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Protocol for a scoping review on the conceptualization of learning in undergraduate clinical nursing practice

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Protocol for a scoping review on the conceptualization of learning in undergraduate clinical nursing practice

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2337

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ABSTRACT

Introduction: Learning in the hospital setting is a major form of learning in undergraduate nursing education. In spite of this, how nursing students learn in clinical practice is still largely unknown. Moreover, there is no conceptual clarity on learning in practice in the current literature. This paper aims to set up a protocol for a scoping review of the literature in order to map different conceptualizations of learning in practice in undergraduate clinical nursing practice in the hospital setting. A secondary aim of the full review is to eventually suggest terminology that can be used to guide future studies.

Methods and analysis: This scoping review will be guided by the methodological framework proposed by Arksey and O'Malley and refined by Levac et al. and the Joanna Briggs institute. The search strategy will be developed together with a research librarian and the search will be performed in electronic databases (PubMed, Ebsco/ERIC and Ebsco/CINAHL). In a first search, we will identify concepts that are used as an equivalent to learning in practice. Next we will search for studies operationalizing these concepts in undergraduate nursing education. Finally, we will check reference lists for additional publications. Abstracts and full-text studies will independently be screened by two researchers. All studies that have 'learning in undergraduate clinical nursing practice' as their main topic and that include a definition of operationalization of an equivalent to learning in clinical practice, will be considered for inclusion. We will chart different conceptualizations and their theoretical underpinnings, as well as reported learning opportunities, informal and formal aspects of learning, social aspects of learning and gaps in the literature.

Ethics and dissemination: This review will help design future studies on learning in clinical nursing practice using well-defined and agreed upon terminology. The results will be disseminated through journal publications and conference presentations.

ARTICLE SUMMARY

Strengths and limitations of this study

- This protocol outlines a rigorous design that includes an established research framework, a search strategy and a selection process.
- The search strategy includes different databases with peer-reviewed literature, with no restrictions to the study design or the publication date.
- The assessment of the quality of the included papers will enable identifying gaps in the literature.

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- A limitation is that the literature search only covers undergraduate nursing education, while a comparison with literature on learning in practice in other health professions would enrichen our understanding of potential conceptualizations.
- This study does not include books, book reviews or grey literature. However, systematically examining peer reviewed research will enable us to get a comprehensive view of the literature on this topic.

INTRODUCTION

Learning in the hospital setting is crucial for becoming a competent nurse[1]. Clinical settings provide for unintended and unplanned learning[2], which functions as the major form of learning in nursing education[3]. However, how nursing students learn in clinical practice is still largely unknown. For example, there is a lack of insight in how to predict individual learning outcomes, or which learning opportunities best promote students' learning [4]. Understanding learning in the clinical setting can help design, supervise and evaluate individual learning trajectories and their outcomes in practice. This study aims to set up a protocol for a scoping review to examine how different concepts that are equivalent to 'learning in practice' are used and operationalized in the literature.

In the educational literature, the concept of 'learning in practice' has been widely studied in the context of workplace learning[5] or practice learning as part of an education program[6]. However, there is no unified definition or approach towards this concept[7]. Learning in practice is often distinguished from learning in the classroom setting as informal opposed to formal learning, where informal learning arises in situations where learning is not the primary aim[8]. However, some authors question the validity of a dichotomy between formal and informal learning[9], and state that every learning situation contains both formal and informal elements[10]. This would particularly apply for clinical placements, which are characterized by a constant interplay of the 'reality' of clinical practice and formal learning interventions such as feedback and assessment[11]. It would therefore be valuable to identify formal and informal aspects while investigating nursing students' learning. This will give curriculum developers and educators a view on how and to what extent learning and practice can be integrated in the curriculum. Another essential characteristic of workplace learning is its social rather than individual nature[12]. That is, learning occurs in interaction and dialogue with others [8]. Therefore, while exploring learning in practice, the nature of social interactions involved in the learning process, has to be taken into consideration.

In the nursing education literature, just as in other health professions education literature, different terms are used to describe and study learning in clinical practice, with different theoretical

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underpinnings. Moreover, the rationale behind the application of the concepts used is not always clarified. Therefore, it is not always clear whether these different terms refer to the same concept, and how they are defined in terms of learning content (skills, knowledge, values), process (implicit, explicit), and control (intended or unintended, guided or not guided). Also, different researchers appear to apply the same concept differently. Having clear and agreed upon terminology can help design future studies that can contribute to understanding learning in clinical practice along with its limitations so that clinical placements can be organized for optimal benefit of the students.

The goal of this scoping review is to provide guidance for the use of concepts that describe learning in undergraduate clinical nursing practice in future studies. This study therefore aims to examine how different concepts that are equivalent to 'learning in practice' are used and operationalized in the literature. We will particularly consider how formal and informal aspects of learning, as well as the social component of learning are included in these operationalisations. Wherever possible, we aim to map which concrete learning opportunities are distinguished in the literature. A body of work on concepts to describe learning in practice does exist outside nursing education literature[13]. To our knowledge, the only study that included distinct concepts of learning in clinical practice in a review before, was a content analysis of work-based learning in health care education by Manley, et al. [14]. The authors identified common attributes, enabling factors and consequences of workplace learning and proposed a definition. The current review will build on this work by closely examining different concepts of learning in practice in the context of undergraduate nursing education. Assessing the strengths and weaknesses of the use of different concepts within this particular context, will enable us to make suggestions for the use of terminology as well as to address gaps in the literature. Also, the current will include literature after 2009 when Manley, et al. [14] conducted their study. In interpreting our findings, we will consider the broader body of literature on learning in practice.

METHODS AND ANALYSIS

We decided to use the scoping review approach to map the different concepts that are used to study learning in clinical nursing practice. Since the lack of a focused line of inquiry requires a broad research question, we consider a scoping review to be more appropriate than a systematic review. Scoping can help understand complex concepts when there is a lack of focused lines of research identified through clarifying definitions and conceptual boundaries[15]. Scoping will also enable us to identify key concepts, gaps in the literature, and types and sources of evidence to inform practice, policymaking, and research[16]. To get a comprehensive picture of the existing research, we will include studies with different designs. Since scoping reviews are hypothesis-generating rather than hypothesis-testing , this review can provide a stepping off point for further research.

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Standardized reporting guidelines can help the critical appraisal of reviews and thereby increase their reproducibility, completeness, and transparency[17]. For systematic reviews, the PRISMA-P checklist has been developed to facilitate the preparation of a robust research protocol[18]. PRISMA guidelines for scoping reviews are still under development[19]. We therefore used relevant items of the PRISMA-P (Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols) to draft this protocol, as outlined in additional file 1.

To ensure rigor in reporting the methodology, we will use the six-stage approach developed by Arksey and O'Malley [20] and refined by Levac, et al. [21] and the Joanna Briggs institute [22] (1) identifying the research question; (2) identifying relevant studies; (3) selecting studies; (4) charting the data; (5) collating, summarizing and reporting the results; (6) expert consultation (optional and included).

1. Identify the research question

Since our aim is to understand how learning in undergraduate clinical nursing practice is conceptualized in the current literature irrespective of research design and outcome, our research question is:

- How are different concepts that are used as an equivalent to learning in the hospital setting operationalized in the undergraduate nursing education literature?

As scoping is an iterative process [20], we might add additional questions based on our findings along the research process. While the primary aim of this review is to propose terminology describing learning in clinical practice by undergraduate nursing students, we also provide a narrative account of learning opportunities mentioned, as well as social, formal and informal aspects of learning in practice.

2. Identify relevant studies

The search strategy will be iteratively developed by the research team. As suggested by the Joanna Briggs institute [22],we will start with a very broad search to inform our subsequent search strategy. A comprehensive search strategy will be developed (by MS and JCFK) to conduct this stepwise search process following the Peer Review of Electronic Search Strategies (PRESS) 2015 guideline statement [23].

In an initial search (search step 1), we will combine the terms 'learning in clinical practice' and 'undergraduate nursing students'. The search query for both steps will first be developed for PubMed and later extended to Ebsco/ERIC and Ebsco/CINAHL to identify different concepts in the

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literature that are used as an equivalent to 'learning in clinical practice' by nursing students. See our draft search in the additional file 2 for step 1 of our search. The first 100 search results from each database will be reviewed by the researchers to assess validity of the search strategy. When agreement has been reached about the initial search strategy, the first 200 abstracts will be scanned by the two reviewers (MS and RAK) on concepts potentially eligible for inclusion in the second search step. Eligible concepts are concepts that describe the process of learning to become a nurse within the clinical context ('such as 'experiential learning' or 'informal learning'), rather than specific aspects or (such as 'skill acquisition' or 'peer learning'). In case of full agreement between the two reviewers on potentially eligible concepts, the first reviewer will screen the rest of the abstracts. In case of disagreement, the second author will scan another 200 abstracts until full agreement is reached. After all abstracts have been screened, the two reviewers will discuss all potentially eligible concepts and select concepts to be included in the second search step.

After having selected the different concepts, we will develop a search query (search step 2) in PubMed and subsequently extend to Ebsco/ERIC and Ebsco/CINAHL combining each of the identified concepts with 'undergraduate nursing' to find studies operationalizing one of the identified concepts in the literature on nursing students' learning in the hospital setting.

After these two searches, we will check reference lists for additional publications (See figure 1 for a flow diagram of the search and selection process).

3. Study selection

Following the second step of our search strategy, two independent researchers will screen abstracts and assess the eligibility for full text retrieval. Selected full-text studies will again be compared between the reviewers with disagreement being resolved through discussion and consensus and with input from the full research team.

The inclusion criteria will be developed in an iterative process in which the reviewers calibrate a threshold for inclusion and exclusion. The initial inclusion criteria will be:

- Original research or reviews in peer reviewed journals that have learning in undergraduate clinical nursing practice in the hospital setting as one of their main topics, regardless of publication date and type of article.
- Studies that include an either original or cited definition and/or operationalization of their concept of using learning in practice.

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Since we are interested in how learning in practice is operationalized in peer-reviewed research, we exclude books, book reviews, commentaries, letters to the editor, PhD theses, and reports. Reasons for exclusion will be documented at the full-text review stage.

4. Charting the data

Data will be extracted from full-text journal articles which meet the aforementioned inclusion criteria. A draft analytic frame is developed to document selected studies into an excel spreadsheet, including study characteristics (year, country, methodology, study question, study design, participants, outcomes, study quality), conceptualization of learning in practice (definitions, theoretical underpinnings/rationale, operationalisations, formal/informal aspects of learning, social interactions, learning opportunities)and reported gaps in the literature. Other categories that come during the data extraction progress will be discussed in the research team and added to the data extraction form. Although formal assessment of study quality is generally not performed in scoping reviews [22], some claim it should be incorporated in the methodology [16]. Assessing study quality will enable us to address not only quantitative, but also qualitative gaps in the literature[21]. We will therefore assess the quality of included studies by a set of quality indicators for reviews developed by Buckley, et al. [24].The form will be piloted on 5–10 articles by the team and will allow us to analyse the selected articles through a common framework.

We will document studies that are not selected for full text retrieval in a separate file. To ensure accurate data collection, each reviewer's independent charted data will be compared and any discrepancies will be iteratively discussed by the researchers to ensure consistency between the reviewers.

5. Collating, summarizing and reporting results

A PRISMA flow diagram will be used to report final numbers in the resulting study publication. We will synthesise our data using narrative descriptions based on themes that emerge after data extraction. The results will be compared and consolidated through consensus between the two reviewers MS and RAK.

This synthesis will include at least a) types of studies b) definitions including underlying theoretical frameworks c) comparison of operationalisations. In our summary of definitions, we will examine the historical trends in the use of certain concepts. In the comparison of operationalisations, specific attention will be paid to formal and informal aspects of learning, social aspects of learning, and learning opportunities. We will address both quantitative and qualitative gaps in the literature. We will discuss the data in the light of relevant theories on workplace learning both in and outside

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nursing education literature and make suggestions for the operationalization of learning in practice for future studies.

6. Expert consultation

In order to confirm our findings and interpretations, two nurse educators, with experience in scientific research and expertise on learning in clinical practice, will be approached for consultation.

ETHICS AND DISSEMINATION

This scoping review will be the first study to compare terminology used for learning in undergraduate nursing clinical practice and thereby will contribute to the design and comparison of future studies in this field. This protocol reports a comprehensive, rigorous and transparent methodology. The results will be disseminated through a peer-reviewed publication and national and international conferences such as the AMEE (Association of Medical Education in Europe) conference, targeting an audience involved in undergraduate nursing education. By identifying gaps in the current body of literature, this study can guide future nursing education research. Both the methodology and the results may be of interest for researchers and educators in other health professions than nursing, given the widely spread importance of learning in clinical practice. Since the methodology applied consists of reviewing and collecting data from publicly available materials, this study does not require an ethical approval.

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AUTHOR STATEMENT

MS and RAK were responsible for the initial design of this study MS, HED, RAK, SP, JCFK, contributed to the development of the eligibility and data extraction criteria JCFK, MS, HED, RAK, developed and executed the search strategy. MS and RAK are responsible for abstract and full-text screening. MS conceptualized the review approach and led the writing of the manuscript. MS, RAK, HED, SP, JCFK contributed and approved the final version of this protocol. RAK led the supervision of the manuscript preparation.

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CONFLICT OF INTERESTS

The authors declare that they have no competing interests.

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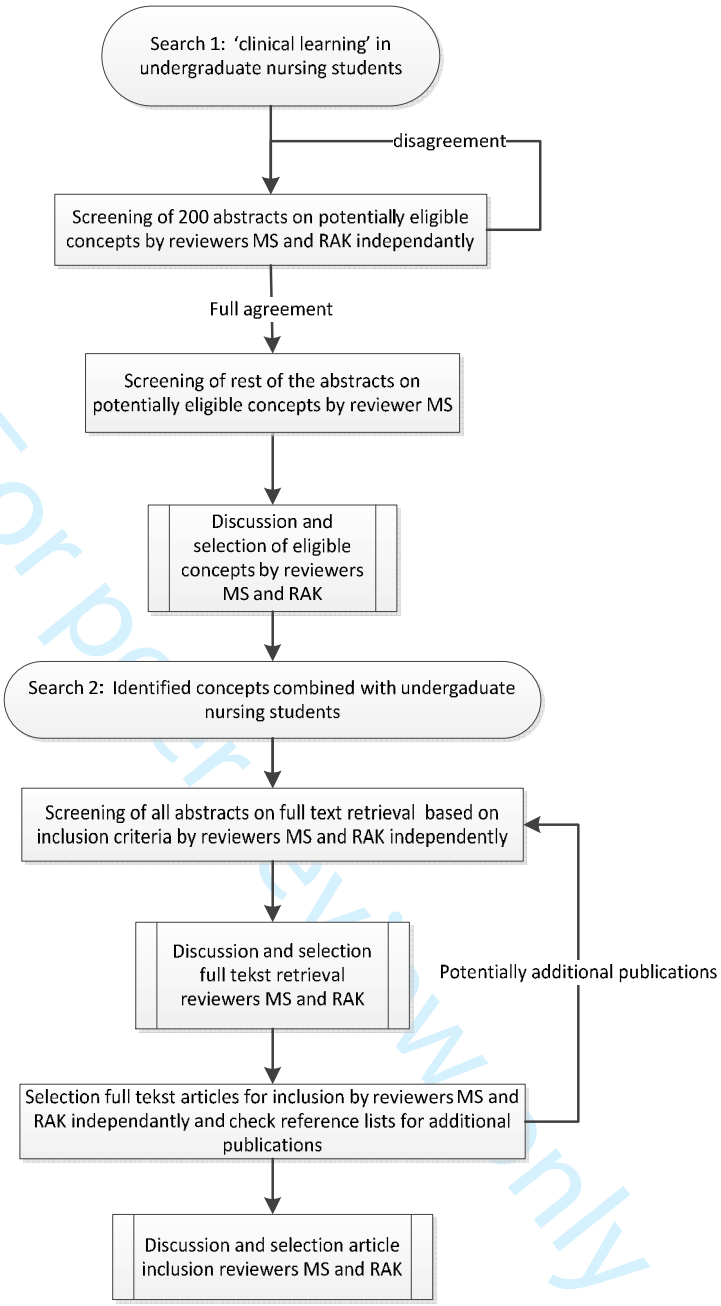

Figure 1. Flow chart of search and study selection process

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PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Pager number(s)
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	Page 1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	Not applicable
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	Not apllicable
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	Page 1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	Page 9
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Not applicable
Support:			
Sources	5a	Indicate sources of financial or other support for the review	Page 9
Sponsor	5b	Provide name for the review funder and/or sponsor	Page 9
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	Page 9
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	Page 3-4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	Page 4
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	Page 5- 6

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Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	Page5-6
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Additional file 1
Study records:			Page 6
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	Page 6
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	Page 7
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	Not applicable
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	Not applicable
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	Not applicable
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	Not applicable
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	Not applicable
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	Not applicable
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	Not applicable
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	Not applicable
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	Not applicable

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

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Additional file 2: Draft search strategy step 1

PubMed 9 May 2018

Search	Query	Items found
#3	("Students, Nursing"[Mesh] OR "Internship, Nonmedical"[Mesh:noexp] OR (nursing[tiab] AND student*[tiab]) OR ((nursing[tiab] OR nurse[tiab] OR nurses[tiab]) AND internship*[tiab])) AND ((("Clinical Competence"[Mesh] OR "Clinical Medicine"[Majr] OR clinical*[ti] OR clinical*[ot] OR practice*[ti] OR practice[ot]) AND ("Learning"[Mesh] OR learning*[tiab])) OR clinical learning*[tiab])	**3586**

Ebsco/ERIC 9 May 2018

#	Query	Results
S7	S1 AND S6	**408**
S6	S4 OR S5	**70,505**
S5	TI ("clinical learning*") OR AB ("clinical learning*")	**84**
S4	S2 AND S3	**70,505**
S3	DE "Learning" OR DE "Active Learning" OR DE "Adult Learning" OR DE "Associative Learning" OR DE "Aural Learning" OR DE "Cooperative Learning" OR DE "Discovery Learning" OR DE "Discrimination Learning" OR DE "Electronic Learning" OR DE "Experiential Learning" OR DE "Incidental Learning" OR DE "Intentional Learning" OR DE "Interference (Learning)" OR DE "Lifelong Learning" OR DE "Mastery Learning" OR DE "Multisensory Learning" OR DE "Nonverbal Learning" OR DE "Observational Learning" OR DE "Prior Learning" OR DE "Problem Based Learning" OR DE "Rote Learning" OR DE "Second Language Learning" OR DE "Sequential Learning" OR DE "Serial Learning" OR DE "Student Centered Learning" OR DE "Symbolic Learning" OR DE "Transfer of Training" OR DE "Transformative Learning" OR DE "Verbal Learning" OR DE "Visual Learning" OR DE "Workplace Learning" OR DE "Active Learning" OR DE "Adult Learning" OR DE "Associative Learning" OR DE "Paired Associate Learning" OR DE "Aural Learning" OR DE "Cooperative Learning" OR DE "Discovery Learning" OR DE "Discrimination Learning" OR DE "Electronic Learning" OR DE "Experiential Learning" OR DE "Field Experience Programs" OR DE "Internship Programs" OR DE "Job Shadowing" OR DE "Service Learning" OR DE "Incidental Learning" OR DE "Intentional Learning" OR DE "Interference (Learning)" OR DE "Lifelong Learning" OR DE "Mastery Learning" OR DE "Multisensory Learning" OR DE "Nonverbal Learning" OR DE "Perceptual Motor Learning" OR DE "Observational Learning" OR DE "Prior Learning" OR DE "Problem Based Learning" OR DE "Rote Learning" OR DE "Second Language Learning" OR DE "Sequential Learning" OR DE "Serial Learning" OR DE "Student Centered Learning" OR DE "Symbolic Learning" OR DE "Transfer of Training" OR DE "Transformative Learning" OR DE "Verbal Learning" OR DE "Visual Learning" OR DE "Workplace Learning" OR TI (learning*) OR AB (learning*)	**381,995**
S2	DE "Clinical Experience" OR TI (clinical* OR practice*) OR AB (clinical* OR practice*)	**205,148**
S1	DE "Nursing Students" OR TI ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*)) OR AB ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*))	**2,294**

Ebsco/CINAHL 9 May 2018

#	Query	Results
S11	S1 AND S10	**3,209**
S10	S5 OR S9	**14,430**
S9	S3 AND S8	**12,924**
S8	MH "Clinical Competence+" OR TI (clinical* OR practice*)	**234,601**
S7	S1 AND S6	**5,669**
S6	S4 OR S5	**32,948**

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S5	MH "Learning Environment, Clinical" OR TI ("clinical learning*") OR AB ("clinical learning*")	**2,388**
S4	S2 AND S3	**31,869**
S3	MH "Learning+" OR MH "Conditioning (Psychology)+" OR MH "Memory+" OR MH "Reinforcement (Psychology)+" OR MH "Problem Solving+" OR TI (learning*) OR AB (learning*)	**103,547**
S2	MH "Clinical Competence+" OR TI (clinical* OR practice*) OR AB (clinical* OR practice*)	**631,184**
S1	MH "Students, Nursing+" OR MH "Students, Nursing, Baccalaureate+" OR MH "Students, Nursing, Graduate+" OR TI ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*)) OR AB ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*))	**35,637**

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BMJ Open

Protocol for a scoping review on the conceptualization of learning in undergraduate clinical nursing practice

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Secondary Subject Heading:	Nursing
Keywords:	MEDICAL EDUCATION & TRAINING, Undergraduate nursing education, Learning in Practice

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Protocol for a scoping review on the conceptualization of learning in undergraduate clinical nursing practice

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Word count

2403

Key words

Undergraduate nursing education, learning in practice

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ABSTRACT

Introduction: Learning in the clinical setting is a major form of learning in undergraduate nursing education. In spite of this, how nursing students learn in clinical practice is still largely unknown. Moreover, there is no conceptual clarity on learning in practice in the current literature. This paper aims to set up a protocol for a scoping review of the literature in order to map different conceptualizations of learning in practice in undergraduate clinical nursing practice in the hospital setting. The operationalizations of different concepts will be compared and the findings of the studies will be synthesized.

Methods and analysis: This scoping review will be guided by the methodological framework proposed by Arksey and O'Malley and refined by Levac et al. and the Joanna Briggs institute. The search strategy will be developed together with a medical information specialist and the search will be performed in electronic databases (PubMed, EBSCO/ERIC and EBSCO/CINAHL). In a first search, we will identify concepts that are used as an equivalent to learning in practice. Next we will search for studies operationalizing these concepts in undergraduate nursing education. Finally, we will check reference lists for additional publications. Abstracts and full-text studies will independently be screened by two researchers. All studies that have 'learning in undergraduate clinical nursing practice' as their main topic and that include a definition of operationalization of an equivalent to learning in clinical practice, will be considered for inclusion. We will chart different conceptualizations and their theoretical underpinnings, as well as reported learning opportunities, informal and formal aspects of learning, social aspects of learning and gaps in the literature.

Ethics and dissemination: This review will help design future studies on learning in clinical nursing practice using well-defined and agreed upon terminology. The results will be disseminated through journal publications and conference presentations.

ARTICLE SUMMARY

Strengths and limitations of this study

- This protocol outlines a rigorous design that includes an established research framework, a search strategy and a selection process.
- The search strategy includes different databases with peer-reviewed literature, with no restrictions to the study design or the publication date.
- The assessment of the quality of the included papers will enable identifying gaps in the literature.

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- A limitation is that the literature search will only cover undergraduate nursing education, while a comparison with literature on learning in practice in other health professions would enrichen our understanding of potential conceptualizations.
- This study will not include books or grey literature, which will allow us to map how learning in practice is conceptualized in original research.

INTRODUCTION

Learning in the clinical setting is crucial for becoming a competent nurse[1]. However, how nursing students learn in clinical practice is still largely unknown. A vast body of knowledge exists on factors that influence learning, but the process itself remains underexposed[2]. For example, there is a lack of insight into how individual learning outcomes can be predicted, or which learning opportunities best promote students' learning. Understanding learning in the clinical setting can help design, supervise and evaluate individual learning trajectories and their outcomes in practice. This study aims to set up a protocol for a scoping review to examine how different concepts that are equivalent to 'learning in practice' are used and operationalized in the literature, and what these studies add to our understanding of learning in the clinical setting

In the educational literature, the concept of 'learning in practice' has been widely studied in the context of workplace learning by professionals[3] or practice learning by students[4]. However, there is no unified definition or approach towards this concept[5]. Two main characteristics of clinical learning can be clearly distinguished in the literature. First, learning in practice is often distinguished from learning in the classroom setting as informal opposed to formal learning, where informal learning arises in situations where learning is not the primary aim[6]. However, some authors question the validity of a dichotomy between formal and informal learning[7], and state that every learning situation contains both formal and informal elements[8]. This would particularly apply to clinical learning, which is characterized by a constant interplay of the 'reality' of clinical practice and formal learning interventions such as feedback and assessment[9]. to identify formal and informal aspects of clinical learning. Another essential characteristic of workplace learning is its social rather than individual nature[10]. That is, learning occurs in interaction and dialogue with others[6].

In the nursing education literature, just as in other health professions education literature, different terms are used to describe and study learning in clinical practice, with different theoretical underpinnings. Moreover, the rationale behind the application of the concepts used is not always explained. Therefore, it is not always clear whether these different terms refer to the same concept, and how they are defined in terms of learning content (skills, knowledge, values), process (implicit,

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explicit), control (intended or unintended, guided or not guided) and learning outcomes. Also, different researchers appear to apply the same concept differently. Having clear and agreed upon terminology can help design future studies that can contribute to understanding learning in clinical practice along with its limitations so that nursing wards can be organized for optimal benefit of the students.

The goal of this scoping review is to provide guidance for the use of concepts that describe learning in undergraduate clinical nursing practice in future studies. This study therefore aims to examine how different concepts that are equivalent to 'learning in practice' are used and operationalized in the literature. Therefore, we will look for studies that examine how learning in the clinical setting takes place. To enable comparison of the use of different concepts, we will focus on the general hospital setting. This context is the traditional setting for nursing training and comprises a variety of factors that may be relevant for learning, such as the presence of registered nurses, peers, and other professionals, as well as complex and acute patients, thereby offering a wide array of multidimensional learning opportunities[11]. We will particularly consider how formal and informal aspects of learning, as well as the social component of learning are included in these operationalisations. We will synthesize the results relating to how students learn in clinical practice.

A body of work on concepts to describe learning in practice does exist outside nursing education literature[12]. To our knowledge, the only study that included distinct concepts of learning in clinical practice in a review before, was a concept analysis of work-based learning in health care education by Manley, et al. [13]. The authors identified common attributes, enabling factors and consequences of workplace learning and proposed a definition. The current review will build on this work by closely examining different concepts of learning in practice in the context of undergraduate nursing education, as well as comparing how they are used to study clinical learning. This will enable us to address gaps in the literature as well as make suggestions for the use of terminology in future studies. Also, the current study will include literature after 2009 when Manley, et al. [13] conducted their study. In interpreting our findings, we will consider the broader body of literature on learning in practice.

METHODS AND ANALYSIS

We decided to use the scoping review approach to map the different concepts that are used to study learning in clinical nursing practice as well as the way they are operationalized and the information they provide about how students learn in the clinical setting Since the lack of a focused line of inquiry requires a broad research question, we consider a scoping review to be more appropriate than a

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systematic review. Scoping can help understand complex concepts through clarifying definitions and conceptual boundaries[14]. Scoping will also enable us to identify key concepts, gaps in the literature, and types and sources of evidence to inform practice, policymaking, and research[15]. To get a comprehensive picture of the existing research, we will include studies with different designs. Since scoping reviews are hypothesis-generating rather than hypothesis-testing, this review can provide a stepping off point for further research.

Standardized reporting guidelines can help the critical appraisal of reviews and thereby increase their reproducibility, completeness, and transparency[16]. For systematic reviews, the PRISMA-P checklist has been developed to facilitate the preparation of a robust research protocol[17]. PRISMA guidelines for scoping reviews are still under development[18]. We therefore used relevant items of the PRISMA-P (Preferred Reporting Items for Systematic Reviews and Meta-analysis Protocols) to draft this protocol, as outlined in additional file 1.

To ensure rigor in reporting the methodology, we will use the six-stage approach developed by Arksey and O'Malley [19] and refined by Levac, et al. [20] and the Joanna Briggs institute [21] (1) identifying the research question; (2) identifying relevant studies; (3) selecting studies; (4) charting the data; (5) collating, summarizing and reporting the results; (6) expert consultation (optional and included).

Stage 1. Identifying the research question

Since our aim is to understand how learning in undergraduate clinical nursing practice is conceptualized in the current literature irrespective of research design and outcome, our research question is:

- How are different concepts that are used as an equivalent to learning in the hospital setting operationalized in the undergraduate nursing education literature?

As scoping is an iterative process[19], we might add additional questions based on our findings along the review process. While the eventual goal of this study is to contribute to the understanding of the process of nursing students' learning in practice, we will also synthesize results that are relevant to this topic.

Stage 2. Identify relevant studies

The search strategy will be iteratively developed by the research team. As suggested by the Joanna Briggs institute[21],we will start with a very broad search to inform our subsequent search strategy. A comprehensive search strategy will be developed (by MS and JCFK) to conduct this stepwise search

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process following the Peer Review of Electronic Search Strategies (PRESS) 2015 guideline statement[22].

In an initial search (search step 1), we will combine the terms 'learning in clinical practice' and 'undergraduate nursing students'. The search query for both steps will first be developed for PubMed and later extended to EBSCO/ERIC and EBSCO/CINAHL to identify different concepts in the literature that are used as an equivalent to 'learning in clinical practice' by nursing students. See our draft search in the additional file 2 for step 1 of our search. The first 100 search results from each database will be reviewed by the researchers to assess validity of the search strategy. When agreement has been reached about the initial search strategy, the first 200 abstracts will be scanned by the two reviewers (MS and RAK) on concepts potentially eligible for inclusion in the second search step. Eligible concepts are concepts that describe the process of learning to become a nurse within the clinical context ('such as 'experiential learning' or 'informal learning'), rather than specific aspects or (such as 'skill acquisition' or 'peer learning'). In case of full agreement between the two reviewers on potentially eligible concepts, the first reviewer will screen the rest of the abstracts. In case of disagreement, the second author will scan another 200 abstracts until full agreement is reached. After all abstracts have been screened, the two reviewers will discuss all potentially eligible concepts and select concepts to be included in the second search step.

After having selected the different concepts, we will develop a search query (search step 2) in PubMed and subsequently extend to EBSCO/ERIC and EBSCO/CINAHL combining each of the identified concepts with 'undergraduate nursing' to find studies operationalizing one of the identified concepts in the literature on nursing students' learning in the hospital setting.

After these two searches, we will check reference lists for additional publications (See figure 1 for a flow diagram of the search and selection process). We will conduct the two searches in June 2018.

Stage 3. Study selection

Following the second step of our search strategy, two independent researchers will screen abstracts and assess the eligibility for full text retrieval. Selected full-text studies will again be compared between the reviewers with disagreement being resolved through discussion and consensus and with input from the full research team.

The inclusion criteria will be developed in an iterative process in which the reviewers calibrate a threshold for inclusion and exclusion. The initial inclusion criteria will be:

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- Original research or reviews in peer reviewed journals that have learning in undergraduate clinical nursing practice in the hospital setting as one of their main topics, regardless of publication date and type of article.
- Studies that examine how students learn in the clinical hospital setting

Since we are interested in how learning in practice is operationalized in peer-reviewed research, we exclude books, book reviews, commentaries, letters to the editor, PhD theses, and reports. Reasons for exclusion will be documented at the full-text review stage.

Stage 4. Charting the data

Data will be extracted from full-text journal articles which meet the aforementioned inclusion criteria. A draft analytic frame is developed to document selected studies into an excel spreadsheet, including study characteristics (year, country, methodology, study question, study design, participants, outcomes, study quality), conceptualization of learning in practice (definitions, theoretical underpinnings/rationale, operationalisations, formal/informal aspects of learning, social interactions, learning opportunities)and reported gaps in the literature. Other categories that come during the data extraction progress will be discussed in the research team and added to the data extraction form. Although formal assessment of study quality is generally not performed in scoping reviews[21], some claim it should be incorporated in the methodology[15]. Assessing study quality will enable us to address not only quantitative, but also qualitative gaps in the literature[20]. We will therefore assess the quality of included studies by a set of quality indicators for reviews developed by Buckley, et al. [23].The form will be piloted on 5–10 articles by the team and will allow us to analyse the selected articles through a common framework.

We will document studies that are not selected for full text retrieval in a separate file. To ensure accurate data collection, each reviewer's independent charted data will be compared and any discrepancies will be iteratively discussed by the researchers to ensure consistency between the reviewers.

Stage 5. Collating, summarizing and reporting results

A PRISMA flow diagram will be used to report final numbers in the resulting study publication. As we expect a diverse body of knowledge, we will give a descriptive account of concepts and subsequent operationalizations. We will synthesise study findings using narrative descriptions based on themes that emerge from the extracted data. The results will be compared and consolidated through consensus between two of the r MS and RAK.

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We will address both quantitative and qualitative gaps in the literature. We will discuss the data in the light of relevant theories on workplace learning both in and outside nursing education literature and make suggestions for the operationalization of learning in practice for future studies.

Stage 6. Expert consultation

In order to confirm our findings and interpretations, two nurse educators, with experience in scientific research and expertise on learning in clinical practice, will be approached for consultation.

ETHICS AND DISSEMINATION

This scoping review will be the first study to compare terminology used for learning in undergraduate nursing clinical practice and thereby will contribute to the design and comparison of future studies in this field. This protocol reports a comprehensive, rigorous and transparent methodology. The results will be disseminated through a peer-reviewed publication and national and international conferences such as the AMEE (Association of Medical Education in Europe) conference, targeting an audience involved in undergraduate nursing education. By identifying gaps in the current body of literature, this study can guide future nursing education research. Both the methodology and the results may be of interest for researchers and educators in other health professions than nursing, given the widely spread importance of learning in clinical practice. Since the methodology applied consists of reviewing and collecting data from publicly available materials, this study does not require an ethical approval.

PATIENT AND PUBLIC INVOLVEMENT

As education is essential for improving patient care, patients will eventually benefit from the body of knowledge this study contributes to. However, specific interests of patients have not been examined. Patients have not been involved in the design nor the conduct of the study. As this concerns a review, this study has no participants.

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AUTHOR STATEMENT

MS and RAK were responsible for the initial design of this study MS, HED, RAK, SP, JCFK, contributed to the development of the eligibility and data extraction criteria JCFK, MS, HED, RAK, developed and executed the search strategy. MS and RAK are responsible for abstract and full-text screening. MS conceptualized the review approach and led the writing of the manuscript. MS, RAK, HED, SP, JCFK contributed and approved the final version of this protocol. RAK led the supervision of the manuscript preparation.

FUNDING

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CONFLICT OF INTERESTS

The authors declare that they have no competing interests.

FIGURES

Figure 1. Flow diagram of search and study selection process

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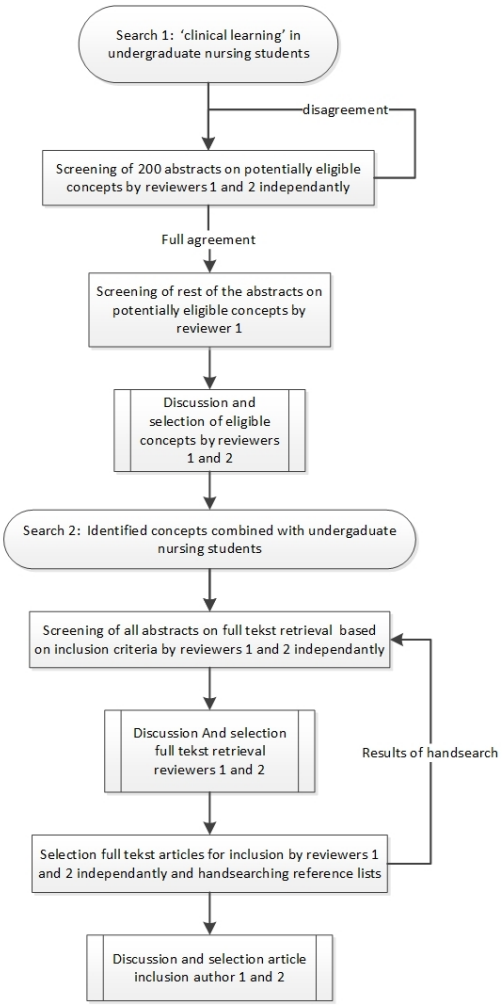

Figure 1. Flow diagram of search and study selection process

90x90mm (300 x 300 DPI)

PRISMA-P (Preferred Reporting Items for Systematic review and Meta-Analysis Protocols) 2015 checklist: recommended items to address in a systematic review protocol*

Section and topic	Item No	Checklist item	Pager number(s)
ADMINISTRATIVE INFORMATION			
Title:			
Identification	1a	Identify the report as a protocol of a systematic review	Page 1
Update	1b	If the protocol is for an update of a previous systematic review, identify as such	Not applicable
Registration	2	If registered, provide the name of the registry (such as PROSPERO) and registration number	Not apllicable
Authors:			
Contact	3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author	Page 1
Contributions	3b	Describe contributions of protocol authors and identify the guarantor of the review	Page 9
Amendments	4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments	Not applicable
Support:			
Sources	5a	Indicate sources of financial or other support for the review	Page 9
Sponsor	5b	Provide name for the review funder and/or sponsor	Page 9
Role of sponsor or funder	5c	Describe roles of funder(s), sponsor(s), and/or institution(s), if any, in developing the protocol	Page 9
INTRODUCTION			
Rationale	6	Describe the rationale for the review in the context of what is already known	Page 3-4
Objectives	7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	Page 4
METHODS			
Eligibility criteria	8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	Page 5- 6

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Information sources	9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	Page5-6
Search strategy	10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	Additional file 1
Study records:			Page 6
Data management	11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	
Selection process	11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	Page 6
Data collection process	11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	Page 7
Data items	12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	Not applicable
Outcomes and prioritization	13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	Not applicable
Risk of bias in individual studies	14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	Not applicable
Data synthesis	15a	Describe criteria under which study data will be quantitatively synthesised	Not applicable
	15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I^2, Kendall's τ)	Not applicable
	15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	Not applicable
	15d	If quantitative synthesis is not appropriate, describe the type of summary planned	Not applicable
Meta-bias(es)	16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	Not applicable
Confidence in cumulative evidence	17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	Not applicable

*** It is strongly recommended that this checklist be read in conjunction with the PRISMA-P Explanation and Elaboration (cite when available) for important clarification on the items. Amendments to a review protocol should be tracked and dated. The copyright for PRISMA-P (including checklist) is held by the PRISMA-P Group and is distributed under a Creative Commons Attribution Licence 4.0.**

From: Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

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Additional file 2: Draft search strategy step 1

PubMed 9 May 2018

Search	Query	Items found
#3	("Students, Nursing"[Mesh] OR "Internship, Nonmedical"[Mesh:noexp] OR (nursing[tiab] AND student*[tiab]) OR ((nursing[tiab] OR nurse[tiab] OR nurses[tiab]) AND internship*[tiab])) AND ((("Clinical Competence"[Mesh] OR "Clinical Medicine"[Majr] OR clinical*[ti] OR clinical*[ot] OR practice*[ti] OR practice[ot]) AND ("Learning"[Mesh] OR learning*[tiab])) OR clinical learning*[tiab])	3586

Ebsco/ERIC 9 May 2018

#	Query	Results
S7	S1 AND S6	408
S6	S4 OR S5	70,505
S5	TI ("clinical learning*") OR AB ("clinical learning*")	84
S4	S2 AND S3	70,505
S3	DE "Learning" OR DE "Active Learning" OR DE "Adult Learning" OR DE "Associative Learning" OR DE "Aural Learning" OR DE "Cooperative Learning" OR DE "Discovery Learning" OR DE "Discrimination Learning" OR DE "Electronic Learning" OR DE "Experiential Learning" OR DE "Incidental Learning" OR DE "Intentional Learning" OR DE "Interference (Learning)" OR DE "Lifelong Learning" OR DE "Mastery Learning" OR DE "Multisensory Learning" OR DE "Nonverbal Learning" OR DE "Observational Learning" OR DE "Prior Learning" OR DE "Problem Based Learning" OR DE "Rote Learning" OR DE "Second Language Learning" OR DE "Sequential Learning" OR DE "Serial Learning" OR DE "Student Centered Learning" OR DE "Symbolic Learning" OR DE "Transfer of Training" OR DE "Transformative Learning" OR DE "Verbal Learning" OR DE "Visual Learning" OR DE "Workplace Learning" OR DE "Active Learning" OR DE "Adult Learning" OR DE "Associative Learning" OR DE "Paired Associate Learning" OR DE "Aural Learning" OR DE "Cooperative Learning" OR DE "Discovery Learning" OR DE "Discrimination Learning" OR DE "Electronic Learning" OR DE "Experiential Learning" OR DE "Field Experience Programs" OR DE "Internship Programs" OR DE "Job Shadowing" OR DE "Service Learning" OR DE "Incidental Learning" OR DE "Intentional Learning" OR DE "Interference (Learning)" OR DE "Lifelong Learning" OR DE "Mastery Learning" OR DE "Multisensory Learning" OR DE "Nonverbal Learning" OR DE "Perceptual Motor Learning" OR DE "Observational Learning" OR DE "Prior Learning" OR DE "Problem Based Learning" OR DE "Rote Learning" OR DE "Second Language Learning" OR DE "Sequential Learning" OR DE "Serial Learning" OR DE "Student Centered Learning" OR DE "Symbolic Learning" OR DE "Transfer of Training" OR DE "Transformative Learning" OR DE "Verbal Learning" OR DE "Visual Learning" OR DE "Workplace Learning" OR TI (learning*) OR AB (learning*)	381,995
S2	DE "Clinical Experience" OR TI (clinical* OR practice*) OR AB (clinical* OR practice*)	205,148
S1	DE "Nursing Students" OR TI ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*)) OR AB ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*))	2,294

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#	Query	Results
S11	S1 AND S10	3,209
S10	S5 OR S9	14,430
S9	S3 AND S8	12,924
S8	MH "Clinical Competence+" OR TI (clinical* OR practice*)	234,601
S7	S1 AND S6	5,669
S6	S4 OR S5	32,948

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S5	MH "Learning Environment, Clinical" OR TI ("clinical learning*") OR AB ("clinical learning*")	**2,388**
S4	S2 AND S3	**31,869**
S3	MH "Learning+" OR MH "Conditioning (Psychology)+" OR MH "Memory+" OR MH "Reinforcement (Psychology)+" OR MH "Problem Solving+" OR TI (learning*) OR AB (learning*)	**103,547**
S2	MH "Clinical Competence+" OR TI (clinical* OR practice*) OR AB (clinical* OR practice*)	**631,184**
S1	MH "Students, Nursing+" OR MH "Students, Nursing, Baccalaureate+" OR MH "Students, Nursing, Graduate+" OR TI ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*)) OR AB ((nursing N3 student*) OR ((nursing OR nurse OR nurses) N3 internship*))	**35,637**

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