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Elements of entrustable professional activities for dental educators: a scoping review

Noraini Abu Bakar[1,2*], Nurhanis Syazni Roslan[3*], Muhammad Ain Ul Haq[4] and Muhammad Saiful Bahri Yusoff[5]

Abstract

Background Assessing the competencies of health professions educators remains a significant challenge, prompting the consideration of Entrustable Professional Activities (EPAs) as a potential solution. EPAs represent responsibilities that individuals can be entrusted to perform once they have demonstrated sufficient competence and reliability. Originating from the complexities of competency-based medical education, the concept of EPAs is still relatively new in the field of dentistry. To date, most published EPAs focus primarily on dental students, with limited attention given to their application for dental educators. Therefore, the rationale for this review was to systematically explore the existing literature on EPAs for dental educators, providing a foundation for the future development of structured and effective EPA frameworks tailored to dental education.

Methods Addressing the research question- What are the elements of EPAs for dental educators, as described in the literature? - the review adhered to the Joanna Briggs Institute scoping review framework and the Preferred Reporting Items for Systematic reviews and Meta-Analyses for Scoping Reviews methodology (PRISMA-ScR). Employing a rigorous three-step search strategy across five electronic databases (PubMed, Google Scholar, Scopus, Cochrane Library and ProQuest), the review includes articles published between January 1, 2005 and October 1, 2024 with eligibility criteria targeted papers published in English with keywords/Search term ("Entrusted Professional Activities" OR "Entrustable Professional Activities" OR"Entrustable profession* activit*") AND ("Dental Educator*" OR "Dental Education" OR Dentistry). The results were summarized, coded and thematically categorized and mapped to existing competency for dental educators.

Results The review scoped five articles that described a total of forty-three (43) EPAs. Seven (7) of these EPAs were found to overlap; therefore, they were consolidated to four (4) EPA statements following a consensus, resulting in a total of 40 final EPA statements. The review yielded seven (7) themes: Teaching; with five EPAs, Bedside Teaching; with seven EPAs, Surgical Teaching skills; with 7 EPAs, Mentoring and coaching; with two EPAs, Research and scholarships; with eight EPAs, Educational development; with seven EPAs and Assessment; with four EPAs.

Conclusions This review established a foundation for a larger study designed to develop a framework of EPAs tailored specifically for dental educators.

Protocol registration The protocol have been published in JMIR Research Protocolshttps://doi.org/10.2196/74225.

*Correspondence:
Noraini Abu Bakar
nor_aini@iium.edu.my
Nurhanis Syazni Roslan
nurhanis_syazni@usm.my

Full list of author information is available at the end of the article

Keywords Entrustable professional activities, Dental educators, Elements

Background

In Health Professions Education (HPE), the competency of educators has often been overlooked, with primary emphasis placed on assessing student performance [1]. However, in recent years, increasing attention has been given to the importance of ensuring that educators themselves are competent [2–4]. Medical educationists have begun to question the assumption that faculty are adequately prepared to fulfil their teaching responsibilities, particularly in ensuring the delivery of safe, high-quality healthcare. This concern is especially significant given the central role educators play in shaping future healthcare professionals and maintaining patient trust in the system [1, 5].

Assessing the competencies of health professions educators poses considerable challenges, prompting the proposal of EPAs as a viable solution [1, 6]. Introduced by ten Cate in 2005 [7], EPAs offer a structured approach to competency-based assessment in medical education. They represent key tasks or responsibilities that an individual can be entrusted to perform once they have demonstrated sufficient competence. EPAs emerged in response to the complexities of competency-based education, serving as a practical bridge between abstract competencies and real-world professional duties [5]. In the context of health professions education, EPAs ensure that educators are entrusted with critical instructional and administrative responsibilities based on observable and assessable performance [8].

When considering Dental Educators within the broader framework of Health Professions Educators (HPEs), their EPAs align closely with general competencies required in health professions education. However, dental educators do have unique clinical, technical, and procedural teaching responsibilities that distinguish them from other health educators (e.g., medicine, nursing, allied health).

There is growing recognition that for the dental profession to effectively fulfil its responsibility of training competent practitioners, equal emphasis must be placed on the competencies of dental educators. In 1999, the American Association of Dental Schools highlighted that the quality of dental students is critically dependent on having a sufficient number of educators who possess both subject-matter expertise and sound pedagogical skills. A decade later, in 2009, Lucinda J. Lyon introduced a baseline model of dental teaching expertise, drawing on the Dreyfus and Dreyfus five-stage model of skill acquisition [9]. This was followed in 2010 by the UK Committee of Postgraduate Dental Deans and Directors (COPDEND), which developed a comprehensive set of guidelines for postgraduate dental educators, consisting of 79 statements organized into eight key domains [10]. This initiative was subsequently followed by the establishment of standards for dental educators in 2013, with five key domains [4].

The most extensive and inclusive framework to date was proposed by Chuenjitwongsa et al. (2018), outlining 12 competency domains for dental educators, each comprising detailed subdomains. This framework offers a comprehensive and holistic view of the skills and attributes essential for effective dental teaching [11]. In the same year, a curriculum for European dental educators was also developed using the Delphi technique. This curriculum identified four core domains: educational principles, educational practice in dentistry, curriculum development and evaluation, quality assurance and improvement, and educational professionalism [12].

There is however, a notable deficiency in published evidence regarding EPAs specifically for dental educators. Most existing literature on EPAs primarily focuses on student assessments, particularly within the context of postgraduate dental training [13, 14]. There was a scoping review conducted in 2023 examined EPAs within the broader framework of dental education; where it predominantly concentrated on the general aspects of EPAs in dentistry, without addressing the dental educators [15].

This indicates a significant gap in the need for a framework of EPAs for dental educators to guide and assess the competencies of those who teach in dental settings. To address this, baseline literature data must be systematically searched, highlighting the necessity of this scoping review.

Methods

Study design

The study followed the methodological framework outline by Arksey and O'Malley [16] and guidelines by the Joanna Briggs Institute (JBI) [17]for scoping reviews, as well as the published PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) standards [18] PRISMA-ScR Checklist is in Appendix 1. The protocol have been published in JMIR Research Protocols https://doi.org/10.2196/74225 [19].

Review team

The review team consisted of two qualified medical education experts, each holding a doctorate in medical education, possessing over five-years of experience in medical education teaching and conducting scoping reviews (MSBY and NSR). Furthermore, the team includes two experienced dental educators, one is the

Table 1 Framework of the scoping review

Population	Concept	Context
Dental educators	Entrusted/Entrustable Professional Activities (EPA)	Elements of EPA

lead of dental education pathway in a renowned medical education centre (MAH) whilst another dental educator currently pursuing a PhD in medical education (NAB). A qualified senior librarian was also engaged from earlier on to ensure the correct search with implementation of Boolean search processes and the extraction of relevant literature.

Objective and research question

This scoping review aimed to examine the breadth and extent of evidence regarding EPAs for dental educators. The review addressed the following primary question: [1] What are the elements of EPAs for dental educators, as described in the literature?

Information sources and search framework

Framework

The framework for this scoping review is as illustrated in Table 1.

Concept

This scoping review incorporated resources to capture the evidence, scope, and range of EPAs for dental educators. Dental educators refer to individuals engaged in teaching at all levels of dental education, including both undergraduate and postgraduate programs, irrespective of their geographical background.

Context

The context of this review encompasses the elements, characteristics, domains, and related themes that define or describe the EPAs for dental educators.

Search strategy

This review was conducted utilizing a three-phase search strategy aligned with the recommendations of the JBI Scoping Review Guidelines. Initially, keywords were identified and selected from the titles and index terms of pertinent reviews. These keywords were derived from the Medical Subject Headings (MeSH) and Education Resources Information Center (ERIC) databases and were subsequently tested with various search terms using Boolean combinations. The search terms were refined and adapted following multiple test searches.

Search terms The following search term were used: ("Entrusted Professional Activities" OR "Entrustable Professional Activities" OR "Entrustable profession* activit*") AND ("Dental Educator*" OR "Dental Education" OR Dentistry).

Time frame Since 2005 marked the introduction of EPA by Olle Ten Cate, the review encompassed articles published between January 1, 2005, and October 1, 2024. The review was conducted from 15th October 2024 till 23rd Feb 2025.

Type of articles and data bases The scoping review examined published primary and secondary research that described the Entrusted/Entrustable Professional Activities (EPAs) for dental educators globally in five databases: PubMed, Google Scholar, Scopus, Cochrane Library and ProQuest (Table 2).

Inclusion and exclusion criteria

The inclusion and exclusion criteria is as illustrated in Table 3.

Table 2 Table of the key concepts, free text terms and controlled vocabulary terms

	Concept 1	Concept 2
Key concepts	Entrusted Professional Activities	dental educators//dental education/dentistry
Free text terms/natural language terms *Author keywords (from papers)*	• Entrustable professional activities • Entrusted professional activity • Entrustable professional activity	• Dental educator • Dental educators • Dental education • Dentistry
Controlled vocabulary terms/Subject Terms	Not Applicable	Indexterms/mesh/emtree MeSH (Education, Dental) (Dentistry)

Table 3 Inclusion and exclusion criteria utilized during the screening of the population, concept, and context examined in the scoping review

	Inclusion Criteria	Exclusion Criteria
Population	• Dental educators or Dental Lecturers • Including either undergraduate and/or postgraduate level of educators • Including both private and public education institutions	• Non health/non-medical/non-dental related educators
Concept	Entrusted Professional Activities/Entrustable Professional Activities	-
Context	• Element/Standard/domain/item/skills/characteristics of dental educators	-
Other	• Published in the English Language • Study design: All study type • Study location: From all geographical locations • Published between 2005 to 2024 • Full Text	• Published in a language other than English • Non full text

Data charting process

Qualitative data were aggregated using Microsoft Excel 2019. Differences were identified and resolved through discussions among the raters. Given the heterogeneous nature and limited number of articles, the quality of the studies was not assessed.

Collating, summarising and presentation of results

The extracted data were presented in tabular form and describe using descriptive statistics. A thematic approach employed, utilizing NVivo 15 software for qualitative analysis. The data were thematically organized according to the elements of the EPAs for dental educators and other related factors. Final themes were reviewed against the coded extracts to ensure coherence and relevance. The elements of the EPA for dental educators then mapped to their associated theme identified during the review. The EPA was also additionally mapped to the appropriate competency. The mapping was conducted through a consensus among three raters.

Ensuring reliability and validity

Due to the heterogeneous nature of the articles and their small number, the quality of the studies was not assessed. The reliability and validity of this scoping review were ensured through both theoretical and procedural strategies. The review was guided by Arksey and O'Malley's methodological framework and reported according to the PRISMA-ScR checklist, which enhanced transparency and rigor. Procedurally, a systematic and reproducible search strategy was employed across multiple databases. A detailed audit trail was maintained to ensure transparency at each review stage. These methodological safeguards contributed to the trustworthiness and robustness of the scoping review.

Ensuring analytic rigor and addressing logical leaps

Although thematic interpretation is not the core objective of a scoping review, the research team took deliberate steps to ensure analytic rigor and avoid logical leaps in categorization process. An inductive approach was used to allow categories to emerge from the data, and the research team engaged in reflexive, iterative discussions throughout the data charting and synthesis phases. Each stage of categorization was reviewed collaboratively to verify that groupings reflected the content and intent of the included studies.

Results

The initial search utilized selected search terms across chosen databases, resulting in 1,632 articles ($n = 1632$). Information, including titles and synopses of all articles, was organized and recorded in an Excel 2019 spreadsheet according to the respective databases.

A total of 1,487 articles were excluded based on their titles and synopses ($n = 1487$), and duplicates were removed ($n = 48$) by two raters. The remaining articles' titles and abstracts ($n = 97$) were screened by all four raters to assess eligibility for inclusion. Any discrepancies were discussed and decisions were made through consensus. A total of 61 ($n = 61$) irrelevant articles were excluded for reasons such as focusing on EPAs for clinical specialties, assessing educators' readiness rather than EPAs, or addressing EPAs for newly graduated dental students. This resulted in 36 articles being eligible for full assessment. Of these, 31 articles were excluded: 18 were not related to EPA for dental educators, 1 was not in English, 1 could not be retrieved, and 11 pertained to EPA for dental students. Five articles ($n = 5$) were included in this review [1, 20–23]. The results are illustrated in the PRISMA flow chart in Fig. 1. Full data is in Appendix 2.

General overview of the included articles

All five articles were published between 2017 and 2024. None of the five studies focused exclusively on dental educators as participants; instead, most studies, three in total, included dental educators as part of the broader context of Health Professions Educators [20–22]. One opinion paper featured four medical education experts discussing EPA in HPE in general which is applicable to Dentistry [1]. Additionally, another study involved a panel of experts from the Society of Directors of Research in Medical Education (SDRME-North America) and specialists in health professions education from other regions [23]. Notably, three studies—representing 60% of the total—were international, as they either conducted research in multiple countries or included international participants [1, 20, 23]. 40% of the studies were based in Pakistan, while the Netherlands, Iran and the United States each accounted for 20%. The general characteristics of the five selected articles is presented in (Table 4) while their overview is provided in (Table 5).

EPA statement and emerging theme – unit of work

The review scoped a total of forty-three (43) EPAs from the five articles. During the analysis, seven EPAs were found to overlap in content. To minimize redundancy, they were reviewed and consolidated into four statements through consensus among the reviewers. This refinement resulted in a final total of 40 EPA statements, as detailed in Table 6. Seven (7) overarching themes emerged, under which the EPAs were systematically categorized. The list of EPAs was then mapped to the competency domains proposed by Chuenjitwongsa et al. (2018), based on consensus among three reviewers. The 40 EPAs, categorized under seven themes and its alignment with the twelve competency domains for dental educators, are presented in Table 7.

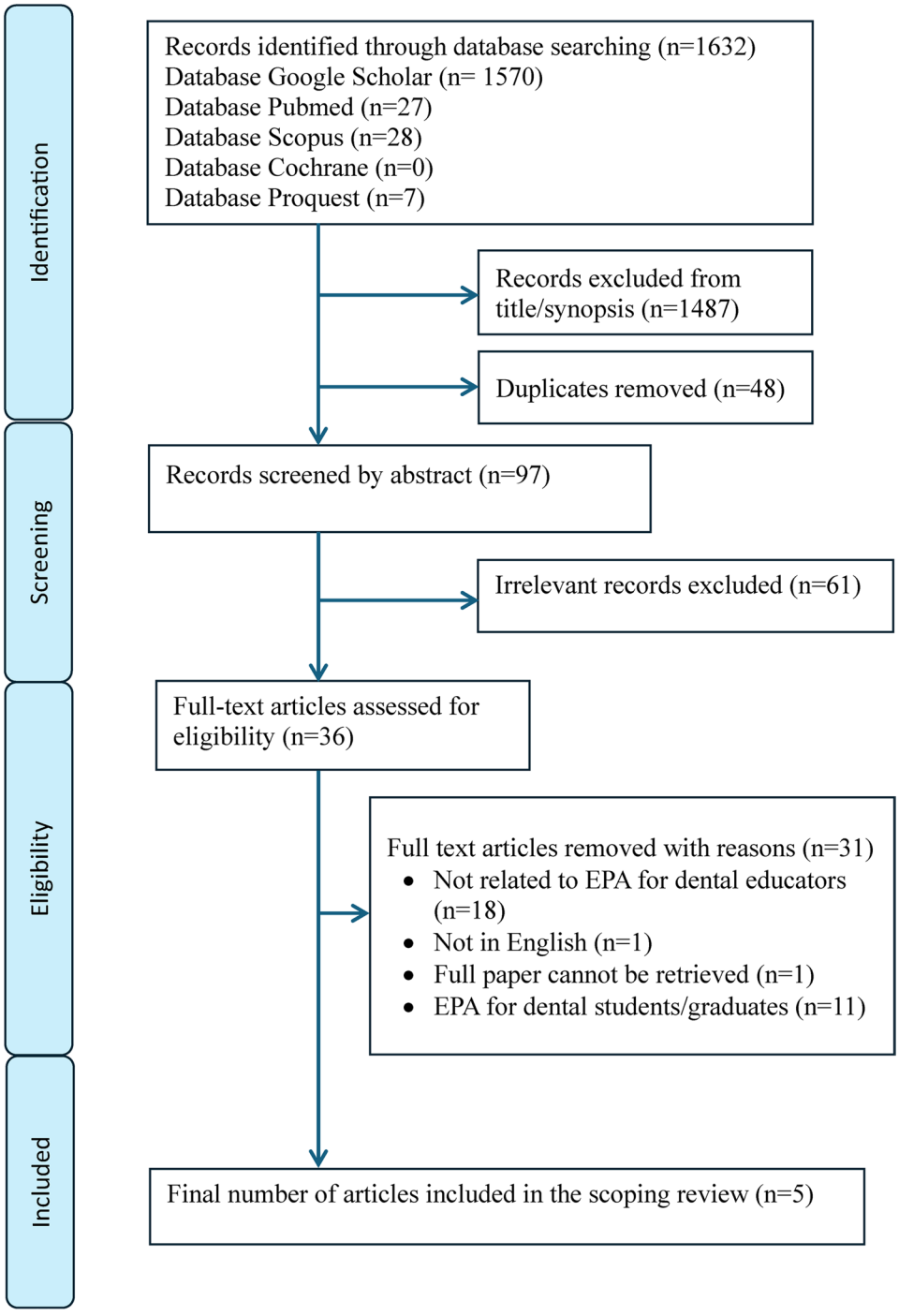

Fig. 1 A PRISMA – ScR flow diagram

The final forty (40) EPAs is presented in Table 6.

Discussion

EPAs element identified

The forty identified EPAs and their associated themes are highly relevant and show strong alignment with the established competency domains in health professions education. Their broad applicability underscores the foundational skills and professional attributes that are essential across the disciplines. However, while these EPAs offer a solid starting point, certain adjustments or contextual adaptations may be required to better reflect the specific nature of dental practice. For instance, replacing the term *"bedside"* with *"chairside"* would be more appropriate in dental settings, ensuring that the terminology and context resonate with dental educators. Such

Table 4 General characteristics of the reviewed articles included

References	Country	Type of articles	Participants Nature	Participants Number	International Involvement	No of EPAs extracted	EPA Development process
L.Van Bruggen et al. 2021 [20]	[a]Netherlands	Mixed Method	Health profession educators (Medicine, Surgery and Dentistry)	64	Yes	9	Literature Review + two-round of Delphi Technique + International Group consultation + Focus Group Discussion (FGD)
Rafiq et al. 2024 [21]	Pakistan	Mixed Method	Clinical teachers, medical educationists and postgraduate residents (Medicine, Surgery, Dentistry)	182	No	5	Nominal Group Technique (NGT) + Jigsaw puzzle technique (JPT) + Literature Review + EQual Rubric + Modified Delphi technique
Dewey et al. 2017 [1]	[a]USA	Opinion paper	Medical educationists	4	Yes	5	Opinion paper
Khaleeq et al. 2023 [22]	Pakistan	Mixed Method	Medical and Dental clinical teachers teaching undergraduate and postgraduate	50	No	7	Literature Review + Modified Delphi Technique (Two-rounds of consensus survey)
Gandomkar et al. 2022 [23]	[a]Iran	Mixed Method	Experts from Society of Directors of Research in Medical Education (SDRME-North Americans) and experts in HPE in other geographical area	15	Yes	17	Modified Delphi Technique (Three-rounds of consensus survey)
				Total: 315		Total :43	

[a]Please note that these articles are multinational articles where research has been conducted in multiple countries or with involvement of international

refinements would enhance the clarity, relevance, and applicability of EPAs in the dental curriculum. Nevertheless, this current framework provides a valuable baseline upon which future developments can be built, paving the way for a more profession-specific and practice-oriented approach to EPA implementation for dental educators.

EPA development process

Developing EPA requires a structured approach to ensure they are grounded in real-world practice and aligned with established competencies. Below are the various methods utilized in the five reviewed articles:

Literature review

80% of article started of the process with some form of literature review which is advocated in developing EPA. Literature review helps identify existing knowledge and gaps hence ensures the EPA is set in current scientific understanding [6].

Modified delphi technique

The most widely used approach for building consensus were the Delphi method and stakeholder deliberation, identified in 80% of the articles reviewed [20–23]. This technique is both efficient and effective for achieving consensus through an iterative process characterized by systematic progression through repeated voting rounds. It is particularly advantageous for ascertaining expert group consensus in scenarios where definitive evidence is absent and opinions are critical. The modified Delphi method was preferred because it facilitates expert interaction in the final round, enabling panel members to clarify their positions and present arguments to substantiate their viewpoints. Research indicates that the modified Delphi method can exceed the original Delphi method's effectiveness and is frequently recognized as highly cooperative and impactful [24].

EQual rubric

Only one article utilized the EQual rubric, accounting for 20% of the total [21]. EQual rubric is a validated tool designed to assess the quality of EPA [25]. It ensures that the EPA aligns with the literature-described standards within three major domains: discrete units of work, entrustability and curricular role. It is commendable to use EQual rubric to ensure systematic evaluation of the quality of the EPA.

Jigsaw Puzzle Technique

Rafiq et al. (2024) utilize the Jigsaw Puzzle Technique [21], an active learning method that enhances understanding through peer teaching. Learners first split into "Home" groups to divide a topic, then join "Expert" groups to master their assigned subtopics [26, 27].

Table 5 Overview of the five included articles with the EPAs extracted from each article

Article	Overview	EPA extracted	
L.Van Bruggen et al. 2021[20]	**Title: Developing entrustable professional activities for university teachers in the health professions** Based in Netherlands, the article explores the concept of EPA and their application to university teachers in health professions education including dental educators. The study used a systematic, expert-driven approach to create EPAs tailored for university teachers in health professions. A two-round Delphi study at a Dutch academic medical center reached local consensus on nine EPAs. An international survey and focus group confirmed the relevance and usefulness of most EPAs but highlighted concerns about clarity and the need for local adaptation.	1 2 3 4 5 6 7 8 9	Lecturing Teaching small groups[a] Teaching lab classes and skills education Bedside teaching [b] Mentoring and tutoring [c] Supervising (clinical) internships Assessing written work of students Designing and developing a course and developing Administering a test including establishing test results
Rafiq et al. 2024[21]	**Title: Entrustable professional activities for bedside clinical teachers** This study aimed to develop and validate Entrustable Professional Activities (EPAs) to meet the need for structured training and assessment of bedside clinical educators. Conducted in Pakistan, this study employed a multi-method approach involving clinical teachers (including dental educators), medical education specialists, and postgraduate students. Although not all dental educators are involved in bedside teaching, the concept remains highly relevant, particularly in hospital-based dentistry. Moreover, its principles can be effectively translated into chairside teaching, where real-time patient interaction serves as a critical learning experience in non-hospital dental settings. This study included a nominal group discussion, literature mapping, expert evaluation with the EQual rubric, and a two-round modified Delphi process. Thematic and statistical analyses were conducted. The study identified five key EPAs: developing a bedside teaching program, planning and conducting sessions, conducting assessments, and evaluating bedside teaching.	1 2 3 4 5	Developing bedside teaching program Planning bedside teaching Conducting bedside beaching [b] Conducting bedside teaching assessment Evaluating bedside teaching
Dewey et al.2017[1]	**Title: Entrustable professional activities (EPAs) for teachers in medical education: Has the time come?** This opinion article was authored by a team of four, led by a primary author based in the United States, in collaboration with two co-authors from the Netherlands and another co-author, also based in the United States. They emphasised the importance of having competent educators in ensuring safe and high-quality healthcare. Although it was an opinion article, early clinical teacher EPAs such as Assessment of Trainee Proficiency, Coaching and Mentoring, Individual or Small Group Teaching, Large Group Teaching, and Learner-Centered Bedside Teaching were suggested in this article.	1 2 3 4 5	Assessment of trainee proficiency Coaching and mentoring [c] Individual/small group teaching [a] Large group teaching Learner-centered bedside teaching
Khaleeq et al. 2023[22]	**Title: EPAs for clinical surgical teaching skills for undergraduate medical and dental clinical teachers** Based in Pakistan, this study aimed to develop EPA specific for clinical surgical teaching involving both medical and dental surgical teachers. Utilizing two rounds of Modified Delphi Technique, this study developed 7 EPAs with 46 competencies for surgical teaching skills of surgical teachers.	1 2 3 4 5 6 7	Role modelling Feedback Surgical scrub Gowning and gloving Infection control Basic suturing skills Wound management

Table 5 (continued)

Article	Overview	EPA extracted	
Gandomkar et al. 2022[23]	**Title: Expectations for PhDs in health professions education: An international EPA-framed, modified Delphi study** This study was aimed to established EPA for PhD holders in Health Professions Education (HPE) including dental educators. Although not all dental educators possess a PhD in Health Professions Education, this study was included as it met the inclusion criteria and was deemed relevant in contributing foundational insights towards EPA for dental educators. Building on a previous national framework from Iran, the study engaged 15 international experts over three rounds of Modified Delphi Technique and finalized a set of 17 EPAs.	1	Writing educational research proposal
		2	Conducting qualitative educational research
		3	Conducting quantitative educational research
		4	Conducting mixed methods and consensus studies
		5	Writing and publishing empirical research reports
		6	Conducting and publishing literature reviews
		7	Presenting at conferences and other meetings
		8	Peer reviewing and editing
		9	Conducting educational needs assessments
		10	Developing a curriculum blueprint
		11	Instructional design for a variety of teaching and learning contexts
		12	Teaching and facilitating learning
		13	Designing, applying and revising student assessment systems
		14	Designing, applying and revising educational quality assurance
		15	Designing and implementing faculty development
		16	Mentoring, coaching and advising individual students and faculty [c]
		17	Leading strategic education projects and policy developments

Total of 43 EPAs extracted. 7 were overlapped and consolidated to 4 EPAs statement as detailed below

[a]These two EPAs "Teaching small groups" and "Individual or small group teaching" merged as EPA No 2: "Individual or small group teaching"

[b]These two overlapping EPAs "Conducting bedside teaching" and "Bedside teaching" have been consolidated into EPA No 6: "Conducting bedside teaching"

[c]The three EPAs "Mentoring and Tutoring," "Coaching and Mentoring," and "Mentoring, Coaching, and Advising Individual Students and Faculty" overlapped. These were consolidated into two EPAs: No. 20, "Mentoring, Tutoring, and Coaching Students," and No. 21, "Mentoring, Coaching, and Advising Faculty."

Nominal Group Technique

Rafiq et al. (2024) stands out as the sole study to integrate the Nominal Group Technique with the Jigsaw Puzzle Technique. This methodological combination has proven particularly effective in facilitating consensus among groups, notably among clinical experts. It has been validated that Nominal Group Technique is a productive and efficient approach to data collection, yielding information structured according to a hierarchy of perceived importance and identifying pertinent real-world challenges.

The assessment of EPA-related competence measures

Mapping Entrustable Professional Activities (EPAs) to competencies is crucial for ensuring that tasks and responsibilities align with the overarching goals of a competency-based education system. However, resources outlining competencies specifically for dental educators are limited. In 2009, Lucinda J. Lyon proposed a foundational model for quality dental expertise, which, while significant, does not constitute a competency framework itself. In 2010, the UK Committee of Postgraduate Dental Deans and Directors (COPDEND) established guidelines for postgraduate dental educators; these guidelines are not formally recognized as competencies [10]. The most comprehensive framework specifically addressing the competencies of dental educators to date was developed by Chuenjitwongsa et al. (2018), detailing 12 competency domains along with extensive subdomains. This framework, although developed through literature search, represent the most thorough resource currently available for defining competencies for dental educators. Notably, the COPDEND guidelines from 2010, which encompass eight domains, appear to be a subset of this broader framework, with only minor variations. Therefore, to complete this scoping review, we mapped the identified EPAs to the competency framework outlined by Chuenjitwongsa et al. (2018).

Practical implications of EPA for dental educators

It is timely and imperative to implement EPAs within Health Professions Education (HPE), including for dental educators. We anticipate that the findings of this study will serve as a foundational step, paving the way for more rigorous research aimed at developing a comprehensive and robust EPA framework for dental educators. The implementation of EPAs is essential in competency-based dental education and plays a crucial role for dental educators by clarifying their roles and expectations.

Table 6 The final forty (40) EPAs were grouped into the seven (7) themes

THEME	No	EPA
Teaching	1	Lecturing (20)
	2	[a]Individual or small group teaching (1,20)
	3	Large group teaching (1)
	4	Teaching lab classes and skills education (20)
	5	Teaching and facilitating learning (23)
Bedside Teaching	6	[a]Conducting bedside teaching (20,21)
	7	Developing bedside teaching (21)
	8	Planning bedside teaching (21)
	9	Conducting bedside teaching assessment (21)
	10	Evaluating bedside teaching (21)
	11	Learner centered bedside teaching (1)
	12	Supervising (clinical) interns (20)
Surgical Teaching Skills	13	Role modelling (22)
	14	Feedback (22)
	15	Surgical scrub (22)
	16	Gowning and gloving (22)
	17	Infection control (22)
	18	Basic suturing skills (22)
	19	Wound management (22)
Mentoring and Coaching	20	[a]Mentoring, tutoring and coaching student (1,20,23)
	21	[a]Mentoring, coaching and advising faculty (23)
Research and Scholarships	22	Writing educational research proposal (23)
	23	Conducting qualitative educational research (23)
	24	Conducting quantitative educational research (23)
	25	Conducting mixed methods and consensus studies (23)
	26	Writing and publishing empirical research reports (23)
	27	Conducting and publishing literature reviews (23)
	28	Presenting at conferences and other meetings (23)
	29	Peer reviewing and editing (23)
Educational Development	30	Conducting educational needs assessments (23)
	31	Developing a curriculum blueprint (23)
	32	Instructional design for a variety of teaching and learning contexts (23)
	33	Designing, applying and revising educational quality assurance (23)
	34	Designing and implementing faculty development (23)
	35	Leading strategic education projects and policy developments(23)
	36	Designing and developing a course (20)
Assessment	37	Assessing written work of students (20)
	38	Developing and administrating tests and establishing results (20)
	39	Assessment of trainee proficiency (1)
	40	Designing, applying and revising student assessment systems (23)

[a]Merged and consolidated

Table 7 Mapping of the EPAs to 12 domain of competencies of dental educator

THEME	NO	EPA	12 competencies of Dental Educators (Chuenjitwongsa et al. 2018)(11)											
			Educational Theories and Principles	Modes of Education	Learner's Issues	Educational Materials and Instructional Design	Assessment and Feedback	Curriculum Matters	Evaluation	Educational Research	Educational Management	Quality Assurance	Patient Care and Healthcare System	Professionalism
Teaching	1	Lecturing(20)		√										
	2	*Individual or small group teaching (1,20)		√										
	3	Large group teaching (1)		√										
	4	Teaching lab classes and skills education(20)		√										
	5	Teaching and facilitating learning (23)	√											
Bedside Teaching	6	*Conducting bedside teaching (20,21)		√										√
	7	Developing bedside teaching(21)		√										√
	8	Planning bedside teaching (21)		√										√
	9	Conducting bedside teaching assessment (21)		√										√
	10	Evaluating bedside teaching (21)		√										√
	11	Learner centered bedside teaching (1)		√										√
	12	Supervising (clinical) interns (20)		√										√
Surgical Teaching Skills	13	Role modelling (22)		√										√
	14	Feedback (22)		√										√
	15	Surgical scrub (22)		√										
	16	Gowning and gloving (22)		√										
	17	Infection control (22)		√									√	
	18	Basic suturing skills (22)		√										
	19	Wound management (22)		√										
Mentoring & Coaching	20	*Mentoring, tutoring and coaching student(1,20,23)	√		√									√
	21	*Mentoring, coaching and advising faculty (23)							√					√

Table 7 (continued)

Research and Scholarships	22	Writing educational research proposal (23)						√					
	23	Conducting qualitative educational research (23)						√					
	24	Conducting quantitative educational research (23)						√					
	25	Conducting mixed methods and consensus studies (23)						√					
	26	Writing and publishing empirical research reports (23)						√					
	27	Conducting and publishing literature reviews (23)						√					
	28	Presenting at conferences and other meetings (23)						√					
	29	Peer reviewing and editing (23)						√					
Educational Development	30	Conducting educational needs assessments (23)				√			√				
	31	Developing a curriculum blueprint (23)			√								
	32	Instructional design for a variety of teaching and learning contexts (23)		√									
	33	Designing, applying and revising educational quality assurance (23)								√			
	34	Designing and implementing faculty development (23)							√				
	35	Leading strategic education projects and policy developments (23)							√	√		√	
	36	Designing and developing a course (20)			√								
Assessment	37	Assessing written work of students (20)		√									
	38	Developing and administrating tests and establishing results (20)		√									
	39	Assessment of trainee proficiency (1)		√									
	40	Designing, applying and revising student assessment systems (23)		√									

This initiative benefits both faculty and educators prior to their enrolment in teaching institutions and throughout their careers. Standardizing teaching practices through EPAs ensures clarity regarding expectations for educators. Additionally, it promotes efforts to achieve competent clinical teaching, thereby enhancing student learning, patient safety, and the overall quality of patient care. EPAs also foster a culture of accountability and professionalism within dental education. Importantly, they provide a clear target for faculty development and continuous professional growth while facilitating entrustment decisions.

Strengths and limitation of this review

A key strength of this review is its rigorous methodology, which follows the Arksey and O'Malley framework and is further enhanced by the Joanna Briggs Institute guidelines. The comprehensive search strategy, conducted across multiple databases and including grey literature, ensures a broad capture of relevant materials. Additionally, the thematic synthesis of the findings provides a structured approach to interpreting the dispersed evidence base. The involvement of multiple expert reviewers, including a senior librarian, contributes to a high-quality search process.

Despite these strengths, several limitations must be acknowledged. The primary limitation is the small number of included studies, as well as the relatively recent emergence of EPAs in dental education, which limit the generalizability of the findings. Second, many articles lacked detailed descriptions of how EPAs were developed, implemented, or assessed, complicating the comparison of methodologies and outcomes across studies. Third, variations in terminology and conceptual understanding of EPAs may have led to the exclusion of relevant studies that used different nomenclature. Additionally, while the review adhered to a systematic methodology using five databases, it is possible that some relevant articles were overlooked, particularly if the search terms appeared only in the text rather than in the title or abstract. Furthermore, screening of references in the included articles was performed with no findings. The findings of this review are based solely on English-language empirical research reports, excluding articles published in other languages. These limitations indicate that findings should be interpreted with caution.

Conclusion and key recommendation

This inaugural scoping review on EPAs specifically targets dental educators. The findings summarize 40 EPAs, which have been systematically categorized into seven themes and mapped to the competencies for dental educators as delineated by Chuenjitwongsa et al. (2018). The review also identifies a substantial gap in this field, underscoring the necessity for additional research to advance the development of dental educators.

Since the five reviewed articles involved general health profession educators as a panel, a key recommendation is to conduct extensive research using a modified Delphi consensus among dental education experts, leveraging the findings here as an initial framework. This approach would ultimately provide more focused EPAs for dental educators. Future research should focus on clarifying the operational definition of EPAs for dental educators and developing standardized processes for their design, implementation, and assessment.

Supplementary information

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Supplementary Material 1.

Supplementary Material 2.

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Authors' contributions

NAB conducted the initial literature search, which was subsequently reviewed by all authors (MAH, MSBY, NSR). The inclusion and exclusion criteria were established through consensus among all authors. Articles were collaboratively reviewed and coded through a consultative process involving all team members. Following this, NAB drafted the manuscript, with MSBY and NSR providing oversight and guidance during the writing process. The final version was reviewed, commented on, and approved by all authors prior to submission.

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Data availability

List of article included in this review are available in a table included as an additional file.

Declarations

Ethics approval and consent to participate

Not applicable. This literature review does not contain any studies with human or animal participants. The data included in the review was secondary data contained in scholarly journal articles.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

[1]Department of Orthodontics, Kulliyyah of Dentistry, Kuantan Campus, International Islamic University Malaysia, Kuantan, Pahang, Malaysia
[2]Postgraduate student, Department of Medical Education, School of Medical Sciences, University Sains Malaysia, Kubang Kerian, Kelantan, Malaysia

[3]Department of Medical Education, School of Medical Sciences, University Sains Malaysia, Kubang Kerian, Kelantan, Malaysia
[4]Centre for Medical Education, University of Dundee, Dundee, United Kingdom
[5]Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor, Malaysia

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References

1. Dewey CM, Jonker G, ten Cate O, Turner TL. Entrustable professional activities (EPAs) for teachers in medical education: Has the time come?, vol. 39. Taylor and Francis Ltd; 2017. p. 894–6.
2. Russell LS, Converting clinician toeducator: Preparation for dental education by continuing professional education. 2016. University of Memphis, Ed.D. Dissertation https://digitalcommons.memphis.edu/etd/1570
3. Hesketh EA, Bagnall G, Buckley EG, Friedman M, Goodall E, Harden RM, et al. A framework for developing excellence as a clinical educator. Med Educ. 2011;35:555–64.
4. Orr G, Porter S, Sharp I. Standards for Dental Educators COPDEND [Internet]. 2013. Available from: http://www.midstaffspublicinquiry.com/report.
5. Wolcott MD, Quinonez RB, Ramaswamy V, Murdoch-Kinch CA. Can we talk about trust? Exploring the relevance of entrustable professional activities in dental education. Journal of Dental Education. Volume 84. John Wiley and Sons Inc. 2020; 945–8. https://doi.org/10.1002/jdd.12354
6. Shorey S, Lau TC, Lau ST, Ang E. Entrustable professional activities in health care education: a scoping review. Volume 53. Medical Education: Blackwell Publishing Ltd; 2019. pp. 766–77.
7. Ten Cate O. Entrustability of professional activities and competency-based training. Medical Education, vol.39, no. 12, 2005, pp. 1176-1177. https://doi.org/10.1111/j.1365-2929.2005.02341.x
8. El-Haddad C, Damodaran A, McNeil HP, Hu W. The ABCs of entrustable professional activities: and overview of entrustable professional activities in medical education. Intern Med J. 2016. https://doi.org/10.1111/imj.12914.
9. Lyon LJ. Developing teaching expertise in dental education. 2009 . Doctoral Dissertation, University of the Pacific. Scholarly Commons. https://scholarlycommons.pacific.edu/uop_etds/2003
10. Bullock AD, Firmstone VR, Falcon HC. Developing guidelines for postgraduate dental educators in the UK. Br Dent J. 2010;208(1):19–23.
11. Chuenjitwongsa S, Bullock A, Oliver RG. Roles and competences for educators of undergraduate dental students: a discussion paper. Eur J Dent Educ. 2018;22(1):47–56. https://doi.org/10.1111/eje.12243.
12. Chuenjitwongsa S, Oliver R, Bullock A. Developing educators European undergraduate dental Students-Towards an agreed curriculum. European Journal of Dental Education, vol.22 . 2018;179–91.
13. Kelly GM, Roberts A, Lynch CD. A literature review: Entrustable professional activities, an assessment tool for postgraduate dental training? J Dent [Internet]. 2022;120:104099. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0300571222001567.
14. Cully JL, Schwartz SB, Quinonez R, Martini A, Klein M, Schumacher DJ. Development of entrustable professional activities for post-doctorate pediatric dentistry education. J Dent Educ. 2023;87(1):6–17.
15. Ehlinger C, Fernandez N, Strub M. Entrustable professional activities in dental education: a scoping review. British Dental Journal. Volume 234 . No. 3. Springer Nature. 2023; 171–6. https://doi.org/10.1038/s41415-023-5503-8
16. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Social Res Methodology: Theory Pract. 2005;8(1):19–32.
17. Peters MDJ, Godfrey C, McInerney P, Khalil H, Larsen P, Marnie C, et al. Best practice guidance and reporting items for the development of scoping review protocols. JBI Evid Synth. 2022;20(4):953–68. https://doi.org/10.11124/JBIES-21-00242.
18. Moher D, Liberati A, Tetzlaff J, Altman DG, Antes G, Atkins D, et al. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Medicine. Volume 6.No. 7. Public Library of Science; 2009. https://doi.org/10.1371/journal.pmed.1000097
19. Abu Bakar N, Roslan NS, Haq MA, Mustafa Byrnes Y, Yusoff MSB. Functional Elements of Entrusted Professional Activities for Dental Educators: Protocol for a Scoping Review. JMIR Res Protoc [Internet]. 2025;14:e74225. Available from: https://www.researchprotocols.org/2025/1/e74225.
20. van Bruggen L, van Dijk EE, van der Schaaf M, Kluijtmans M, ten Cate O. Developing entrustable professional activities for university teachers in the health professions. Med Teach. 2022;44(4):425–32.
21. Rafiq A, Sethi A. Entrustable professional activities for bedside clinical teachers. BMC Med Educ. 2024. https://doi.org/10.1186/s12909-024-05876-3.
22. Khaleeq F, Hayat K, Kumar D, Baloch S, Irfan S, Avinash A. EPas for clinical surgical teaching skills for undergraduate medical and dental clinical teachers. Int J Health Sci (Qassim). 2023;7(S1):2240–9.
23. Gandomkar R, Zaeri R, ten Cate O. Expectations for PhDs in health professions education: an international EPA-framed, modified Delphi study. Adv Health Sci Educ Theory Pract. 2022;27(5):1443–56.
24. Eubank BH, Mohtadi NG, Lafave MR, Wiley JP, Bois AJ, Boorman RS et al. Using the modified Delphi method to Establish clinical consensus for the diagnosis and treatment of patients with rotator cuff pathology. BMC Med Res Methodol. 2016;16(1). https://doi.org/10.1186/s12874-016-0165-8
25. Taylor DR, Park YS, Egan R, Chan MK, Karpinski J, Touchie C, et al. EQual, a novel rubric to evaluate entrustable professional activities for quality and structure. Acad Med. 2017;92(null):S110–7. https://doi.org/10.1097/ACM.0000000000001914
26. Bhandari B, Mehta B, Mavai M, Singh YR, Singhal A. Jigsaw Method of Learning 315 Indian. Vol. 61, no.3, Indian Journal of Physiology andPharmacology. 2017. pp 315-321
27. Jeppu AK, Kumar KA, Sethi A. 'We work together as a group': implications of jigsaw cooperative learning. BMC Med Educ. 2023;23(1),pp.1-8. https://doi.org/10.1186/s12909-023-04734-y

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