Co-funded by
the European Union

SIMULATION-BASED LEARNING IN OCCUPATIONAL THERAPY EDUCATION (SIMBA)

Report on Activity 2, Work Package 2:

A structured narrative literature review to examine occupational therapy competencies and simulation-based learning in occupational therapy education

May 2023

AP UNIVERSITY OF APPLIED SCIENCES AND ARTS ANTWERP

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This publication is a collaborative product of the SIMBA partnership.

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Research, writing and publication co-funded by the Erasmus+ programme of the European Union.

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This document provides a report of activities completed in Work package 2 of the Simulation-based learning in occupational therapy (SIMBA) project (2022-1-BE02-KA220-HED-000088974). It will describe work carried out within Activity Two (WP2 A2) of this Work package, for which the following achievement was defined:

Achievement 1: Conducting a review of the literature to identify competencies and influencing factors for implementing simulation-based learning in occupational therapy education

Introduction/Background

This review of the literature was carried out to collect, analyse and synthesize current information regarding occupational therapy competencies and the application of simulation-based learning in occupational therapy education. The results of this review are subsequently being applied to achieving the first milestone in this Work package – the preparation of a first draft of a *Framework of occupational therapy competencies* and *Guidelines for the application of simulation-based learning (SBL) in occupational therapy education* (MS1.1.) (hereinafter referred to as the *Framework* and *Guidelines)*.

Three indicators were defined within this activity:

- A-priori study protocol describing rationale, hypothesis, and method for literature review
- Precise documentation of the data collection and analysis process
- Final report demonstrating scientific rigour of the literature review

In order to achieve these indicators and conduct the literature review, a structured narrative literature review methodology was applied. This methodology and the study protocol itself will be described in detail in this report and supported by documents found in Appendices. All activities described in this report were completed during the period from January, 2023 to June, 2023.

The leading project partner for this activity was Zdravstveno veleučilište (ZVU), with AP Hogeschool Anterwerpen (AP) acting as supporting partner. The following individuals participated and made direct contributions to the work conducted within this Activity:

- Claire Sangster Jokić, ZVU – activity coordinator; participated in planning and implementing the search and review of the literature, data analysis and synthesis, and preparation of the final report.
- Laurence Magerat, AP - participated in planning and implementing the search and review of the literature, data analysis and synthesis, and preparation of the final report.
- Ivana Klepo, ZVU - participated in planning and implementing the search and review of the literature, data analysis and synthesis, and preparation of the final report.
- Andreja Bartolac, ZVU - participated in planning and implementing the search and review of the literature, data analysis and synthesis, and preparation of the final report.
- Hanne van Tiggelen, AP – provided consultation and feedback during planning and implementation of the literature search and review activities.

Other project partners provided direct input and feedback during development of the research questions and study protocol and will review and provide feedback on the first draft of the *Framework* and *Guidelines*.

Timeline

Figure 1 presents the timeline in which all activities described here were conducted.

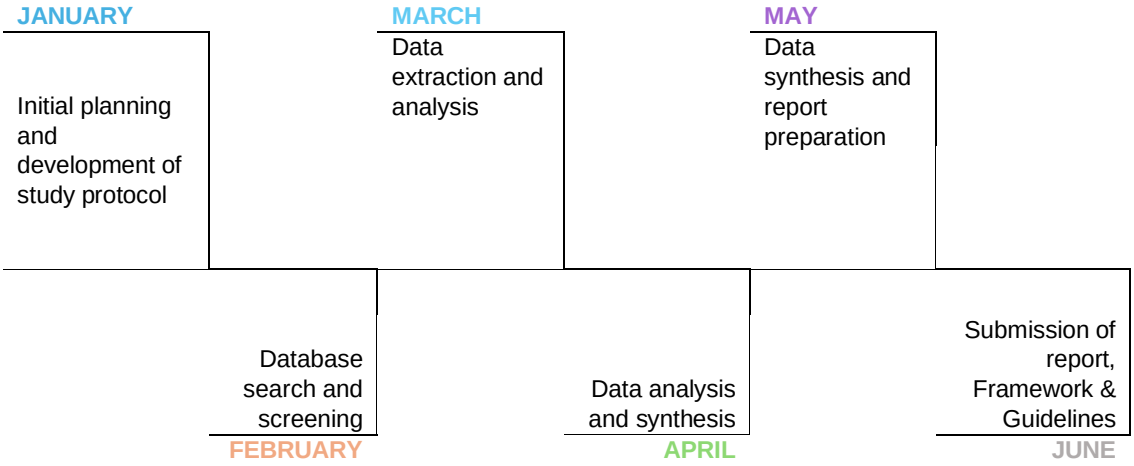

Figure 1: Timeline of activities completed in 2023.

Rationale

As one of the first phases of the SIMBA project, the purpose of this review is embedded within the larger aim of the SIMBA project itself, which is to design and implement a tool kit for simulation-based learning and assessment in the occupational therapy education programmes of the five partner organizations. In health profession education, simulation-based learning practices have been shown to better prepare students for future practice and motivate students to learn in an authentic and supportive learning context (e.g., Colethorpe et al., 2021; Shea, 2015). Using Miller's (1990) model of clinical skill learning and assessment, SBL approaches enable the transition from knowledge-based ('know') to skill-based ('show how') competence. While SBL is commonly used in other professional education programs such as medicine and nursing and has begun to emerge in occupational therapy (OT) education, the design, and delivery of SBL practices in OT is not yet clearly defined (Grant et al., 2021; Imms et al., 2018).

As such, to develop an SBL program that would be effective and appropriate for supporting professional competency development in OT education specifically, the first objective of the project was to develop a *Framework* in which professional competencies expected of a novice occupational therapy practitioner were clearly defined and to construct *Guidelines* for the implementation of SBL in OT education. To do so, it was first necessary to conduct a review of the literature with the following objectives:

1. To gather information about essential professional competencies for the novice occupational therapy practitioner.
2. To gather information about the models, frameworks, methods, practices and approaches for simulation and simulation-based learning used in occupational therapy education.

Research questions and secondary questions

To address the above stated objectives, two research questions were developed for the literature review. Secondary questions were also identified to further demarcate the information being sought and to inform development and implementation of the search protocol.

1. What are the essential professional competencies of a novice occupational therapy practitioner?

a. How are professional competencies of a novice occupational therapy practitioner classified?

b. How is the phased progression of professional competencies formulated across different levels of occupational therapy education?

2. What are the constructs, theories, frameworks, and principles used to inform the implementation of simulation and simulation-based learning in OT education?

a. What constructs, models, theories, and frameworks are applied in the design and implementation of simulation and simulation—based learning in occupational therapy education?
b. What are essential practices and methods used to implement simulation and simulation-based learning in in occupational therapy education?
c. Which professional competences or learning outcomes are addressed using simulation or SBL methods in OT education?
d. Which mediating factors (e.g., learning context, authenticity, educational level) inform the development and implementation of simulation and simulation-based learning in occupational therapy education?

In this review, we have defined *professional competencies* as a combination of knowledge and understanding, interpersonal and practical skills, ethical values and attitudes, and occupational therapy responsibilities that are required for competent occupational therapy practice (European Tuning Occupational Therapy Project Group, 2016). Competence in this instance represents the level (novice-expert or beginner-advanced) at which an individual demonstrates given competency/ies. This review has examined professional competencies expected of a *novice occupational therapy practitioner*, defined as an individual who has successfully completed a pre-registration (undergraduate) education programme in occupational therapy and is deemed eligible to practice as an occupational therapist.

Here, simulation-based learning has been defined as a learning and teaching situation in which simulation is applied as a key pedagogical methodology, where simulation refers to a teaching, learning and assessment methodology that recreates all or part of a clinical or professional experience in which a learner gains experience in performing one or more professional competencies under varying levels of support or guidance. It may apply a variety of modalities and methods, ranging from virtual and computer-systems that reproduce practice situations, simulated patients, role play and case study, whereby competencies applied in fulfilling a professional role with clients are practiced and acquired.

Methods

Search strategy/protocol

The first step in this literature review was the development of a study protocol and search strategy. The study protocol in full is included in Appendix A. In accordance with the overall research objectives, this protocol defined the target literature to be searched under each main research question. For the first research question, this was defined as all literature that presents or discusses a framework for professional competencies in OT education at the university level and could include:

- research papers of any kind
- position statements
- documents presenting and describing competency framework
- policy documents from governments or professional bodies.

For the second research question, target literature was defined as that which presents a framework, model, theory, approach or method for simulation or simulation-based learning in occupational therapy education at the university level and included:

- research papers of any kind
- position statements
- documents presenting and describing framework, model, theory, or approach

- policy documents from governments or professional bodies.

In both cases, grey literature was excluded as a source of literature. A list of keywords was developed based on the research questions and objectives, from which search terms were constructed. The keywords and search terms applied in the search are presented in Appendix B.

Databases in which the searches were conducted were selected to capture a diverse range of academic domains deemed relevant for the research questions: Scopus, Medline, ERIC, EBSCOHost – PsycINFO and Web of Science. Searches were limited to literature in the English language. In addition to the database searches, a targeted search using the Google search engine was conducted to collect key literature not typically included in academic databases that was deemed critical for addressing the research questions. Specifically, this involved a search of websites and documents from national and international occupational therapy associations (e.g., World Federation of Occupational Therapists, Canadian Association of Occupational Therapists, Australian…) for existing frameworks of professional competencies in occupational therapy. Finally, additional searching was conducted via a review of reference lists of the articles identified and included in the review from the databases search.

Database searching was conducted by two researchers for each research question using the search terms and pre-defined inclusion and exclusion criteria. The results of all searches were exported into shared libraries (one for each research question) using the Zotero reference manager.

Inclusion and exclusion criteria

Clear inclusion and exclusion criteria for search and screening procedures were defined in the study protocol. These criteria are presented in Table 1.

Table 1: Inclusion and exclusion criteria

Research question	1 – What are the essential professional competencies of a novice occupational therapy practitioner?	2 – What are the constructs, theories, frameworks, and principles used to inform the implementation of simulation-based learning in occupational therapy education?

Inclusion criteria	• English language
	• Date of publication – From 2008 onwards
	• Full text
	• All evidence that discusses professional competencies of the novice occupational therapy practitioner
	• Source of evidence:
	  ○ primary research studies
	  ○ literature reviews (narrative, systematic, scoping review, meta-analysis)
	  ○ frameworks, guidelines
		• English language
		• Date of publication – From 1998 onwards
		• Full text
		• All evidence that discusses a theory, framework, model, approach, method or outcome for simulation or simulation-based learning in post-secondary occupational therapy education
		• Source of evidence:
		  ○ primary research studies
		  ○ literature reviews (narrative, systematic, scoping review, meta-analysis)
		  ○ frameworks, guidelines

Exclusion criteria	• Literature for which the full text is not available • Literature from databases without an abstract • Unpublished papers (e.g., thesis, conference abstracts) • Literature about occupational therapy competencies beyond pre-registration	• Literature for which the full text is not available • Literature from databases without an abstract • Unpublished papers (e.g., thesis, conference abstracts) • Literature that discusses simulation or simulation-based learning in disciplines other than occupational therapy

	education level (i.e., graduate or post-graduate – MSc, PhD) • Literature that discusses competencies specific to a distinct practice area or geographical context • Opinion papers and book reviews	• Literature that did not primarily use simulation for educational purposes of students (e.g., in practice) • Literature that discusses simulation, but where IPE (interprofessional education) is the central aim • Opinion papers and book reviews

Screening and selection (data collection)

Database searches revealed a total of 2 288 and 2 068 results for research questions one and two, respectively. Following removal of duplicates, the total number of results were 1 855 (RQ1) and 1 480 (RQ2). To determine eligibility for inclusion in the review, these results were screened inside the Zotero reference manager by two researchers using the criteria defined in the study protocol. During screening, results that could not be immediately and equivocally included or excluded based on title or abstract alone were placed in a 'to discuss' folder. Questions that arose regarding these results were related to deciding whether to include literature that was focused on a specific practice area, context or competency that may not have relevance or applicability to achieving a broader understanding of professional competencies or the application of SBL in occupational therapy. These questions were resolved through discussion and review of results with all researchers, which resulted in a clearer delineation of inclusion/exclusion criteria. Using the refined criteria, all instances of undecided inclusion were resolved. Upon completion of the screening process, a total of 27 and 54 results were included in the final collection of literature assessed for eligibility for research questions one and two, respectively. Using the guidelines proposed by Page et al. (2021), the PRISMA diagrams presented in Appendix C provide an overview of the data collection and screening process for both searches. A full bibliography of included literature is included in Appendix D.

Data extraction

Following screening, full texts were retrieved for all included results. These texts were reviewed in their entirety to confirm eligibility for inclusion in the review, which resulted in the exclusion of 3 and 18 results from the OT competency and SBL in OT searches, respectively. Reasons for exclusion included articles that did not discuss competencies or SBL for occupational therapy specifically, that were outside the defined period of publication, or presented a framework or model from an already included article. The remaining literature (23 works for OT competencies and 37 works for SBL in OT) was included in the data extraction process. Here, each full text was carefully reviewed and, using pre-defined data extraction categories based on the concepts and themes included in the research questions, data identified as relevant for addressing the research questions was extracted and recorded in two data extraction spreadsheets. This included general source data as well as specific information that, depending on the nature of the document, was related to the aim, scope and context of the study, framework, theory, or model presented in the work; the content and structure of the presented framework, model, or theory; key features of the simulation described in the work; study methodology and outcomes; strengths and limitations; etc.

Data analysis/synthesis

Following data extraction, analysis of data extracted from the OT competencies and SBL in OT literature continued separately for research questions one and two, respectively. Each analysis process will be described in the following paragraphs.

Analysis of occupational therapy competencies data

Analysis of the literature on OT competencies began with the exportation of all extracted data that referred to a specific competency into the Quirkos software for qualitative data analysis. Here, a detailed thematic content analysis was carried out using a combined inductive-deductive coding technique in which individual

competencies were coded and clustered into competency domains by one researcher. These domains were initially defined based on a preliminary review of existing OT competency frameworks included in the literature review and reflected the key competency domains identified across many frameworks. During this coding process, additional domains or sub-domains were created when data pertaining to competencies that could not be categorized in the preliminary coding structure or could more accurately be categorized and organized as a specific group of competencies were identified.

The results of this initial coding analysis were then reviewed by the first researcher together with a second researcher in a gradual and data-driven analytical process that allowed for the reorganization of codes and clusters into categories that reflected common competency domains. Coded data in each domain was reviewed to confirm that codes and code categories accurately reflected the data. This process allowed for the graduated development of a final structure of competency domains in which all unique competencies identified in the data were coded and classified.

To address the secondary research question that pertained to how the progression of OT competency development is described, data extracted from the included literature in which a framework or model describing competency development were analysed separately using narrative content analysis.

Analysis of SBL in occupational therapy data

To address the questions posed under the second research question, a detailed thematic content analysis of extracted data was conducted to identify:

- models, theories and frameworks applied in the design and implementation of simulation and simulation-based learning in occupational therapy education principles of SBL
- essential practices and methods used to implement simulation and simulation-based learning in in occupational therapy education
- professional competences or learning outcomes addressed using simulation and simulation-based learning in occupational therapy education
- mediating factors (methodological, contextual) that inform the development and implementation of simulation and simulation-based learning in occupational therapy education

Using the NVIVO software for qualitative analysis, one researcher conducted a grounded, inductive thematic analysis of all extracted data. This resulted in the development of a thematic coding structure reflecting the specific concepts and questions of interest. This coding structure and all coded data were subsequently reviewed by the first researcher and an additional two researchers, during which code definitions and code/cluster structure were clarified and refined. Using the final coding structure, the coded data was synthesized into a descriptive summary of analysed data that addresses the posed research questions.

Post-hoc analysis

In a post-hoc analysis phase, data extracted from the literature that pertained to the specific competencies being addressed using simulation or SBL methodology in OT education were mapped onto the framework of competency domains that arose from the analysis of the literature on OT competencies. This allowed us to address research question 2c, or rather to determine which professional competencies and competency domains are most commonly addressed using simulation methodology in OT education.

The descriptive syntheses of the analysis processes described here formed the basis for preparing the first drafts of the *Framework of occupational therapy competencies* and *Guidelines for application of SBL in OT education*. While a summary of the results of the literature review is presented in the following section, these draft documents (*Framework* and *Guidelines*) represent the full results of this review of the literature.

Brief overview of results

Data from the included literature was extracted and categorized according to key questions, topics, and concepts of interest into two data matrices for the OT competency and SBL in OT literature, respectively. The results of this analysis (i.e., data extraction matrices) can be made available upon reasonable request. As previously mentioned, this process was carried out separately for the literature on OT competencies and literature on SBL in OT education.

Extracted data matrices were subsequently used in ongoing thematic content analysis. To address research questions 1 and 1a, initial analysis and thematic coding of extracted data from the OT competencies literature produced the coding structure presented in Figure 2, which represents the categorization of data into common competency domains identified in the literature. Here, the frequency of codes falling under each category is also presented.

Figure 2: Schematic representation of the results of initial thematic content analysis of OT competency literature (Quirkos)

These results underwent a second analysis, in which code clusters were further reviewed, refined, organized, and grouped according to shared characteristics. This produced a final structure of six competency domains, under which code clusters (representing unique categories of competencies under each domain) were grouped. This framework is presented in Figure 3. The full results of this analysis and a detailed description of competencies included in each domain are presented in the final outcome of this review and the first milestone in this Work package - the first draft of the *Framework of occupational therapy competencies.*

Figure 3: Classification of occupational therapy competency domains based on thematic content analysis of OT competency literature

To answer research question 1b, data extracted from the OT competency literature that identified a specific framework, model, or method for describing or measuring competency development or skill acquisition was reviewed through a narrative content analysis. Although this represented a very small portion of the extracted data, this analysis identified several frameworks used in the literature to describe and measure OT competency development. The results of this analysis and discussion of these frameworks are presented in the *Framework of occupational therapy competencies.*

The second group of research questions examining models, theories, frameworks, essential practices, and mediating factors informing the development and application of SBL methodology in occupational therapy education were addressed through thematic content analysis of the data extracted from the included literature examining SBL in OT education. This process was guided by a schematic structure of key concepts derived from the research questions, into which extracted data was organized and categorized. This coding process was iterative in nature, during which codes and code categories gradually arose and evolved to capture the content and meaning of all extracted data. The codes and code categories produced during this process are presented in Appendix E, which presents a table derived from the original Codebook. During initial coding, these codes were gradually organized into a larger framework of eight domains that pertained to various elements included in the research questions. This framework is presented in Table 2 and was subsequently used in ongoing analysis and synthesis of the data.

Subsequent review of this coded data by three researchers allowed for the confirmation of overall code structure, clarification of code definitions and checking that codes accurately reflected the content of the data. This also contributed to a gradual thematic synthesis of data included under each code category, which in turn resulted in a descriptive presentation of findings under the main conceptual themes housed within the research questions. These results will be presented in the second milestone of this Work package – the first draft of the *Guidelines for the application of SBL in OT education*.

Table 2: General framework of coded data after thematic content analysis (NVIVO)

Code cluster	Name	Description
1	SBL definition	Data that pertains to a general definition of simulation or SBL
2	Basic requirements	Data that identifies the basic prerequisites for the successful implementation of SBL in OT education
3	Outcome_impact	Data that discusses the measured outcomes or impact of SBL in OT education
4	Participants (educators, students)	Data that describes or discusses attributes of participants in SBL (e.g., experience, expectations, roles, learning style...)
5	Prerequisite knowledge_ skills	Data that identifies prerequisite learner knowledge/skills for SBL
6	Simulation experiences_ simulation process	Data that relates to the specific practices, steps, elements or methods used in implementing SBL in OT education
7	Feedback - briefing activity	Data that discusses methods, practices, or key elements in briefing and/or feedback processes applied in SBL
8	Quality of simulation design	Data that discusses key factors influencing quality of SBL (e.g., fidelity, grounded in educational theory, implementation guide, technical resources...)

Finally, a post-hoc analysis was carried out to identify which competencies are currently being addressed using simulation methodologies in occupational therapy education. Here, data extracted from the SBL in OT education literature that identified a specific competency (knowledge, skill, or attitude) being addressed using simulation was mapped onto the competency domains identified through the analysis of the OT competency literature. Table 3 presents the frequencies with which competencies from each domain were identified as those being addressed using simulation methodology. From these results, it is evident that application of simulation methodology in OT education is predominantly addressing competencies in two domains: conducting the OT process and professional reasoning; communication and professional relationships. A full discussion of this analysis is presented in the first draft of *Framework of occupational therapy competencies*.

Table 3: Frequency and type of professional competencies identified in the literature examining SBL in OT education

Domain	Examples from extracted data in SBL in OT literature	Frequency
A: Knowledge and attitudes	Knowledge in a specific practice area or attitudes towards client group, lived experiences, etc.	Know: 2 Att: 2
B: OT process and professional reasoning	General reasoning skills: decision making, problem solving; Specific OT process skills: diagnose client-specific occupational problems, safe transfer techniques, client-centred interview…	58
C: Communication and professional relationships	General and specific skills related to communication and establishing rapport/relationship with client or team/colleagues.	19
D: Professional autonomy / responsibility	General competencies: exhibiting professional behaviours, understanding the profession and establishing professional identity, developing autonomy, self-reflection.	9
E: Advocating for profession or social change	No data identified under this domain.	0
F: General skills	General competencies: self-efficacy, confidence in working with specific groups, self-directedness. Specific non-OT competencies: following infection control guidelines, using safe body mechanics.	14

Non-domain specific outcomes	General outcomes of SBL: expand knowledge, skills and experience; better preparedness for fieldwork, practice in safe environment, acquisition/testing minimum competency standards.	10

Conclusion

The structured narrative literature review described in this report allowed for a detailed analysis of current literature examining two key topics of interest in this project: essential professional competencies in occupational therapy and the application of SBL methodology in occupational therapy education. Defined under Activity Two of Work package 2 of the SIMBA project, it has enabled the achievement of the identified indicators:

- A-priori study protocol describing rationale, hypothesis, and method for literature review
- Precise documentation of the data collection and analysis process
- Final report demonstrating scientific rigour of the literature review

The results of this review have enabled the preparation of first drafts of two key documents (the *Framework* and the *Guidelines*) that will serve as a foundation for future activities in the project. In their final forms, these documents will be a resource for developing, piloting, and implementing methodologies for simulation-based learning and assessment in the occupational therapy education programmes of five partner programmes.

Prior to this, the *Framework* and the *Guidelines* will undergo further review, revision, and validation in the ongoing activities of this Work package. This will include a consultation process in which two focus group studies will be conducted to gain insight into the perspectives of key informants regarding professional competencies of occupational therapists, the manner in which these competencies are acquired, and the potential of SBL in OT Education for supporting competency acquisition and assessment. In the first phase of this process, focus groups will be conducted by each project partner (representing OT education programmes in five different European contexts) with stakeholders from three profiles: OT educators, OT students, OT practitioners. Participants in these focus groups will be invited to share their perspectives and experiences on key professional competencies for occupational therapists and the use of SBL methodologies in OT education. Second, an expert focus group will be conducted in which individuals with expertise in the design, development, and implementation of simulation and SBL in higher education will be invited to review and provide feedback on the *Framework* and *Guidelines*. Analysis of the data collected during the focus groups will inform a review and revision of these documents.

Revision of the first draft of the *Guidelines* will be additionally informed by a post-hoc comparative analysis of the findings of this literature review with key literature on simulation and simulation-based learning from other health profession disciplines (nursing, medicine, physical therapy, speech-language pathology). In this way, the Guidelines will be informed by the wider simulation and SBL literature but also remain grounded in current evidence for its' implementation in occupational therapy education and for the acquisition of competencies specific to occupational therapy.

Finalized and validated versions of the Framework and Guidelines are expected to be completed by the end of 2023.

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Appendix A: Study protocol for structured narrative literature review (WP2 A2)

Activity Two (WP2 A2): To identify competences and influencing factors for application of SBL in occupational therapy programs
Milestone (MS1.1): First draft of framework (SBL in OT education)

Methodology: Structured narrative literature review *Time frame*: February - May 2023.

Plan for the literature review:

	Framework of professional competences in occupational therapy	**Guidelines for application of SBL in occupational therapy education**
	Review aims and questions	
Review question (general statement of review topic)	What are the essential professional competences of a novice occupational therapy practitioner?	What are the constructs, theories, framework and principles used to inform the implementation of simulation-based learning in occupational therapy education?
Objective (specific statement of aim of review)	To gather information and construct a framework of essential professional competences for the novice occupational therapy practitioner.	To gather information about the models, frameworks, methods and approaches for simulation and simulation-based learning used in occupational therapy education.
Secondary questions (additional information we seek about the topic)	• How are professional competences of a novice occupational therapy practitioner classified? • How is the phased progression of professional competences formulated across different levels of pre-registration occupational therapy education?	• What constructs, models, theories and frameworks are applied in the design and implementation of simulation and simulation—based learning in occupational therapy education? • What are essential practices and methods used to implement simulation and simulation-based learning in in occupational therapy education? • Which professional competences or learning outcomes are addressed using simulation or SBL methods in OT education? • Which mediating factors (e.g., learning context, authenticity, educational level) inform the development and implementation of simulation and simulation-based learning in occupational therapy education?
	Search strategy	
What?	Literature that presents a framework for professional competences in OT education at the university level: • research papers of any kind • position statements	Literature that presents a framework, model, theory, approach or method for simulation or simulation-based learning in occupational therapy education at the university level: • research papers of any kind

	• documents presenting and describing competence framework • policy documents from governments or professional bodies	• position statements • documents presenting and describing framework, model, theory or approach • policy documents from governments or professional bodies

Where?	• Google – Websites of (inter)national occupational therapy associations
	  ○ WFOT
	  ○ ENOTHE
	  ○ COTEC
	  ○ National associations (CAOT, AOTA, Australian...)
	• Databases:
	  ○ Scopus
	  ○ Medline
	  ○ ERIC
	  ○ EBSCO - PsycINFO
	  ○ Web of Science
		• Databases:
		  ○ Scopus
		  ○ Medline
		  ○ ERIC
		  ○ EBSCO - PsycINFO
		  ○ Web of Science
		• Review of reference lists of the articles included from database search

Inclusion criteria	• English language
	• Date of publication – From 2008 onwards
	• Full text
	• All evidence that discusses professional competences of the novice occupational therapy practitioner
	• Source of evidence:
	  • primary research studies
	  • literature reviews (narrative, systematic, scoping review, meta-analysis)
	  • frameworks, guidelines
		• English language
		• Date of publication – From 1998 onwards
		• Full text
		• All evidence that discusses a theory, framework, model, approach, method or outcome for simulation or simulation-based learning in post-secondary occupational therapy education
		• Source of evidence:
		  • primary research studies
		  • literature reviews (narrative, systematic, scoping review, meta-analysis)
		  • frameworks, guidelines

Exclusion criteria	• literature for which the full text is not available • literature from databases without an abstract • literature about occupational therapy competences beyond pre-registration education level (i.e., graduate or post-graduate – MSc, PhD)	• literature for which the full text is not available • literature from databases without an abstract • unpublished papers (e.g., thesis, conference abstracts) • literature that discusses simulation or simulation-based learning in disciplines other than occupational therapy

	• literature that discusses OT competences specific to a distinct practice area or cultural/geographical context • opinion papers • book reviews	• literature that did not primarily use simulation for educational purposes of students (e.g., in practice) • Literature that discusses interprofessional competence (IPE)
Search terms (keywords)	Appendix B: List of keywords and search terms for structured narrative literature review	Appendix B: List of keywords and search terms for structured narrative literature review
Evidence screening and study selection	Two reviewers for each step • evidence screening • exporting evidence from databases (Zotero) and removing duplicates • titles and abstracts screening followed by full text screening using inclusion/exclusion criteria • no methodological quality assessment	Two reviewers for each step • evidence screening • exporting evidence (Zotero) and removing duplicates • titles and abstracts screening followed by full text screening using inclusion/exclusion criteria • no methodological quality assessment
Data extraction	Shared data extraction table: • source data (author, year, …) • source type (research, review...) • aim of framework/theory • content of theory/ framework (structure, classification of competences) • strengths/weaknesses of the theory/framework, • application setting (context) • …	Shared data extraction table: • source data (author, year, journal, …) • source type (research article, review…) • aim of model/framework/theory/approach/method • content of theory/ framework/method/approach, • strengths/weaknesses of the theory/framework, • application setting (participants, country/context, simulation modality) • outcomes...

Data analysis	Content analysis to identify: • shared/unique professional competences • classification of professional competences • approaches to describing progression of competence development	Thematic content analysis to identify: • models, theories and frameworks applied in the design and implementation of simulation and simulation-based learning in occupational therapy education principles of SBL • essential practices and methods used to implement simulation and simulation-based learning in in occupational therapy education • professional competences or learning outcomes addressed using simulation and simulation-based learning in occupational therapy education • mediating factors (methodological, contextual) that inform the development and implementation of simulation and simulation-based learning in occupational therapy education
Data synthesis 1 (at level of individual research question)	Descriptive synthesis of data into single competence framework	Descriptive synthesis/summary of content analysis
Data synthesis 2 (post-hoc analysis)	1. Data mapping of professional OT competences that are (or can be) addressed through simulation-based learning and assessment. 2. Post-hoc comparative analysis of review findings with key literature on simulation and simulation-based learning from other health profession disciplines (nursing, medicine, physical therapy, speech-language pathology): • Systematic/scoping reviews of the literature • Guidelines for simulation and SBL from (inter)national associations and networks for simulation and/or SBL or university faculties or programmes	
Application/ integration (i.e., preparing draft)	Results of the preliminary analysis, synthesis and post-hoc analysis of the data included in the literature review described in this protocol will be used to prepare, validate, and revise drafts of a *Framework of occupational therapy competencies* and *Guidelines for implementation of simulation-based learning in OT education*. In this way, these documents will reflect a full presentation and discussion of the overall results of this narrative literature review.	

Appendix B: List of keywords and search terms for structured narrative literature review

Review question 1: *What are the essential professional competencies of a novice occupational therapy practitioner upon completion of pre-qualification OT education?*

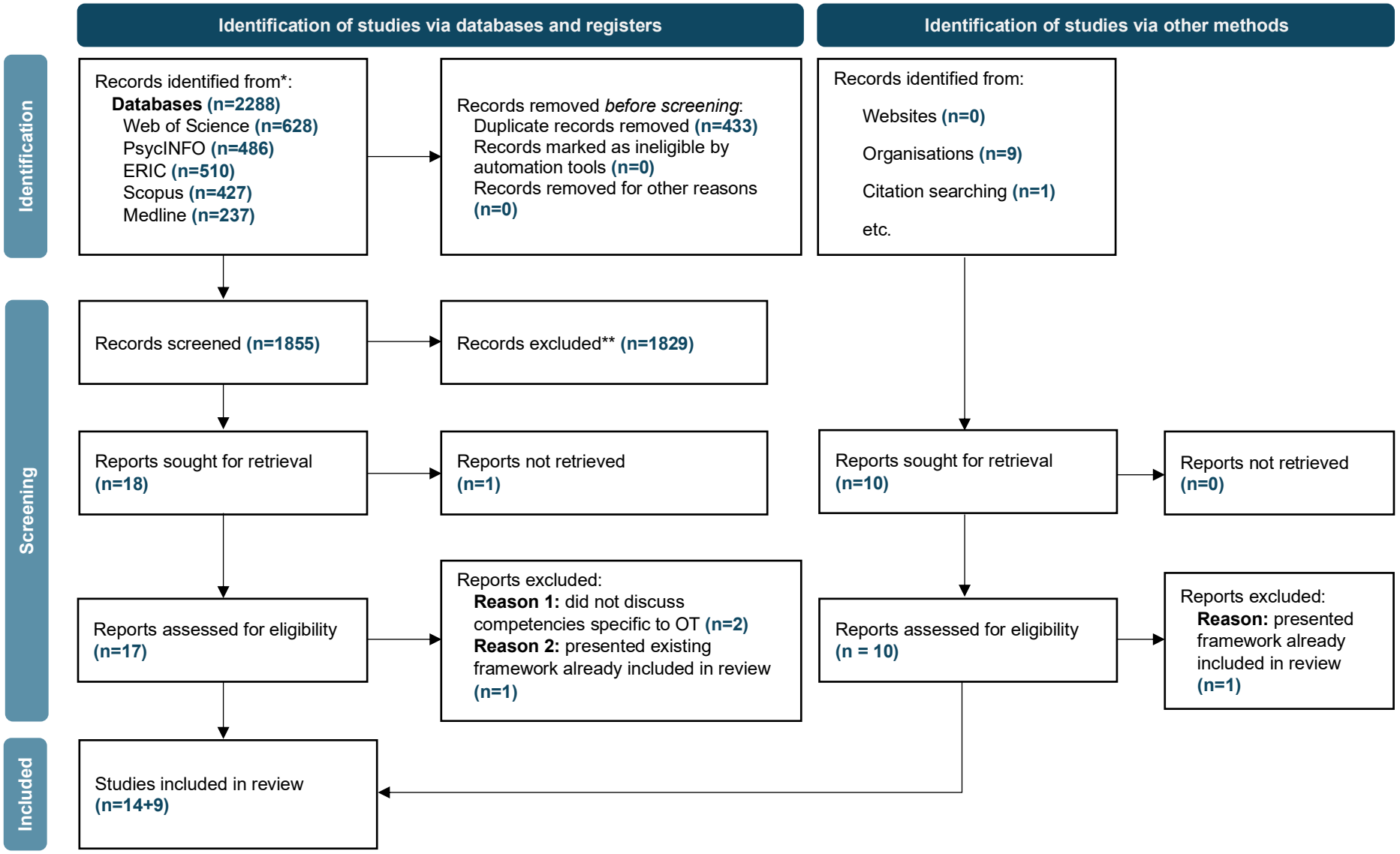
Key concept	Synonyms	Search terms/keywords	Subject terms /headings
• Professional competences	• Competences • Clinical competences • Professional skills • qualification • Learning outcomes	competenc* **OR** "clinical competences" **OR** "professional skills" **OR** qualification **OR** "learning outcome" **AND**	Some databases offer subject terms or headings, so it should be searched as well
• Entry level	• Bachelor degree • Newly qualified • Novice; Beginner • Curriculum • Education • Pre-qualification	"Bachelor degree" **OR** "newly qualified" **OR** begin* **OR** curriculum **OR** educat* **OR** "pre-qualification" **OR** novice **AND**	
• Occupational therapy practitioner	• Occupational therapy • Occupational therapist	"occupational therapy" **OR** "occupational therapist" **OR** OT	

Review question 2*: What are the constructs, theories, frameworks, and principles used to inform the implementation of simulation and SBL in OT education?*

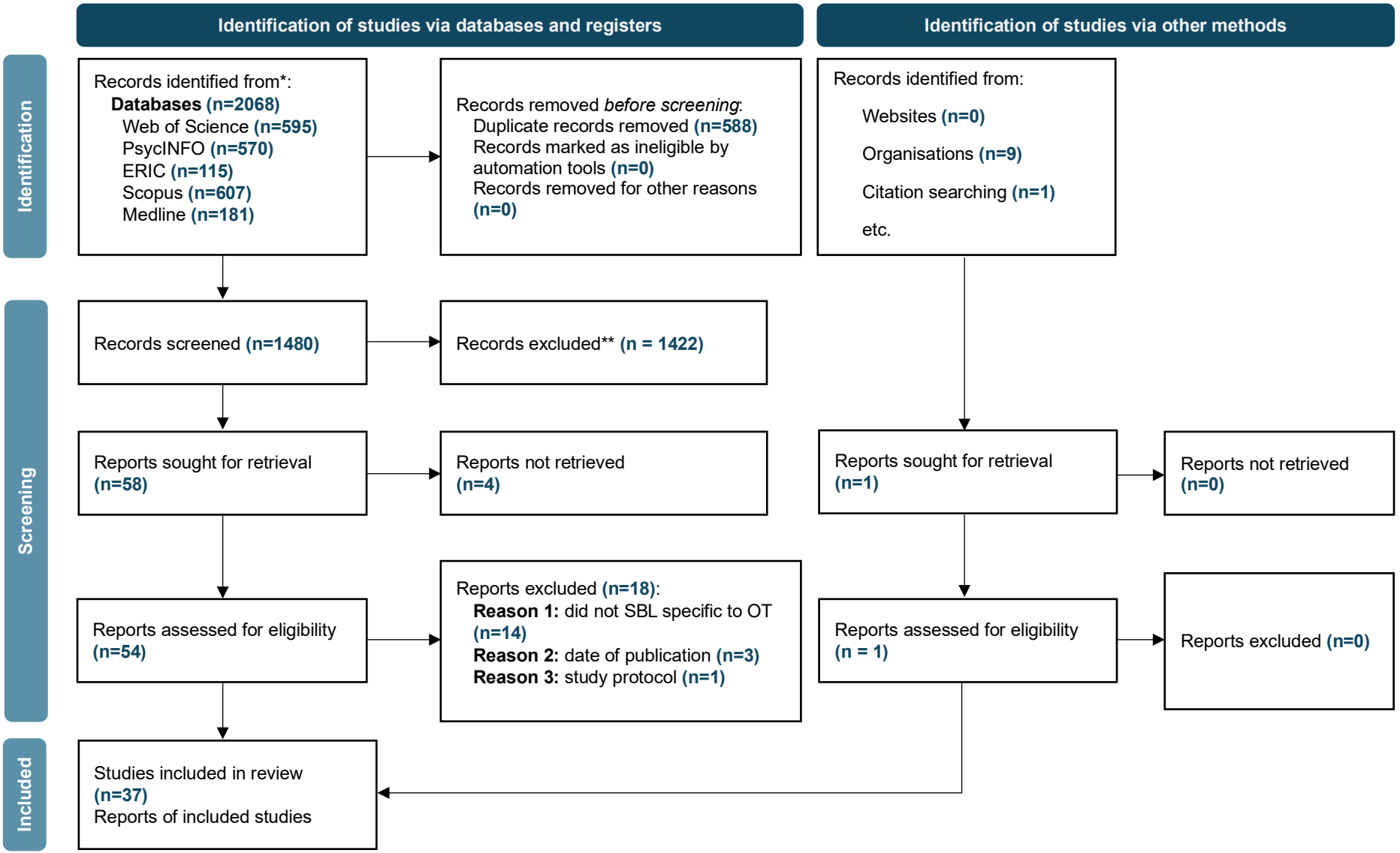
Key concept	Synonyms	Search terms/keywords	Subject terms/headings
• Simulation/simulation-based learning	• Simulation • Simulation theory • Simulation framework • Concept of simulation • Human simulation • Patient simulation • Standardized patient • High fidelity • Role play; Case study/scenario	simulat* **OR** "simulation theory" **OR** "simulation framework" **OR** "concept of simulation" **OR** "simulation based learning" **OR** "patient simulation" **OR** "standardized patient" **OR** "high fidelity" **OR** "role play" **OR** "case study" **OR** "virtual reality" **OR** "authentic learning" **AND**	Some databases offer subject terms or headings, so it should be searched as well
• Education	• Curriculum • Teaching • Learning • Assessment	educat* **OR** curriculum **OR** teach* **OR** learn* **OR** assess* **AND**	
• Occupational therapy	• Occupational therapy • Occupational therapist	"occupational therapy" **OR** "occupational therapist" **OR** OT	

Appendix C: Prisma 2020 Flow diagrams

Search and screening of literature on occupational therapy competencies



Search and screening of literature on simulation and simulation-based learning in occupational therapy



Appendix D: Bibliography of included literature

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Appendix E: Table of thematic code categories and codes generated from SBL Codebook

Available upon reasonable request.