nursing student*” or nurs*))

Selection of sources of evidence

Screening was conducted in a two-stage process. The first author screened all databases following the electronic search strategy. Duplicates were removed using the predefined settings in OVID and EBSCOhost. After this, all results were imported into EndNote and manually screened. The first author looked at all full texts and checked their suitability. All unsuitable articles were removed. A second reviewer looked at all articles independently and also removed all unsuitable articles. The result between the two was compared. In case of disagreement, a third reviewer was consulted.

Data charting process

Relevant article characteristics were extracted according to predefined criteria which is shown in Table 2. Identified EPAs were described separately in greater detail in a second table.

Data items

Extracted data are shown in Table 2.

Table 2: Data charting variables/domains, according to the PCC Framework and best practice guidance and reporting items for the development of scoping review protocols [13]

PCC Elements	Item/domain	Description
	Year	Year of publication
	Author/s	List of all authors
	Publication type	Review, commentary, empirical study, other
	Study design	Descriptive, experimental
	Geographical location	Continent, country
Population	Setting	Type of school/institute/educational clinic
Context	Type of nursing programme	Undergraduate, postgraduate, bachelor of science in nursing or other type of academic programme/clinic
Concept	EPAs* characteristics	What are the EPAs described and how are they characterized?
	Title	Title of the EPA [4]
	Specifications	Included activities [4]
	Limitations	Excluded in the activity [4]
	Most relevant competency domains	Competency framework used to develop the EPAs [4]
	Implementation	Yes/no. If 'yes', when and how?

	Effects	Outcomes and effects
	Evidence supporting effects	Effect sizes

*EPAs, entrustable professional activities

Critical appraisal of individual sources of evidence

A critical appraisal and risk of bias assessment was not conducted.

Synthesis of results

A matrix was created in which the individual EPAs were compared with the subject areas and publications.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

Selection of sources of evidence

The search via Ovid initially resulted in 336 hits including duplicates, while EBSCOhost resulted in 26 hits including and excluding duplicates. After removing the duplicates, 224 hits remained for Ovid. Of these hits, 13 suitable articles remained (Figure 1). After completing the search, another article from 2024 was found to be suitable, which was included in addition. This resulted in a total of 14 included articles.

(Please insert Figure 1 here)

Characteristics of sources of evidence

Six articles described EPAs addressing general nursing [9, 10, 15-18]. Seven articles described EPAs addressing specialties including critical care, surgical nursing, family nursing, hospice care, emergency care nursing, nursing telehealth and adult gerontology primary care [19-25]. Most EPAs were from general nursing by far. Most studies used qualitative designs [9, 10, 15-18, 20, 22, 23, 25]. Three studies used both qualitative and quantitative designs [19, 21, 24]. A detailed description of the included articles can be seen in the supplementary material.

Critical appraisal within sources of evidence

Not applicable.

Results of individual sources of evidence

The general nursing EPAs included topics such as "Gather information and perform physical examination" [10], "Prioritize a Differential Diagnosis Following a Clinical Encounter" and "Document a Clinical Encounter in the Patient Record" [15], "Interprofessional collaboration" [9], "Recognize and manage patients requiring urgent care" [17] or "Provide health education and nursing consultation" [18]. The described special nursing EPAs included topics such as "Performs manual opening and insertion of temporary airway maintenance devices" [20], "Assessing and Managing Patients with Acute Medical Presentations" [24] and "Integrated immediate postmortem and acute bereavement care" [25].
Most EPAs were not implemented [10, 15, 17-21, 23, 25]. When EPAs were implemented, following effects of implementation were described: EPAs are helping as a systematic assessment, fostering teamwork and critical thinking as well as providing flexibility in assessments. On the other hand, unclear assessment criteria, a lack of standardization and manpower and a change of mindset needed to adapt to EPA skills was reported [9]. Details of proposed EPAs are described in the Supplement.

Synthesis of results

In total, EPAs have been developed in 16 areas of nursing education (see Table 3).

Table 3: Matrix of synthesis of results (The articles were divided into general nursing and special nursing and mapped to the 16 areas of nursing education on the left. Number 1 means that EPAs have been developed in the respective area of nursing education, number 0 that none have been developed)

	General Nursing						Special Nursing							
	Al-Moteri, et al. 2021	Anthamatten et al. 2019	Lau et al. 2020	Mihaljevic et al. 2018	Zhou et al. 2022	Yang Yang et al. 2024	Li et al. 2022	Miranda et al. 2021	Moore et al. 2020	Surjadi, Saxe 2019	van Houwe-lingen et al. 2016	Chiang et al. 2022	Lai et al.2023	Sum
Health status assessment (incl. nursing admissions)	1	1	1	1	1	1	1	1	1	1	1	1	0	12
Diagnoses (prioritize nursing diagnoses, differential diagnoses)	1	1	0	0	0	1	1	0	1	1	1	0	0	7
Care measures	1	1	1	0	1	1	1	1	1	1	0	1	0	10
Care documentation	1	1	0	0	0	0	0	0	1	1	0	0	0	4

Care plans, protocols	1	0	0	1	1	1	1	0	0	1	1	0	0	7
Emergency /intensive care measures	1	1	1	0	1	1	1	1	0	0	0	0	0	7
(Psychological) support	1	0	1	0	0	0	0	0	0	0	1	0	0	3
Patient education, guidance	0	0	1	0	0	1	0	0	0	0	1	0	0	3
Joint decision-making	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Prevention and health promotion	1	0	0	0	1	0	0	0	0	0	1	0	0	3
Participation in diagnostics and/or therapy	0	1	0	0	1	1	1	1	1	0	1	0	0	7
Evidence-based work	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Communication (incl. patient handover and presentation)	0	1	0	0	1	1	0	1	1	0	1	0		6
Interprofessional work (incl. ward rounds, discharges)	0	1	1	1	0	1	1	1	0	0	0	0	0	6
Leadership/ Management	0	0	1	0	1	1	1	1	0	1	1	1	0	8
Palliative care	0	0	1	0	0	0	0	0	0	0	0	0	1	2

Most EPAs have been developed in the areas *Health status assessment* (n =12)*, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy.* The fewest EPAs were developed in the areas *Joint decision making, Evidence-based work* and *Palliative care.* EPAs were implemented in the following areas: *Health status assessment (incl. nursing admissions), Care measures, Emergency/intensive care measures, Patient education and guidance, Prevention and health promotion, Communication (incl. patient handover and presentation), Interprofessional work (incl. ward rounds, discharges), Leadership/Management, Palliative care*.

DISCUSSION

Summary of evidence

Our scoping review results indicate that EPAs have been developed for 16 different areas of the care process. There are considerable similarities within the EPAs *Health status assessment, Care measures, Leadership/Management, Diagnoses, Care plans and protocols, Emergency care measures* and *Participation in diagnostics and/or therapy* across different studies. This indicates that there seems to be some kind of agreement about core EPAs in nursing education which is similar to the widely used nursing process consisting of the components Assessing, Diagnosing, Planning, Implementing and Evaluating [26]. Thus, the development of EPAs so far clearly follows the internationally established care process, which includes nursing care in the narrower sense and medical interventions. Both positive experiences and challenges are described during the implementation process. Nursing education appears to follow medical education, where a large number of EPAs exist today [27].

However, although EPAs seem to offer advantages compared to competency-based frameworks [28], empirical evidence supporting these assumptions is low. EPAs seem to offer a good opportunity to facilitate the process of transferring competencies into clinical practice. However, when looking closely at the extracted EPA characteristics and competency domains there seem to be overlaps between less and more complex competencies defining the EPAs. In addition, it is still unclear whether EPAs actually lead to better clinical performance outcomes compared to competency-based training. We were unable to identify robust evidence or study designs evaluating the effects of EPAs.

Overall, EPAs covering essential and fundamental aspects of the nursing process (e.g. health status assessment, care measures, care plans) are developed independently by different authors. On the other hand, there are special EPAs such as those for palliative care that seem to be unique. However, it is also shown that EPAs are not always named as such. For example, *Ramirez et al.* list "Knowledge and Task Practice Standards for the Emergency Nurse Practitioner", which are similar to EPAs [29]. The partly inconsistent naming of EPAs must surely be regarded as an impeding factor in the further dissemination and implementation of nursing EPAs.

Our review results indicate, that not all of the eight elements of a complete EPA (see introduction) described by Ten Cate et al. [4] are always fully specified in published EPAs. In most cases, the title, specifications and competency domains are given, whereas in particular the supervision level and assessment information are rarely listed. This is currently leading to an emerging discrepancy between the ideal depth of an EPA and the actual quality of developed nursing EPAs. To counteract this development, the "EQual" scoring rubric [30] has been established in medicine some time now. This provides a standardized opportunity for internal validation and for identifying EPAs that are insufficiently developed with regard to, among other aspects, the propagated EPA elements. This structured evaluation might be useful to develop and validate state-of-the-art EPAs in nursing education in the future.

Limitations

Since not all published EPAs are clearly designated as such, we may have missed other published frameworks similar to EPAs. In addition, maybe other search strings should have been used such as “nurse education”. Furthermore, no risk of bias assessment was conducted and no information about individual study limitations was extracted because scoping reviews systematically identity and map the breath of evidence available on a particular topic [31]. Evaluation of the quality of evidence requires a systematic review approach.

Conclusions

EPAs become more and more popular in nursing education. They largely cover the key steps of the nursing process but also address advanced and specialty topics.

The fact that EPAs are now increasingly being used and implemented in nursing curricula raises the question whether EPAs actually improve nursing education. In addition, the extent to which the achievement of objectives in nursing education is actually improved by EPAs should be further investigated as well.

Data availability statement

All collected data are presented in this work.

Author Contributions

JP is the guarantor for this manuscript. Conceptualisation and design of study: JP, JK and AM. Collected and reviewed data: JP, JK and AM. Wrote the manuscript: JP, AM and JK. All authors revised and approved the manuscript.

Patient consent for publication

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Words

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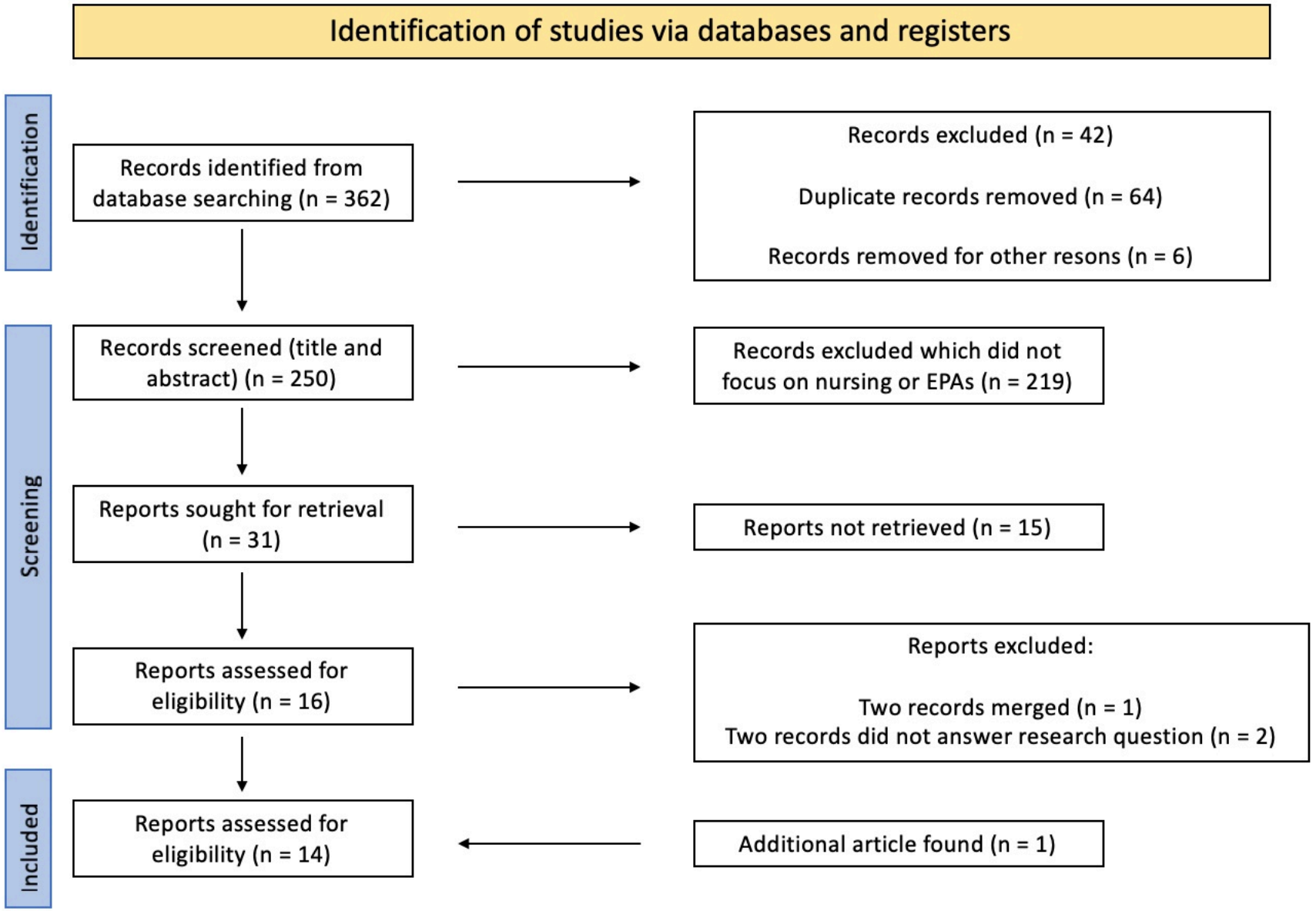
Figure legends

Figure 1: Flow diagram on the results of the screening process



SUPPLEMENT

Description of included articles:

Nr	Authors	Year	Title	Publication type	Study design	Results regarding EPAs	Geo-graphic location	Setting	Type of nursing program
1	Al-Moteri, Youssef, Elryah, et al	2021	Development of undergraduate nursing entrustable professional activities through using a participatory design approach	Empirical study	Qualitative	Development of 8 core EPAs, including descriptions and competency domains	Saudi Arabia, Asia	General nursing	BSc Nursing
2	Anthamatten, Richmond, Glassford	2019	Exploring the Utility of Entrustable Professional Activities as a Framework to Enhance Nurse Practitioner Education	Empirical study	Qualitative	Several medical EPAs and their competencies were matched to nurse practitioner competency domains	USA, North America	General nursing	MSc Nursing
3	Lau, Samarasekera, Shorey	2020	Evaluation of an undergraduate nursing entrustable professional activities framework : An exploratory qualitative research	Empirical study	Qualitative	EPAs developed and discussed based on Singapore Nursing Board (2018) competencies	Singapore, Asia	General nursing	BSc Nursing BSC Nursing Honors
		2020	Development of undergraduate nursing entrustable professional activities to enhance clinical						

			care and practice						
4	Li, Tekin, Cui, et al	2022	A novel multimodal needs assessment to inform the longitudinal education program for an international interprofessional critical care team	Empirical study	Qualitative and quantitative	Development of 20 EPA statements describing essential critical care EPAs	China, Asia	Critical care	Not described
5	Mihaljevic, Mitzkat, Probst, et al	2018	Heidelberger Interprofessionelle Ausbildungsstation (HIPSTA): a practice- and theory-guided approach to development and implementation of Germany's first interprofessional training ward	Empirical study	Qualitative	Development of curriculum including EPAs to be used as learning goals for an interprofessional training ward for nurses and physicians	Germany, Europe	General nursing	BSc (Interprofessional Healthcare)
6	Miranda, Mazzo	2021	Competences in the training of nurses to assist the airway of adult patients in urgency and emergency situations	Empirical study	Qualitative	Development and validation of EPAs and their competencies for training nurses	Brazil, South America	Surgical nursing	MSc Nursing (Medical-Surgical Nursing)
7	Moore, Hawkins-Walsh	2020	Evaluating Nurse Practitioner Student Competenc	Empirical study	Qualitative and quantitative	Successful evaluation of pilot EPAs to assess student clinical competence,	USA, North America	Family Nursing	MSc Nursing (Family Nursing

			ies: Application of Entrustable Professional Activities			according to faculty and student responses (70% found EPA descriptions useful or requiring minor editing in assessing students)			Practitioner)
9	Surjadi, Saxe	2019	Entrustable Professional Activities in Nurse Practitioner Education	Empirical study	Qualitative	Evaluation of standardized clinical evaluation tool that includes EPA-focused assessment process	USA, North America	Adult Gerontology Primary Care	MSc Nursing (Adult Gerontology Primary Care Nurse Practitioner)
10	van Houwelingen, Ettema, Kort, et al	2016	Competencies required for nursing telehealth activities: A Delphi-study	Empirical study	Qualitative	Consensus via Delphi study on 14 nurse telehealth EPAs, identified 52 competencies for telehealth	Netherlands, Europe	Nursing telehealth	Not applicable
11	Zhou, Poh, Chan et. al	2022	Development of entrustable professional activities for advanced practice nurses education.	Empirical study	Qualitative	Development and pilot testing of nine core EPAs	Singapore, Asia	General nursing	Advanced practice nurse (APN) education
12	Chiang, Yu, Chung et. al	2022	Implementing an entrustable professional activities programmatic assessment for nurse practitioner training in emergency care: A pilot study.	Observational study	Qualitative and quantitative	Development of four nested EPAs for emergency care nurse practitioners	Taiwan, Asia	Emergency care nursing	Nurse practitioner training program
13	Lai, Liu, Chen, Anna	2023	Integrated immediate postmortem and acute bereavement care:	Empirical study	Qualitative	Identification of four major EPA components and three essential competencies as highly correlated to those	Taiwan, Asia	Hospice care	Not described

			Competency-based entrustable professional activities for nursing.			components concerning immediate postmortem and acute bereavement care			
14	Yang Yang, Yue Hana, Huan Xu et. al	2024	Development of the core competency-based entrustable professional activities for Master of Nursing Specialist (MNS) graduates in China	Empirical study	Qualitative	Development and evaluation of 12 EPAs for Chinese Master of Nursing Specialists graduates	China, Asia	General nursing	Master of Nursing Specialist (MNS) graduates

Details of described EPAs:

Article 1: Al-Moteri M, Youssef HAM, Elryah AAI, Yaseen RWH, Begum F, Abdelgadir WI, et al. Development of undergraduate nursing entrustable professional activities through using a participatory design approach. J Prof Nurs. 2021;37(4):741-8.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Gather information and perform physical examination	Perform complete, focused and an ongoing patient/family/community including history taking, physical examination and interpret diagnostic test	Competency domains developed for all EPAS: 1. Evidence based practise 2. Critical thinking and problem solving 3. Communication 4. Patient centred care 5. Professionalism 6. Leadership and responsibility	No	Not described	Not described	
EPA 2: Formulate and prioritize nursing diagnoses	Analyze patient/family/community data, identify health problems, formulate and prioritize nursing diagnoses					
EPA 3: Formulate and implement care plan	Formulate goals and outcomes that directly impact the care of patient/family/community, with all different					

	types of health problems, issues and conditions, where the required interventions guided by evidence-based practice are carried-out	7. Information technology 8. Quality of care and patient safety 9. Nursing knowledge and clinical skills				
EPA 4: Perform general clinical procedures	Perform invasive and non-invasive clinical procedures that are universal among registered nurses					
EPA 5: Recognize conditions requiring emergent care	Identify signs and symptoms of patient/family/community clinical/physical/mental deterioration that need immediate attention and rapid response					
EPA 6: Apply comfort and psychological support	Identify and apply psychological support to all concerns with emotional wellbeing of the patient/family/community, including issues of self-esteem, insight into adaptation to their illness and its consequences.					
EPA 7: Promote health and prevent disease	Enable patient/family/community to increase control over and to improve their health and physical capacity					
EPA 8: Reporting patient condition and documenting care	Document and report pertinent patient information, care provided, physical/psychosocial responses of patient/family/community to nursing intervention and progress toward problem resolution					

Article 2: Anthamatten A, Pfieffer ML, Richmond A, Glassford M. Exploring the Utility of Entrustable Professional Activities as a Framework to Enhance Nurse Practitioner Education. Nurse Educ. 2020;45(2):83-7.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Gather a History and Perform a Physical Examination EPA 2: Prioritize a Differential Diagnosis Following a Clinical Encounter EPA 3: Recommend and Interpret Common Diagnostic and Screening Tests EPA 4: Enter and Discuss Orders and Prescriptions EPA 5: Document a Clinical Encounter in the Patient Record EPA 6: Provide an Oral Presentation of a Clinical Encounter EPA 7: Form Clinical Questions and Retrieve Evidence to Advance Patient Care EPA 8: Give/Receive a Patient Handover to Transition Care Responsibility EPA 9: Collaborate as a Member of an		Not described	No	Not implemented yet	Not described	

Inter-professional Team EPA 10: Recognize a Patient Requiring Urgent/Emergent Care and Initiate Evaluation and Management						

Article 3: Lau ST, Ang E, Samarasekera DD, Shorey S. Development of undergraduate nursing entrustable professional activities to enhance clinical care and practice. Nurse Educ Today. 2020;87:104347.

EPA Title	**EPAs Characteristics**	**Competency Domains**	**Implemented?**	**Effects/Results**	**Evidence Supporting Effects**	**Comments**
EPA 1: Patient Engagement	Engage patients, families, or caregivers to enhance the patient's experience	1. Communication 2. Knowledge application 3. Health assessment 4. Nursing process 5. Critical thinking/problem solving skills 6. Reflective practice 7. Documentation 8. Interpersonal skills	Yes Implemented in two phases starting December 2017 and ending in May 2018	Themes identified from focus groups: Positive effects: EPAs helping as a systematic, comprehensive assessment of holistic patient care; fostering teamwork and critical thinking; as well as providing flexibility in assessments. Negative effects: unclear assessment criteria; change of mindset needed to adapt to EPA skills; lack of standardization; lack of manpower and time constraints.	Systematic assessment: "it gives you like a structure to perform your clinical activity"	
EPA 2: Patient care and practice	Prioritize and provide patient care utilizing nursing practice standards					
EPA 3: Care management	Perform comprehensive health assessments and deliver and evaluate care for patients				Critical thinking: "…it forces us to think critically. Because like, its good in the sense like oh okay, to care for patient, there is a lot of aspect and EPA is all these things…"	
EPA 4: Common procedures	Perform procedures (e.g. verify a doctor's/nurse's order from a medical record or provide the appropriate emotional support to a patient) required of a registered nurse				Flexibility: Hosp CI: "…we use peer teaching, sometimes we break them into small groups, we have small group discussions…" (AHFGD2)	
EPA 5: Safety	Deliver care utilizing patient safety standards				Unclear criteria:	

EPA 6: Urgent care	Recognize patients requiring emergency care, initiate management, assist in resuscitation, and stabilize critically ill patients				"You know if you need CI's help half the time it is entrustment level 3, if you need me for help for 75% of the time it is a level 2. But the variable here is how the how the CI determine help needed?"	
EPA 7: Transition care	Lead health care professionals in transiting patients within and between teams				Mindset change: "OT (operating theatre) I will admit is a bit hard because some of the competency also not there. The patient lying at the table, what EPA assessment are you really going to do?"	
EPA 8: Patient education	Conduct education for patients, families, or caregivers to improve health through health promotion and disease prevention					
EPA 9: Interprofessional collaboration	Collaborate with interprofessional teams to improve the quality of healthcare				Lack of standardization: "there was a bit of discrepancy in terms of the teaching cos of the ward culture…"	
EPA 10: Palliative care	Perform assessments and deliver and evaluate care for patients requiring palliative or end-of-life care in the hospital or community				Lack of manpower/time constraints: "mainly it's the CI who assess us, but the CI don't really have a lot of time also. So, sometimes they will just ask the staff like how we did and stuff. Then, they will just base on their feedback."	

Article 4: Li H, Sun Y, Barwise A, Cui W, Dong Y, Tekin A, et al. A novel multimodal needs assessment to inform the longitudinal education program for an international interprofessional critical care team. BMC Med Educ. 2022;22(1):540.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
	EPA 1: Evaluate and manage patients presenting with acute respiratory failure, including early recognition, diagnostic evaluation, and treatment of most likely causes including pneumonia, obstructive lung disease exacerbation, congestive heart failure, pulmonary embolism and tension pneumothorax.	1. Organ support and disease management 2. Practical skills 3. Quality improvement 4. Patient-centered care and communication 5. Interprofessional skills	No	Not described	Not described	Abstract mentions development of essential critical care EPAs but no further details provided
	EPA 2: Evaluate and manage patients with sepsis and septic shock, including early recognition, resuscitation, appropriate antibiotics, and systematic evaluation for source control.					
	EPA 3: Evaluate and manage common nephrology conditions in the ICU, including acute kidney injury, renal replacement therapy, and acid base and electrolyte disorders.					
	EPA 4: Provide compassionate, patient-centered care, engaging with patients and family members in shared decision making using collaborative communication skills, empathy, and respect.					
	EPA 5: Evaluate and manage patients presenting with acute common cardiovascular conditions, including arrhythmias, acute coronary syndromes, valvular heart disease,					

	congestive heart failure, and vascular emergencies.					
	EPA 6: Evaluate and manage patients with shock, including early recognition, rapid diagnostic evaluation, and targeted treatment of cardiogenic, hypovolemic/hemorrhagic, distributive and obstructive shock, including targeted vasopressor management.					
	EPA 7: Evaluate and manage patients presenting with poisoning or overdose, including complications of alcohol, drug intoxication and withdrawal.					
	EPA 8: Evaluate and manage common gastroenterology conditions in the ICU, including acute gastrointestinal hemorrhage, difficile colitis, bowel obstruction and perforation, complications of hepatobiliary disease, and pancreatitis.					
	EPA 9: Evaluate and manage common hematology and oncology conditions in the ICU, including coagulopathy, acute/massive hemorrhage, common malignancies and their associated complications.					
	EPA 10: Evaluate and manage common neurologic conditions in the ICU, including encephalopathy,					

	seizure, stroke, and intracranial hemorrhage.					
	EPA 11: Identify, evaluate and manage patients with ARDS, collaborating with Respiratory Therapy and utilizing institutional protocols to deliver safe and effective lung protective ventilation, rapidly identify patients with refractory hypoxemia, and appropriately employ early liberation strategies.					
	EPA 12: Resuscitate and stabilize critically ill patients, performing necessary diagnostic and therapeutic interventions in a timely manner and effectively coordinating care with the interprofessional critical care team and appropriate consultants.					
	EPA 13: Safely and efficiently perform procedures common to the practice of critical care medicine, and demonstrate understanding of indications, contraindications, limitations, and complications of these interventions.					
	EPA 14: Diagnose and manage acute pain in critical illness and the perioperative setting, including appropriate use of opioids, non-opioid analgesics, and assessment scales.					
	EPA 15:					

	Evaluate and manage common critical care infections, including meningitis/encephalitis, pneumonia, catheter related bloodstream infections, simple and complicated biliary, urinary tract, skin and soft tissue infections, and opportunistic pathogens commonly seen in immune compromised hosts.					
	EPA 16: Professional, respectful and timely in the execution of all clinical activities, with appropriate communication and collaboration within interprofessional team.					
	EPA 17: Ensures effective transitions of care through consistent, concise communication of patient care plans and recommendations.					
	EPA 18: Leads efficient and effective ICU rounds by soliciting and incorporating collaborative input from the interprofessional team, appropriate consulting services, patients and families to develop a well-organized, appropriate plan of care.					
	EPA 19: Efficiently employ critical care protocols and checklists to prevent common critical care complications, and effectively diagnose and manage delirium, venous thromboembolism, nosocomial infections, malnutrition, hyperglycemia,					

	decubitus ulcers, and musculoskeletal complications.					
	EPA 20: Evaluate and manage perioperative patients and common post-surgical complications.					

Article 5: Mihaljevic AL, Schmidt J, Mitzkat A, Probst P, Kenngott T, Mink J, et al. Heidelberger Interprofessionelle Ausbildungsstation (HIPSTA): a practice- and theory-guided approach to development and implementation of Germany's first interprofessional training ward. GMS J Med Educ. 2018;35(3):Doc33.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Interprofessional surgical ward round	Conduct interprofessional ward rounds of postoperative patients on HIPSTA and jointly prepare an interprofessional plan for further diagnostic, therapeutic, nursing and rehabilitative treatment of the patient	Competency Domains derived from CanMeds/NKLM (Nationaler Kompetenzorien-tierter Lernzielkatalog). EPA 1: Medical expert, Communicator, Collaborator, Leader/manager, Professional	Yes	Not described	Not described	
EPA 2: Interprofessional patient admission	Perform an interprofessional preoperative admission of a patient to a surgical ward	EPA 2: Medical expert, Communicator, Member of a team, Leader/manager, Professional				
EPA 3: Interprofessional discharge management	To manage the discharge of a surgical patient together as an interprofessional team from the acute care setting to the subsequent health care sector (e.g. home, nursing home, rehabilitation centre) considering the individual needs of the patient as well as the intersectoral characteristics of the health care system	EPA 3: Medical expert, Communicator, Member of a team, Leader/manager, Professional				

Article 6: Miranda FBG, Alves Pereira-Junior G, Mazzo A. Competences in the training of nurses to assist the airway of adult patients in urgency and emergency situations. Rev Lat Am Enfermagem. 2021;29:e3434.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Briefly performs an anamnesis and focused physical examination of the airway	Knows the anatomy and physiology of the upper and lower airways; performs targeted anamnesis and physical examination, and associates anamnesis and physical examination with possible Nursing diagnoses.	Scientific knowledge, Technical skill (manual dexterity), Communication, Decision-making, Clinical reasoning	No	Not described	Not described	Described in the article as competence framework, these are actually descriptions
EPA 2: Performs manual opening and insertion of temporary airway maintenance devices	Identifies and describes signs and symptoms of airway impairment; recognizes needs and priorities in the development of actions relevant to forecasting devices, materials, and equipment needed to clear the airways; performs the manual airway opening techniques of head tilt-chin lift, jaw-thrust, and chin lift; performs the insertion techniques of temporary oropharyngeal cannula (Guedel) or nasopharyngeal cannula; and describes indications and contraindications for the use of these devices	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Decision-making, Clinical reasoning				
EPA 3: Recognizes the need for and the conduction of an intervention in airway aspiration	Recognizes the need and aspirates the airways with the type of material appropriate to the patient's clinical case, performs the pulse oximetry insertion techniques to check peripheral capillary oxygen saturation, identifies factors (distal perfusion, low temperature, lesions, etc.) that can make it	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Decision-making, Clinical reasoning				

	difficult to read peripheral capillary oxygen saturation in the oximeter, and applies the principles of biosafety in patient care with compromised airway					
EPA 4: Collaborates or performs the insertion of supraglottic airway devices	Collaborates or performs the insertion of supraglottic airway devices	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Team work, Decision-making, Clinical reasoning, Safety				
EPA 5: Identifies, intervenes and indicates or contraindicates the techniques of advanced maneuvers to control the airway.	Identifies, intervenes and indicates or contraindicates the techniques of advanced maneuvers to control the airway.	Scientific knowledge, Technical skill (manual dexterity), Communication, Leadership, Team work, Decision-making, Clinical reasoning, Safety				
EPA 6: Collaborates with the team to perform advanced maneuvers to control the airway	Collaborates with the team to perform advanced manoeuvres to control the airway	Scientific knowledge, Technical skill (manual dexterity), Inter-professional communication, Decision-making, Clinical reasoning, Leadership				

Article 7: Moore J, Hawkins-Walsh E. Evaluating Nurse Practitioner Student Competencies: Application of Entrustable Professional Activities. J Nurs Educ. 2020;59(12):714-20.

EPA Title	**EPAs Characteristics**	**Competency Domains**	**Implemented?**	**Effects/Results**	**Evidence Supporting Effects**	**Comments**
EPA 1a: Gather a history	Obtain a complete and accurate history in an organized fashion. Demonstrate patient-centered interview skills. Demonstrate clinical reasoning in gathering focused information relevant to a patient's care.	Not described	No	Not described	Not described	
EPA 1b: Perform a physical Examination	Perform a clinically relevant, appropriately thorough physical examination pertinent					

	to the setting and purpose of the patient visit. Demonstrate clinical reasoning in gathering focused information relevant to a patient's care.					
EPA 2: Prioritize a differential diagnosis following a clinical encounter	Synthesize essential information from previous records, history, physical examinations, and initial diagnostic evaluations to propose a scientifically supported differential diagnosis. Prioritize and continue to integrate information as it emerges to update differential diagnosis, while managing ambiguity. Engage and communicate with team members for endorsement and verification of the working diagnosis that will inform management plans.					
EPA 3: Recommend and interpret common diagnostic and screening tests	Recommend first-line, cost-effective screening and diagnostic tests for routine health maintenance and common disorders. Provide rationale for decision to order tests, taking into account pre- and post-test probability and patient preference. Interpret results of basic studies and understand the implication and urgency of the results.					
EPA 4: Enter and discuss orders and prescriptions	Compose orders efficiently and effectively on paper, verbally, and electronically. Demonstrate an understanding of the patient's condition that underpins the provided orders. Recognize and avoid errors by attending to patient-					

	specific factors using resources, and appropriately responding to safety alerts. Discuss planned orders and prescriptions with team, patients, and families.					
EPA 5: Document a clinical encounter in the patient record	Prioritize and synthesize information into a cogent narrative. Follow documentation requirements to meet regulations and professional expectations. Document a problem list, differential diagnosis, and plan supported through clinical reasoning that reflects the patient's preferences.					
EPA 6: Provide an oral presentation of a clinical encounter	Present personally gathered and verified information, acknowledging areas of uncertainty. Provide an accurate, concise, well-organized oral presentation. Adjust the oral presentation to meet the needs of the receiver. Demonstrate respect for patient's privacy and autonomy.					

Article 9: Surjadi M, Stringari-Murray S, Saxe JM. Entrustable Professional Activities in Nurse Practitioner Education. The Journal for Nurse Practitioners. 2019;15(5):e97-e102.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA: Independence in Clinical Practice		1. Information gathering/interviewing skills 2. Physical examination Logical sequence and appropriate physical examination maneuvers 3. Clinical judgment/assessment 4. Management plan 5. Professionalism 6. Overall clinical competence	Yes	"Student Performance Evaluations (2016-2018) examples: Complete symptom description increased from a mean of 4.08 to 4.69 Accurate collection of patient's history increased from a mean of 4.28 to 4.79 Evidenced based therapeutic interventions increased from a mean of 3.86 to 4.76 Care coordination and patient, family, and caregiver advocacy increased from a mean of 3.17 to 4.87 Demonstrates cost and efficiency considerations in patient care increased from a mean of 2.6 to 4.83"	Milestones and competencies were evaluated based on a revised EPA evaluation tool, which showed favorable results in ease of completion of the tool for faculty, preceptors, and students	This article focuses on the development and evaluation of an EPA assessment tool for measuring leaner performance

Article 10: van Houwelingen CT, Moerman AH, Ettema RG, Kort HS, Ten Cate O. Competencies required for nursing telehealth activities: A Delphi-study. Nurse Educ Today. 2016;39:50-62.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Support patients	Supporting patients in the use of technology	Coaching skills, the ability to combine clinical experience with telehealth, communication skills, clinical knowledge, ethical awareness, and a supportive attitude	No	Not yet implemented	Not described	Contains comprehensive list of Skills, Knowledge, and Attitudes for each Nursing Telehealth EPA
EPA 2: Train patients	Training patients in the use of technology as a way to strengthen their social network preoperative admission of a patient to a surgical ward					
EPA 3: Health promotion	Providing health promotion remotely					
EPA 4: Triaging	Triaging incoming calls and alarms					
EPA 5: Data analysis	Analyzing and interpreting incoming data derived from (automatic) devices for self-measurement					
EPA 6: Monitoring	Monitoring body functions and lifestyle					
EPA 7: Psychosocial support	Providing psychosocial support					
EPA 8: Encouraging	Encouraging patients to undertake health promotion activities					
EPA 9: Instructing	Instructing patients and family care givers in self-care					
EPA 10: Assessing	Assessing patient capacity to use telehealth					
EPA 11: Evaluating	Evaluating and adjusting the patient care plan					
EPA 12: Coordinating	Coordination of care with the use of telehealth technology					
EPA 13: Double-check	Independent double-check of high-risk medication					
EPA 14: Peer consultation	Guidance and peer consultation					

Article 11: Zhou W, Poh CL, Chan HL, Shorey S. Development of entrustable professional activities for advanced practice nurses education. Nurse Educ Today. 2022;116:105462.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Perform an initial assessment and formulate management plans		Sub-competencies of clinical practices: P1 respect the values, customs, spiritual beliefs and practices of individuals and groups P2 Demonstrate responsibility and accountability within the scope of practice and level of competence P3 Apply key principles of SNB's code for Nurses and Midwives for ethical decision making P4 Practise in accordance with institutional/national legislation, policies and procedural guidelines P5 Ensure own physical, cognitive, psychological & emotional fitness to practice and deliver safe care P6 Aware of one's own knowledge, skill, beliefs, value and emotional limitations that leads to appropriate help-seeking behaviours P7 Recognize clinical ambiguity and utilize appropriate resources in dealing with uncertainty	No	Not yet implemented	Despite the stakeholders having generally positive attitudes towards the use of EPAs, it has its drawbacks. Additionally, the described set of core APN EPAs needs more refinement and rigorous testing before it can be implemented on a larger scale	
EPA 2: Manage follow-up care for a clinical encounter						
EPA 3: Plan, perform and evaluate care procedures						
EPA 4: Recognise and manage patients requiring urgent care						
EPA 5: Manage care transitions within and between health care organisations						
EPA 6: Recognise and manage pharmacological needs of patients						
EPA 7: Collaborate with patients, families, and community to improve health through disease prevention and health promotion						
EPA 8: Participate in health quality improvement initiative						
EPA 9: Develop self and others for						

professional practice.						

Article 12: Chiang YH, Yu HC, Chung HC, Chen JW. Implementing an entrustable professional activities programmatic assessments for nurse practitioner training in emergency care: A pilot study. Nurse Educ Today. 2022;115:105409.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA 1: Assessing and Managing Patients with Acute Medical Presentations	Collecting medical history Performing basic physical examinations Arranging and interpreting diagnostic tests Establishing medical orders under the instruction of attended physician Completing medical record Communicating health care plan and obtaining informed consent Identify critically ill patient Counseling and health education	1. Patient care 2. Medical knowledge 3. System-based practice 4. Professionalism 5. Practice-based learning/improvement 6. Interpersonal communicating skills 7. Personal and professional development	Yes	- Novice nurse practitioners (n = 8) were assessed once per week by nurse practitioner leader and two physicians - Increase of average supervision entrustment score in EPA1 (p = 0.011) - No differences in EPA 2, 3, 4 - Longest time required for novice nurse practitioners to achieve a stable level 5 entrustability score for at least 3 consecutive months for EPAs 1, 2, 3, and 4 was 18, 11, 11, and 8 months	Not described	
EPA 2: Performing Basic Procedures	Obtaining informed consent Evaluation before execution Operating skills Evaluation and confirmation after the procedures Providing health education					
EPA 3: Communicating Consultations/Referrals	Monitoring the progress of the patient's condition Seeking consultation/referral resources Communicating with members of					

	consulting/referral subspecialties Facilitating appropriate patient care using consultation/referral information					
EPA 4: Providing and Receiving the Handover in the Transition of Care	Integrating shift information Performing oral handover Receiving messages and asking questions Ensuring complete referral patient's information					

Article 13: Lai WS, Liu LC, Chen HM, Anna A. Integrated immediate postmortem and acute bereavement care: Competency-based entrustable professional activities for nursing. Nurse Educ Today. 2023;126:105812.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments
EPA: Integrated immediate postmortem and acute bereavement care	Assist with postmortem care and provide appropriate care and support to bereaved family members experiencing acute grief Four essential EPA components: 1. Cultural and religious ritual assessment 2. Death preparation 3. Postmortem care 4. Acute bereavement care	General clinical skills; Communication and teamwork capabilities; Caring	No	Not yet implemented	Not described	Contains comprehensive list of Skills, Knowledge, Attitudes and experiences

Article 14: Yang Y, Han Y, Xu H, Wang T, Li Z, Huang K, et al. Development of the core competency-based entrustable professional activities for Master of Nursing Specialist (MNS) graduates in China. Med Teach. 2024:1-9.

EPA Title	EPAs Characteristics	Competency Domains	Implemented?	Effects/Results	Evidence Supporting Effects	Comments

EPA 1: Perform health assessments		1. Knowledge acquisition 2. Clinical practice 3. Communication 4. Scientific thinking and clinical research 5. Clinical management and coordination 6. Other competencies	No	Not yet implemented	Not described	
EPA 2: Identify and prioritize nursing diagnoses						
EPA 3: Formulate and implement care plan						
EPA 4: Perform basic and specialized care operations						
EPA 5: Recognize and manage medication needs of patients						
EPA 6: Assess and manage patients with mental health problems						
EPA 7: Recognize and assist in rescuing critically ill patients						
EPA 8: Perform transition and handover						
EPA 9: Participate in multidisciplinary team collaborative care						
EPA 10: Provide health education and nursing consultation						
EPA 11: Formulate and implement discharge plans						
EPA 12:						

Instruct nursing students in a clinical setting						