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# Interventions to improve patient health education competence among nursing personnel: A scoping review protocol

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1	Interventions to improve patient health education competence among nursing
2	personnel: A scoping review protocol
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16	Email address: wsy251941@csu.edu.cn
17	Keywords: Patient education; Health education; Nurse; Competence; Nursing
18	Education
19	Word count: 2745
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21 ABSTRACT

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1	Introduction Patient health education has gradually become an indispensable and
2	important part of nursing work. However, nursing personnel's performance in this
3	domain remains below satisfactory levels. The absence of patient health education
4	competence constitutes a significant impediment to the effective implementation of
5	such education by nursing personnel. Effective training in patient health education
6	competence can enable nursing personnel to recognize the importance of patient health
7	education, improve their attitudes toward patient health education, and gain
8	comprehensive knowledge and skills, thus improving patients' health outcomes and
9	quality of life, while also enhancing the overall quality of nursing. However, the related
10	research is fragmented and there is a lack of systematic review of related literature. The
11	scoping review aims to provide a comprehensive overview of existing interventions
12	related to cultivating the patient health education competence of nursing personnel.
13	Methods and analysis We will use the Joanna Briggs Institute (JBI) methodology to
14	guide the scoping review proposed by this protocol. Between April 1, 2024, and April
15	15, 2024, a systematic search of electronic bibliographic databases, including Cochrane
16	Library, PubMed, EMBASE, CINAHL, MEDLINE, and ERIC, will be conducted. Two
17	reviewers will independently screen and conduct data extraction. Any discrepancies

19 analyzed and presented in tables, flow diagrams, and text.

that arise will be resolved through consultation with a third reviewer. The data will be

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4 5	1	Ethics and dissemination Ethical approval is not applicable for this study. We will
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7	2	share the findings from the study at national and/or international conferences and in a
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9	3	peer-reviewed journal in the fields of nursing education and/or patient education.
10	0	peer reviewen journar in the nords of naising endeation and of patient endeation.
11 12	4	
13	4	Registration number This scoping review had been registered on Open Science
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15	5	Framework (http://osf.io/dapq7).
16		
17	6	Strengths and limitations of this study
18 10	0	Strengths and miniations of tins study
19 20	_	
21	7	> The Preferred Reporting Items for Systematic Reviews and Meta-Analyses
22		
23	8	extension for Scoping Reviews (PRISMA-ScR) checklist will be used to guide the
24		
25	9	reporting of the scoping review.
26 27	3	reporting of the scoping review.
28		
29	10	The review proposed by this protocol will follow the Joanna Briggs Institute (JBI)
30		
31	11	methodology for scoping reviews.
32		
33 34	12	The seening review may fail to include relevant literature published outside of the
34 35	12	> The scoping review may fail to include relevant literature published outside of the
36		
37	13	searched databases.
38		
39	14	1. INTRODUCTION
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41 42	15	With the transformation of the disease contered are model to the nations contered
43	15	With the transformation of the disease-centered care model to the patient-centered
44		
45	16	holistic care model, patient health education has gradually become an indispensable
46		
47	17	and important part of nursing work. <sup>12</sup> Patient health education is a planned educational
48 49		
49 50	10	measure designed to immediat notions habevies and regult in showers in Imperiades
51	18	process designed to impact patient behavior and result in changes in knowledge,
52		
53	19	attitudes, and skills that are necessary for maintaining or improving health. <sup>3</sup> A series of
54 55		
55 56	20	studies have demonstrated that effective patient health education can enhance patients'
50 57		r r r r r r r r r r r r r r r r r r r
58	21	comprohension of their own health status and macquires for disease management. It has
59	41	comprehension of their own health status and measures for disease management. It has
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been shown to improve their health literacy, alleviate anxiety, and foster increased compliance and satisfaction with nursing personnel. Thus, it improves patients' health outcomes and quality of life, while also enhancing the overall quality of nursing.<sup>2 4-8</sup> Moreover, patient health education emerges as a cost-effective measure, offering potential savings in healthcare costs and alleviating the overall economic burden on society.<sup>9</sup> A specific study demonstrated noteworthy cost-effectiveness, indicating that for each USD 1 invested in patient health education services, there was a remarkable saving of USD 6 in healthcare costs.<sup>2</sup> While nursing personnel acknowledge the pivotal role of patient health education in their clinical practice, their performance in this domain remains below satisfactory levels.<sup>9-11</sup> Numerous studies consistently indicate that the absence of patient health education competence (PHEC) constitutes a significant impediment to the effective implementation of such education by nursing personnel.<sup>2 9-11</sup> Effective training in PHEC can enable nursing personnel to recognize the importance of patient health education, improve their attitudes toward patient health education, and gain

Hence, it is imperative to enhance the PHEC of nurses and nursing students through
training, as this is crucial for improving their skills and fostering the development of
patient health education.

comprehensive knowledge and skills, thus promoting the development of PHEC.<sup>12-14</sup>

Although studies have documented interventions aimed at enhancing the PHEC of
 nursing personnel, a comprehensive review of these interventions has not been

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1	conducted at present. <sup>13-18</sup> It is unknown what types of interventions exist, what content
2	and pedagogical methods are covered, and how interventions may improve nursing
3	personnel's PHEC. Through systematic combing and analysis of the existing literature,
4	we can develop a comprehensive framework that provides insights into the
5	characteristics, strategies, and suitability of various interventions. This aids in
6	identifying gaps and informing the development of future interventions to develop
7	high-quality and effective evidence-based related training. Consequently, there is a
8	pressing need for systematic analysis and integration of existing interventions to
9	maximize their effectiveness, thereby providing a basis for constructing more effective
10	interventions in the future. Furthermore, the existing literature is fragmented. Therefore,
11	we propose the adoption of a scoping review to address this knowledge gap and gather
12	dispersed information. The scoping review aims to provide a comprehensive overview
13	of existing interventions related to cultivating the PHEC of nursing personnel. It intends
14	to provide up-to-date, evidence-based recommendations related to the training of
15	nursing personnel's PHEC for future researchers, intervention designers, and
16	educational policy makers.

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- **Review question**
- (1) What are the characteristics (e.g., year, country, study design) of the studies on
  interventions aimed at improving the PHEC of nursing personnel?
- 20 (2) What intervention strategies (e.g., teaching modalities, teaching objectives,
  21 teaching content, teaching methods, teaching duration and frequency, teaching media,

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1	and teaching faculty) are being used for the interventions aimed at improving the PHEC
2	of nursing personnel?
3	(3) What are the outcomes measured and what assessment methods (e.g., quizzes,
4	interviews) are used to measure outcomes?
5	2. METHODS
6	We will use the Joanna Briggs Institute (JBI) methodology to guide the scoping
7	review proposed by this protocol. <sup>19</sup> The scoping review will be reported following the
8	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for
9	Scoping Reviews (PRISMA-ScR) checklist. <sup>20</sup> This scoping review had been registered
10	on Open Science Framework ( <u>http://osf.io/dapq7</u> ).
11	Search strategy
12	Between April 1, 2024, and April 15, 2024, a systematic search of electronic
13	bibliographic databases, including Cochrane Library, PubMed, EMBASE, CINAHL,
14	MEDLINE, and ERIC, will be conducted. The search time limit will span from the
15	creation date of the respective libraries to the search date. Furthermore, references of
16	included studies will be thoroughly searched to identify any additional eligible studies.
17	The literature search will employ a combination of subject terms and free words to
18	ensure comprehensive coverage. The search terms related to nursing, patient education,
19	competence, and training will be used. The search strategy tailored for PubMed is
20	presented in Table 1, while the corresponding search strategies for other databases can
21	be found in Supplementary file 1. A three-step search strategy will be employed: (1)

Initially, the researchers will conduct a limited search in PubMed and Embase to analyze the MeSH terms and keywords found in the titles and abstracts. (2) Subsequently, a comprehensive search will be carried out across all target databases, using the search terms identified in the first step. (3) Finally, the researchers will explore the reference lists of all identified articles to identify additional relevant studies.

6 Table 1. Search strategy for PubMed

1	#1	(Nurses[MeSH Terms] OR Students, Nursing[MeSH Terms]) OR	
		(nurs*[tiab] OR nursing student*[tiab])	
2	#2	(((Health Education[MeSH Terms] OR Patient Education as	
		Topic[MeSH Terms]) OR (health education[tiab] OR education,	
		health[tiab] OR patient education[tiab] OR education, patient*[tiab]	
		OR education of patient*[tiab] OR patient teaching[tiab] OR patient	
		training[tiab])) OR (hospital education[tiab] OR clinical	
		education[tiab])) OR (((((("educate individual"[tiab:~2]) OR	
		("inform individual"[tiab:~2])) OR ("teach individual"[tiab:~2])) OR	
		("train individual"[tiab:~2])) OR ("learn individual"[tiab:~2])) OR	
	((((("educate consumer"[tiab:~2]) OR ("inform consumer"[tiab		
		OR ("teach consumer"[tiab:~2])) OR ("train consumer"[tiab:~2]))	
		("learn consumer"[tiab:~2]))) OR ((("educate patient"[tiab:~2]) OR	
		("inform patient"[tiab:~2])) OR (((("teach patient"[tiab:~2]) OR ("tra	
		patient"[tiab:~2])) OR ("learn patient"[tiab:~2]))))	
3	#3	((professional competence[MeSH Terms]) OR (competenc*[tiab] OR	
		capabilit*[tiab] OR capacit*[tiab] OR abilit*[tiab])) OR	
		((knowledge[tiab]) AND (skill*[tiab]))	

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4	#4	(education,	nursing[MeSH	Terms]	OR	nursing	educa	tion
		research[Mes	SH Terms] OR E	lucation, N	ursing,	Baccalaur	eate[Me	eSH
		Terms] OR	Education, Nu	rsing, Con	tinuing	g[MeSH 7	[erms]	OR
		curriculum[N	AeSH Terms]) C	OR (educat	*[tiab]	OR teach	*[tiab]	OR
		learn*[tiab]	OR course*[tiab	] OR class	s*[tiab]	OR train	*[tiab]	OR
		lecture*[tiab]	] OR intervene*[t	iab] OR wo	orkshoj	p[tiab])		
5	#5	#1 AND #2 /	AND #3 AND #4					

## 1 Inclusion and exclusion criteria

The PCC (Population, Concept, Context) model will guide the development of
inclusion and exclusion criteria.
Population: Any nursing personnel (e.g., clinical nurses, nursing supervisors,
nurse managers, and nursing students) in any clinical setting (e.g., hospital, community)
are eligible. The literature will also be considered if the intervention is aimed at health
professionals but includes nursing personnel, with at least half of the participants being
nursing personnel.

9 Concept: Any intervention designed to improve nursing personnel's PHEC. Any
10 intervention content, intervention method, and intervention duration will be included as
11 concepts.

Context: Interventions provided in any setting by professional or non-professional
 providers will be considered.

Literature type: This review will consider different research methods (e.g.,
 quantitative, qualitative, and mixed methods study designs) for inclusion. Protocols,

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1 conference abstracts, and reviews will be excluded. If full-text versions of the studies 2 are not available online, we will contact the authors of these articles, and if we are 3 unable to obtain valid information after contacting the authors, we will exclude these 4 articles. No limitation is on publication time and language.

5 Study selection

We will manage study selection through Endnote. The selection will consist of two steps, conducted by two independent reviewers who will adhere to pre-specified eligibility criteria. In the first step of the screening process, titles and abstracts will be reviewed by two independent researchers according to the established eligibility criteria. Any discrepancies that arise will be resolved through consultation with a third reviewer. The second step will entail a full-text review of the studies that pass the first step, conducted by the same independent reviewers. In the event of a disagreement, a third researcher will be consulted to assist with the literature screening. The results of the review will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.<sup>21</sup> Because this scoping review aims to provide a mapping of the available evidence rather than to offer a comprehensive, clinically meaningful answer to a specific question, we will not conduct risk of bias assessments or quality assessments for the included studies. The screening processes of this study are shown in Figure 1.

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20 Data extraction

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1	Two reviewers will conduct data extraction from the included studies	
2	independently, using the data extraction table. The data extraction table is shown in	
3	Supplementary file 2. In case of any discrepancies or disagreements, a third reviewer	
4	will be consulted to resolve them through discussion. The data to be extracted will	
5	include: (1) characteristics of all included studies (i.e., author, year of publication,	
6	country, type of study/design); (2) participants (i.e., target population, sample size,	
7	study setting); (3) study aims; (4) intervention strategies (i.e., teaching modalities,	
8	teaching objectives, teaching content, teaching methods, teaching duration and	
9	frequency, teaching media, and teaching faculty); (5) outcomes measured; (6) outcome	
10	assessment methods and measurement instruments; (7) key findings and conclusions.	
11	Synthesis and presentation of the results	
12	In accordance with the study objectives of this scoping review, we aim to offer a	
13	narrative description of the data, supplemented by the utilization of tables and flow	
14	diagrams to enhance the visual representation of our findings.	
15	Patient and public involvement	
16	Neither patients nor the public will be involved in this study.	
17	Ethics and dissemination	
18	Ethical approval is not applicable for this study. We will share the findings from	
19	the study at national and/or international conferences and in a peer-reviewed journal in	

- 20 the fields of nursing education and/or patient education.
  - 21 **3. DISCUSSION**

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1	In this scoping review, the available evidence and innovative practices on the topic
2	of the interventions to improve nursing personnel's PHEC will be identified and
3	mapped. The findings from this study will contribute to the development of more
4	effective intervention programs aimed at enhancing nursing personnel's PHEC. By
5	synthesizing the evidence, research gaps in the existing literature will be recognized.
6	Researchers can conduct specific and high-quality studies to bridge the gaps to provide
7	more evidence to develop related interventions.
8	
9	Author contributions All authors have read and agreed to the published version of the
10	manuscript.
11	Conceptualization: GW, QC, ST;
12	Methodology: QC, SW, GW;
13	Data curation: QC, SW, KL, YQ;
14	Writing—original draft preparation: SW, GW, LK;
15	Writing—review and editing: QC, ST, YQ;
16	Supervision: QC and ST.
17	Funding This work was supported by the National Natural Science Foundation of
18	China (No. 72104250) and the Natural Science Foundation of Hunan Province (No.
19	2022JJ40642).
20	Competing interests None declared.
21	Patient consent Not required.

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1	Data sharing statement No additional data available.
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3	List of Figures:
4	Figure 1. PRISMA flow diagram for this systematic review
5	List of Tables:
6	Table 1. Search strategy for PubMed
7	List of Supplementary File Tables:
8	Supplementary file 1. Search strategy for other databases
9	Table S1. Search strategy for Cochrane Library
10	Table S2. Search strategy for Embase
11	Table S3. Search strategy for Medline
12	Table S4. Search strategy for CINAHL
13	Table S5. Search strategy for ERIC
14	Supplementary file 2. Data extraction table
15	Table S1. The characteristics of included studies
16	Table S2. The extra characteristics of included studies
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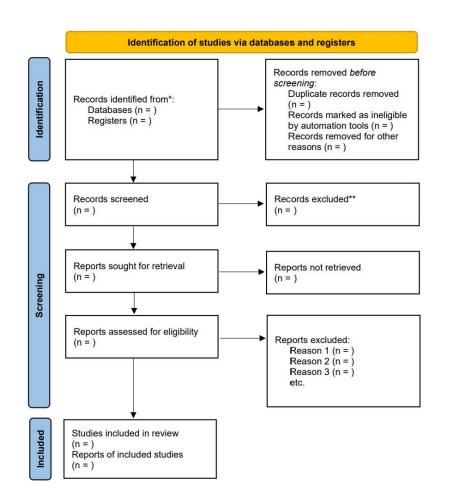
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12 13 14 15	<ul> <li>skills and personal attributes for competent health education practice: An instrument development and psychometric validation study. <i>J Adv Nurs</i> 2021;77(2):715-28. doi: 10.1111/jan.14632 [published Online First: 20201127]</li> <li>12. Weiss ME, Piacentine LB, Candela L, et al. Effectiveness of using a simulation</li> </ul>
12 13 14 15 16	<ul> <li>skills and personal attributes for competent health education practice: An instrument development and psychometric validation study. J Adv Nurs 2021;77(2):715-28. doi: 10.1111/jan.14632 [published Online First: 20201127]</li> <li>12. Weiss ME, Piacentine LB, Candela L, et al. Effectiveness of using a simulation combined with online learning approach to develop discharge teaching skills.</li> </ul>
12 13 14 15 16 17	<ul> <li>skills and personal attributes for competent health education practice: An instrument development and psychometric validation study. J Adv Nurs 2021;77(2):715-28. doi: 10.1111/jan.14632 [published Online First: 20201127]</li> <li>12. Weiss ME, Piacentine LB, Candela L, et al. Effectiveness of using a simulation combined with online learning approach to develop discharge teaching skills. Nurse Educ Pract 2021;52:103024. doi: 10.1016/j.nepr.2021.103024</li> </ul>

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\*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).

\*\*If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

Figure 1. PRISMA flow diagram for this systematic review

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# Table S1. Search strategy for Cochrane Library

1	#1	MeSH descriptor: [Nurses] this term only OR MeSH descriptor:
		[Students, Nursing] this term only OR (nurs* OR nursing
		student*):ti,ab,kw
2	#2	MeSH descriptor: [Health Education] this term only OR MeSH
		descriptor: [Patient Education as Topic] this term only OR (health
		education OR education, health OR patient education OR education,
		patient* OR education of patient* OR patient teaching OR patient
		training OR hospital education OR clinical education):ti,ab,kw OR
		((educat* OR inform* OR teach* OR train* OR learn*):ti,ab,kw
		NEAR/2 (health OR patient* OR consumer* OR
		individual*):ti,ab,kw)
3	#3	MeSH descriptor: [Professional Competence] this term only OR
		(competenc* OR capabilit* OR capacit* OR abilit*):ti,ab,kw OR
		((knowledge):ti,ab,kw NEAR/2 (skill*):ti,ab,kw)
4	#4	MeSH descriptor: [Education, Nursing] this term only OR MeSH
		descriptor: [Nursing Education Research] this term only OR MeSH
		descriptor: [Education, Nursing, Baccalaureate] this term only OR
		MeSH descriptor: [Education, Nursing, Continuing] this term only OR
		MeSH descriptor: [Curriculum] this term only OR (educat* OR teach*
		OR learn* OR course* OR class* OR train* OR lecture* OR
		intervene* OR workshop):ti,ab,kw
5	#5	#1 AND #2 AND #3 AND #4

# Table S2. Search strategy for Embase

1	#1	'nurse'/mj OR 'nursing student'/mj OR nurs*:ab,ti OR 'nursing
		student*':ab,ti
2	#2	('health education'/mj OR 'patient education'/mj OR 'health
		education':ab,ti OR 'education, health':ab,ti OR 'patient education':ab,ti
		OR 'education, patient*':ab,ti OR 'education of patient*':ab,ti OR '
		patient teaching ':ab,ti OR 'patient training':ab,ti OR 'hospital
		education':ab,ti OR 'clinical education':ab,ti) OR ((educat* OR
		inform* OR teach* OR train* OR learn*) NEXT/1 (health OR patient*
		OR consumer* OR individual*))
3	#3	'professional competence'/mj OR competenc*:ab,ti OR
		'competence'/mj OR 'competency'/mj OR 'competencies'/mj OR
		capabilit*:ab,ti OR 'capacitance'/mj OR 'capacity'/mj OR abilit*:ab,ti
		OR (knowledge:ab,ti AND skill*:ab,ti)
4	#4	'nursing education'/mj OR educat*:ab,ti OR teach*:ab,ti OR
		'curriculum'/mj OR learn*:ab,ti OR course*:ab,ti OR class*:ab,ti OR
		train*:ab,ti OR lecture*:ab,ti
5	#5	#1 AND #2 AND #3 AND #4

# Table S3. Search strategy for Medline

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1	#1	The search strategy of #1 is the same as that in Embase.
2	#2	The search strategy of #2 is the same as that in Embase.
3	#3	The search strategy of #3 is the same as that in Embase.
4	#4	The search strategy of #4 is the same as that in Embase.
5	#5	The search strategy of #5 is the same as that in Embase.

# Table S4. Search strategy for CINAHL

Nursing student*)(MM "Health Education") OR (MM " Patient Education") OR TI(health education OR education, health OR patient education OReducation, patient* OR education of patient* OR patient teaching ORpatient training OR hospital education OR clinical education) OR (AB(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (healthOR patient* OR consumer* OR individual*))(MM "Professional Competence") OR AB (competence* OR capabilit*
<ul> <li>(health education OR education, health OR patient education OR education, patient* OR education of patient* OR patient teaching OR patient training OR hospital education OR clinical education) OR (AB (educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*))</li> <li>(MM "Professional Competence") OR AB (competenc* OR capabilit*</li> </ul>
education, patient* OR education of patient* OR patient teaching OR patient training OR hospital education OR clinical education) OR (AB (educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*)) (MM "Professional Competence") OR AB (competenc* OR capabilit*
<ul> <li>patient training OR hospital education OR clinical education) OR (AB (educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*))</li> <li>(MM "Professional Competence") OR AB (competenc* OR capabilit*</li> </ul>
<ul> <li>(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*))</li> <li>(MM "Professional Competence") OR AB (competenc* OR capabilit*</li> </ul>
OR patient* OR consumer* OR individual*)) (MM "Professional Competence") OR AB (competenc* OR capabilit*
(MM "Professional Competence") OR AB (competenc* OR capabilit*
OR capacit* OR abilit*) OR AB (Knowledge N1 skill*)
(MM "Education, Nursing") OR (MM "Curriculum") OR AB (educat*
OR teach* OR learn* OR course* OR class* OR train* OR lecture*
OR intervene* OR workshop)
#1 AND #2 AND #3 AND #4

# Table S5. Search strategy for ERIC

4		
1	#1	(DE "Nurses") OR (DE "Students, Nursing") OR AB (nurs* OR
		Nursing student*)
2	#2	(DE "Health Education") OR (DE "Patient Education") OR AB (health
		education OR education, health OR patient education OR education,
		patient* OR education of patient* OR patient teaching OR patient
		training OR hospital education OR clinical education) OR (AB
		(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health
		OR patient* OR consumer* OR individual*))
3	#3	(DE "Professional Competence") OR AB (competenc* OR capabilit*
		OR capacit* OR abilit*) OR AB (Knowledge N1 skill*)
4	#4	(DE "Education, Nursing") OR (DE "Curriculum") OR AB (educat*
		OR teach* OR learn* OR course* OR class* OR train* OR lecture*
		OR intervene* OR workshop)
5	#5	#1 AND #2 AND #3 AND #4

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# Interventions to improve patient health education competence among nursing personnel: A scoping review protocol

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<b>Primary Subject Heading</b> :	Nursing
Secondary Subject Heading:	Medical education and training
Keywords:	Health Education, Nurses, EDUCATION & TRAINING (see Medical Education & Training)

# SCHOLARONE<sup>™</sup> Manuscripts

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1	Interventions to improve patient health education competence among nursing
2	personnel: A scoping review protocol
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3 Keywords: Patient education; Health education; Nurse; Professional competence;

- 4 Nursing Education
- 5 **Word count: 2710**
- 6

7

ABSTRACT

Introduction Patient health education has gradually become an indispensable and 8 9 important part of nursing work. However, nursing personnel's performance in this domain remains below satisfactory levels. The absence of patient health education 10 competence constitutes a significant impediment to the effective implementation of 11 12such education by nursing personnel. Effective training in patient health education 13competence can enable nursing personnel to recognize the importance of patient health 14 education, improve their attitudes toward patient health education, and gain 15 comprehensive knowledge and skills, thus improving patients' health outcomes and 16 quality of life, while also enhancing the overall quality of nursing. However, the related 17research is fragmented and there is a lack of systematic review of related literature. The 18 scoping review aims to provide a comprehensive overview of existing interventions 19 related to cultivating the patient health education competence of nursing personnel. 20 Methods and analysis We will use the Joanna Briggs Institute (JBI) methodology to

21 guide the scoping review proposed by this protocol. Between April 1, 2024, and April

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1	15, 2024, a systematic search of electronic bibliographic databases, including Cochrane
2	Library, PubMed, EMBASE, CINAHL, MEDLINE, and ERIC, will be conducted. In
3	addition, the gray literature source Google search engine will also be searched. Two
4	reviewers will independently screen and conduct data extraction. Any discrepancies
5	that arise will be resolved through consultation with a third reviewer. The data will be
6	analyzed and presented in tables, flow diagrams, and text.
7	Ethics and dissemination Ethical approval is not applicable for this study. We will
8	share the findings from the study at national and/or international conferences and in a
9	peer-reviewed journal in the fields of nursing education and/or patient education.
10	Registration number This scoping review had been registered on Open Science
11	Framework ( <u>http://osf.io/dapq7</u> ).
12	Strengths and limitations of this study
13	> The Preferred Reporting Items for Systematic Reviews and Meta-Analyses
14	extension for Scoping Reviews (PRISMA-ScR) checklist will be used to guide the
15	reporting of the scoping review.
16	> The review proposed by this protocol will follow the Joanna Briggs Institute (JBI)
17	methodology for scoping reviews.
18	> The scoping review will incorporate the gray literature source, the Google search
19	engine, to ensure a comprehensive and systematic literature search.
20	1. INTRODUCTION

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1	With the transformation of the disease-centered care model to the patient-centered
2	holistic care model, patient health education has gradually become an indispensable
3	and important part of nursing work. <sup>12</sup> Patient health education is a planned educational
4	process designed to impact patient behavior and result in changes in knowledge,
5	attitudes, and skills that are necessary for maintaining or improving health. <sup>3</sup> A series of
6	studies have demonstrated that effective patient health education can enhance patients'
7	comprehension of their own health status and measures for disease management. It has
8	been shown to improve their health literacy, alleviate anxiety, and foster increased
9	compliance and satisfaction with nursing personnel. Thus, it improves patients' health
10	outcomes and quality of life, while also enhancing the overall quality of nursing. <sup>2 4-8</sup>
11	Moreover, patient health education emerges as a cost-effective measure, offering
12	potential savings in healthcare costs and alleviating the overall economic burden on
13	society.9 A specific study demonstrated noteworthy cost-effectiveness, indicating that
14	for each USD 1 invested in patient health education services, there was a remarkable
15	saving of USD 6 in healthcare costs. <sup>2</sup>

While nursing personnel acknowledge the pivotal role of patient health education in their clinical practice, their performance in this domain remains below satisfactory levels.<sup>9-11</sup> Numerous studies consistently indicate that the absence of patient health education competence (PHEC) constitutes a significant impediment to the effective implementation of such education by nursing personnel.<sup>2</sup> <sup>9-11</sup> Effective training in PHEC can enable nursing personnel to recognize the importance of patient health

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education, improve their attitudes toward patient health education, and gain
comprehensive knowledge and skills, thus promoting the development of PHEC.<sup>12-14</sup>
Hence, it is imperative to enhance the PHEC of nurses and nursing students through
training, as this is crucial for improving their skills and fostering the development of
patient health education.

Although studies have documented interventions aimed at enhancing the PHEC of nursing personnel, a comprehensive review of these interventions has not been conducted at present.<sup>13-18</sup> It is unknown what types of interventions exist, what content and pedagogical methods are covered, and how interventions may improve nursing personnel's PHEC. Through systematic combing and analysis of the existing literature, we can develop a comprehensive framework that provides insights into the characteristics, strategies, and suitability of various interventions. This aids in identifying gaps and informing the development of future interventions to develop high-quality and effective evidence-based related training. Consequently, there is a pressing need for systematic analysis and integration of existing interventions to maximize their effectiveness, thereby providing a basis for constructing more effective interventions in the future. Furthermore, the existing literature is fragmented. Therefore, we propose the adoption of a scoping review to address this knowledge gap and gather dispersed information. The scoping review aims to provide a comprehensive overview of existing interventions related to cultivating the PHEC of nursing personnel. It intends to provide up-to-date, evidence-based recommendations related to the training of

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1	nursing personnel's PHEC for future researchers, intervention designers, and
2	educational policy makers.
3	Main review question
4	What intervention strategies (e.g., teaching modalities, teaching objectives,
5	teaching content, teaching methods, teaching duration and frequency, teaching media,
6	and teaching faculty) are being used for the interventions aimed at improving the PHEC
7	of nursing personnel?
8	Secondary review question
9	(1) What are the characteristics (e.g., year, country, study design) of the studies on
10	interventions aimed at improving the PHEC of nursing personnel?
11	(2) What are the outcomes measured and what assessment methods (e.g., quizzes,
12	interviews) are used to measure outcomes?
13	2. METHODS
14	We will use the Joanna Briggs Institute (JBI) methodology to guide the scoping
15	review proposed by this protocol. <sup>19</sup> The scoping review will be reported following the
16	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for
17	Scoping Reviews (PRISMA-ScR) checklist. <sup>20</sup> This scoping review had been registered
18	on Open Science Framework ( <u>http://osf.io/dapq7</u> ).
19	Inclusion and exclusion criteria
20	The PCC (Population, Concept, Context) model will guide the development of
21	inclusion and exclusion criteria.

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Population: Any nursing personnel (e.g., clinical nurses, nursing supervisors, nurse managers, and nursing students) in any clinical setting (e.g., hospital, community) are eligible. The literature will also be considered if the intervention is aimed at health professionals but includes nursing personnel, with at least half of the participants being nursing personnel.

6 Concept: Any intervention designed to improve nursing personnel's PHEC. Any
7 intervention content, intervention method, and intervention duration will be included as
8 concepts.

9 Context: Interventions provided in any setting by professional or non-professional
10 providers will be considered.

Literature type: This review will consider different research methods (e.g., quantitative, qualitative, and mixed methods study designs) for inclusion. Protocols, conference abstracts, and reviews will be excluded. If full-text versions of the studies are not available online, we will contact the authors of these articles, and if we are unable to obtain valid information after contacting the authors, we will exclude these articles. No limitation is on publication time and language. Enseignement Superieur (ABES) . Protected by copyright, including for uses related to text and data mining, Al training, and similar technologies.

17 Search strategy

18 Between April 1, 2024, and April 15, 2024, a systematic search of electronic 19 bibliographic databases, including Cochrane Library, PubMed, EMBASE, CINAHL, 20 MEDLINE, and ERIC, will be conducted. The search time limit will span from the 21 creation date of the respective libraries to the search date. Furthermore, references of

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1	included studies will be thoroughly searched to identify any additional eligible studies.
2	In addition, the gray literature source Google search engine will also be searched. The
3	literature search will employ a combination of subject terms and free words to ensure
4	comprehensive coverage. The search terms related to nursing, patient education,
5	competence, and training will be used. The search strategy tailored for PubMed is
6	presented in Table 1, while the corresponding search strategies for other databases can
7	be found in Supplementary file 1. A three-step search strategy will be employed: (1)
8	Initially, the researchers will conduct a limited search in PubMed and Embase to
9	analyze the MeSH terms and keywords found in the titles and abstracts. (2)
10	Subsequently, a comprehensive search will be carried out across all target databases,
11	using the search terms identified in the first step. (3) Finally, the researchers will
12	explore the reference lists of all identified articles to identify additional relevant studies.
13	Table 1. Search strategy for PubMed

1	#1	(Nurses[MeSH Terms] OR Students, Nursing[MeSH Terms]) OR
		(nurs*[tiab] OR nursing student*[tiab])
2	#2	(((Health Education[MeSH Terms] OR Patient Education as
		Topic[MeSH Terms]) OR (health education[tiab] OR education,
		health[tiab] OR patient education[tiab] OR education, patient*[tiab]
		OR education of patient*[tiab] OR patient teaching[tiab] OR patient
		training[tiab])) OR (hospital education[tiab] OR clinical
		education[tiab])) OR ((((((("educate individual"[tiab:~2]) OR
		("inform individual"[tiab:~2])) OR ("teach individual"[tiab:~2])) OR

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		("train individual"[tiab:~2])) OR ("learn individual"[tiab:~2])) OR
		((((("educate consumer"[tiab:~2]) OR ("inform consumer"[tiab:~2]))
		OR ("teach consumer"[tiab:~2])) OR ("train consumer"[tiab:~2])) OR
		("learn consumer"[tiab:~2]))) OR ((("educate patient"[tiab:~2]) OR
		("inform patient"[tiab:~2])) OR (((("teach patient"[tiab:~2]) OR ("train
		patient"[tiab:~2])) OR ("learn patient"[tiab:~2]))))
3	#3	((professional competence[MeSH Terms]) OR (competenc*[tiab] OR
		capabilit*[tiab] OR capacit*[tiab] OR abilit*[tiab])) OR
		((knowledge[tiab]) AND (skill*[tiab]))
4	#4	(education, nursing[MeSH Terms] OR nursing education
		research[MeSH Terms] OR Education, Nursing, Baccalaureate[MeSH
		Terms] OR Education, Nursing, Continuing[MeSH Terms] OR
		curriculum[MeSH Terms]) OR (educat*[tiab] OR teach*[tiab] OR
		learn*[tiab] OR course*[tiab] OR class*[tiab] OR train*[tiab] OR
		lecture*[tiab] OR intervene*[tiab] OR workshop[tiab])
5	#5	#1 AND #2 AND #3 AND #4

# 1 Study selection

We will manage study selection through Covidence. The selection will consist of two steps, conducted by two independent reviewers who will adhere to pre-specified eligibility criteria. In the first step of the screening process, titles and abstracts will be reviewed by two independent researchers according to the established eligibility criteria. Any discrepancies that arise will be resolved through consultation with a third reviewer. The second step will entail a full-text review of the studies that pass the first step, conducted by the same independent reviewers. In the event of a disagreement, a third

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> researcher will be consulted to assist with the literature screening. The results of the review will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.<sup>21</sup> Because this scoping review aims to provide a mapping of the available evidence rather than to offer a comprehensive, clinically meaningful answer to a specific question, we will not conduct risk of bias assessments or quality assessments for the included studies. The screening processes of this study are shown in Figure 1.

## 8 Data extraction

Two reviewers will conduct data extraction from the included studies independently, using the data extraction table. The data extraction table is shown in Supplementary file 2. In case of any discrepancies or disagreements, a third reviewer will be consulted to resolve them through discussion. The data to be extracted will include: (1) characteristics of all included studies (i.e., author, year of publication, country, type of study/design); (2) participants (i.e., target population, sample size, study setting); (3) study aims; (4) intervention strategies (i.e., teaching modalities, teaching objectives, teaching content, teaching methods, teaching duration and frequency, teaching media, and teaching faculty); (5) outcomes measured; (6) outcome assessment methods and measurement instruments; (7) key findings and conclusions.

# 

Synthesis and presentation of the results

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4	1	In accordance with the study objectives of this scoping review, we aim to offer a
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6	2	narrative description of the data, supplemented by the utilization of tables and flow
7	2	narrative description of the data, supplemented by the utilization of tables and now
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9	3	diagrams to enhance the visual representation of our findings.
10 11		
12	4	
13	4	Patient and public involvement
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15	5	Neither patients nor the public will be involved in this study.
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18	6	Ethics and dissemination
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20	7	Ethical approval is not applicable for this study. We will share the findings from
21	•	Ethical approval is not approache for this study. We will share the findings from
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23	8	the study at national and/or international conferences and in a peer-reviewed journal in
24		
25	9	the fields of nursing education and/or patient education.
26	9	the fields of hursing education and/of patient education.
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28 29	10	
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32	11	Author contributions All authors have read and agreed to the published version of the
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34	12	manuscript.
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36	10	
37	13	Conceptualization: GW, QC, ST;
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39	14	Methodology: QC, SW, GW;
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42	15	Data curation: QC, SW, KL, YQ;
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44 45	16	Data curation: QC, SW, KL, YQ; Writing—original draft preparation: SW, GW, LK;
45 46	10	writing original draft preparation. 5 W, 6 W, EK,
40		
48	17	Writing—review and editing: QC, ST, YQ;
49		
50	18	Supervision: QC and ST.
51	10	Supervision. QC and ST.
52		
53	19	Funding This work was supported by the National Natural Science Foundation of
54		
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58	21	2022JJ40642). Additionally, the study was funded by the "Youth Innovation Team Plan"
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- 2 **Competing interests** None declared.
- 3 **Patient consent** Not required.
- 4 **Data sharing statement** No additional data available.

## 5

- 6 List of Figures:
- 7 Figure 1. PRISMA flow diagram for this systematic review
- 8 List of Tables:
- 9 Table 1. Search strategy for PubMed

## 10 List of Supplementary File Tables:

- 11 Supplementary file 1. Search strategy for other databases
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- 13 Table S2. Search strategy for Embase
- 14 Table S3. Search strategy for Medline
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- 17 Supplementary file 2. Data extraction table
- 18 Table S1. The characteristics of included studies
- 19 Table S2. The extra characteristics of included studies
- 20 Supplementary file 3. PRISMA-ScR-checklist

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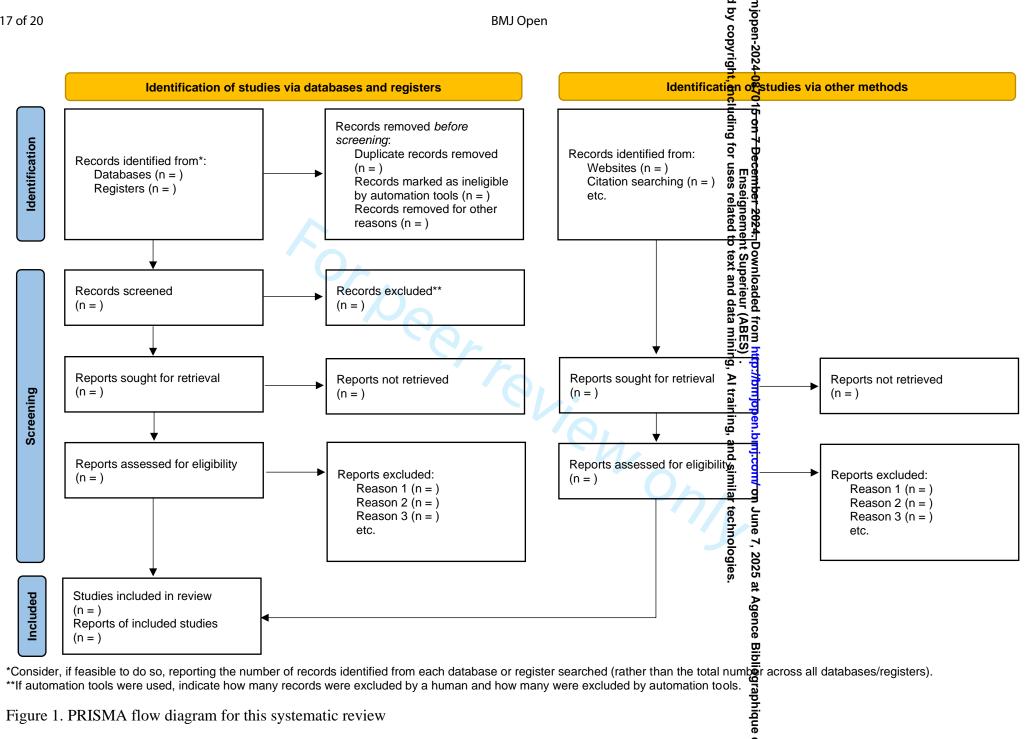
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## Table S1. Search strategy for Cochrane Library

1	#1	MeSH descriptor: [Nurses] this term only OR MeSH descriptor:
		[Students, Nursing] this term only OR (nurs* OR nursing
		student*):ti,ab,kw
2	#2	MeSH descriptor: [Health Education] this term only OR MeSH
		descriptor: [Patient Education as Topic] this term only OR (health
		education OR education, health OR patient education OR education,
		patient* OR education of patient* OR patient teaching OR patient
		training OR hospital education OR clinical education):ti,ab,kw OR
		((educat* OR inform* OR teach* OR train* OR learn*):ti,ab,kw
		NEAR/2 (health OR patient* OR consumer* OR
		individual*):ti,ab,kw)
3	#3	MeSH descriptor: [Professional Competence] this term only OR
		(competenc* OR capabilit* OR capacit* OR abilit*):ti,ab,kw OR
		((knowledge):ti,ab,kw NEAR/2 (skill*):ti,ab,kw)
4	#4	MeSH descriptor: [Education, Nursing] this term only OR MeSH
		descriptor: [Nursing Education Research] this term only OR MeSH
		descriptor: [Education, Nursing, Baccalaureate] this term only OR
		MeSH descriptor: [Education, Nursing, Continuing] this term only OR
		MeSH descriptor: [Curriculum] this term only OR (educat* OR teach*
		OR learn* OR course* OR class* OR train* OR lecture* OR
		intervene* OR workshop):ti,ab,kw
5	#5	#1 AND #2 AND #3 AND #4

## Table S2. Search strategy for Embase

1	#1	'nurse'/mj OR 'nursing student'/mj OR nurs*:ab,ti OR 'nursing
		student*':ab,ti
2	#2	('health education'/mj OR 'patient education'/mj OR 'health
		education':ab,ti OR 'education, health':ab,ti OR 'patient education':ab,ti
		OR 'education, patient*':ab,ti OR 'education of patient*':ab,ti OR '
		patient teaching ':ab,ti OR 'patient training':ab,ti OR 'hospital
		education':ab,ti OR 'clinical education':ab,ti) OR ((educat* OR
		inform* OR teach* OR train* OR learn*) NEXT/1 (health OR patient*
		OR consumer* OR individual*))
3	#3	'professional competence'/mj OR competenc*:ab,ti OR
		'competence'/mj OR 'competency'/mj OR 'competencies'/mj OR
		capabilit*:ab,ti OR 'capacitance'/mj OR 'capacity'/mj OR abilit*:ab,ti
		OR (knowledge:ab,ti AND skill*:ab,ti)
4	#4	'nursing education'/mj OR educat*:ab,ti OR teach*:ab,ti OR
		'curriculum'/mj OR learn*:ab,ti OR course*:ab,ti OR class*:ab,ti OR
		train*:ab,ti OR lecture*:ab,ti
5	#5	#1 AND #2 AND #3 AND #4

## Table S3. Search strategy for Medline

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1	#1	The search strategy of #1 is the same as that in Embase.
2	#2	The search strategy of #2 is the same as that in Embase.
3	#3	The search strategy of #3 is the same as that in Embase.
4	#4	The search strategy of #4 is the same as that in Embase.
5	#5	The search strategy of #5 is the same as that in Embase.

## Table S4. Search strategy for CINAHL

Nursing student*)(MM "Health Education") OR (MM " Patient Education") OR TI(health education OR education, health OR patient education OReducation, patient* OR education of patient* OR patient teaching ORpatient training OR hospital education OR clinical education) OR (AB(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (healthOR patient* OR consumer* OR individual*))(MM "Professional Competence") OR AB (competence* OR capabilit*
<ul> <li>(health education OR education, health OR patient education OR education, patient* OR education of patient* OR patient teaching OR patient training OR hospital education OR clinical education) OR (AB (educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*))</li> <li>(MM "Professional Competence") OR AB (competenc* OR capabilit*</li> </ul>
education, patient* OR education of patient* OR patient teaching OR patient training OR hospital education OR clinical education) OR (AB (educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*)) (MM "Professional Competence") OR AB (competenc* OR capabilit*
<ul> <li>patient training OR hospital education OR clinical education) OR (AB (educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*))</li> <li>(MM "Professional Competence") OR AB (competenc* OR capabilit*</li> </ul>
<ul> <li>(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health OR patient* OR consumer* OR individual*))</li> <li>(MM "Professional Competence") OR AB (competenc* OR capabilit*</li> </ul>
OR patient* OR consumer* OR individual*)) (MM "Professional Competence") OR AB (competenc* OR capabilit*
(MM "Professional Competence") OR AB (competenc* OR capabilit*
OR capacit* OR abilit*) OR AB (Knowledge N1 skill*)
(MM "Education, Nursing") OR (MM "Curriculum") OR AB (educat*
OR teach* OR learn* OR course* OR class* OR train* OR lecture*
OR intervene* OR workshop)
#1 AND #2 AND #3 AND #4

## Table S5. Search strategy for ERIC

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1	#1	(DE "Nurses") OR (DE "Students, Nursing") OR AB (nurs* OR
		Nursing student*)
2	#2	(DE "Health Education") OR (DE "Patient Education") OR AB (health
		education OR education, health OR patient education OR education,
		patient* OR education of patient* OR patient teaching OR patient
		training OR hospital education OR clinical education) OR (AB
		(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health
		OR patient* OR consumer* OR individual*))
3	#3	(DE "Professional Competence") OR AB (competenc* OR capabilit*
		OR capacit* OR abilit*) OR AB (Knowledge N1 skill*)
4	#4	(DE "Education, Nursing") OR (DE "Curriculum") OR AB (educat*
		OR teach* OR learn* OR course* OR class* OR train* OR lecture*
		OR intervene* OR workshop)
5	#5	#1 AND #2 AND #3 AND #4

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## Interventions to improve patient health education competence among nursing personnel: A scoping review protocol

Journal:	BMJ Open
Manuscript ID	bmjopen-2024-087015.R2
Article Type:	Protocol
Date Submitted by the Author:	10-Oct-2024
Complete List of Authors:	Wang, Guiyun; Shandong Xiehe University Wang, Shuyi; Central South University, Xiangya School of Nursing Liu, Ke; Central South University, Xiangya School of Nursing Tang, Siyuan; Central South University, Xiangya School of Nursing; Xiangya Center for Evidence-Based Nursing Practice & Healthcare Innovation: A JBI Centre of Excellence Qi, Yanxia; Shandong Xiehe University Chen, Qirong; Central South University, Xiangya School of Nursing; Xiangya Center for Evidence-Based Nursing Practice & Healthcare Innovation: A JBI Centre of Excellence
<b>Primary Subject Heading</b> :	Nursing
Secondary Subject Heading:	Medical education and training
Keywords:	Health Education, Nurses, EDUCATION & TRAINING (see Medical Education & Training)

# SCHOLARONE<sup>™</sup> Manuscripts

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1	Interventions to improve patient health education competence among nursing
2	personnel: A scoping review protocol
3	Guiyun Wang <sup>a</sup> , Shuyi Wang <sup>b,*</sup> , Ke Liu <sup>b</sup> , Siyuan Tang <sup>b,c</sup> , Yanxia Qi <sup>a</sup> , Qirong Chen <sup>b,c,*</sup>
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3 Keywords: Patient education; Health education; Nurse; Professional competence;

- 4 Nursing Education
- 5 **Word count: 2735**
- 6

7

ABSTRACT

Introduction Patient health education has gradually become an indispensable and 8 9 important part of nursing work. However, nursing personnel's performance in this domain remains below satisfactory levels. The absence of patient health education 10 competence constitutes a significant impediment to the effective implementation of 11 12such education by nursing personnel. Effective training in patient health education 13competence can enable nursing personnel to recognize the importance of patient health 14 education, improve their attitudes toward patient health education, and gain 15 comprehensive knowledge and skills, thus improving patients' health outcomes and 16 quality of life, while also enhancing the overall quality of nursing. However, the related 17research is fragmented and there is a lack of systematic review of related literature. The 18 scoping review aims to provide a comprehensive overview of existing interventions 19 related to cultivating the patient health education competence of nursing personnel. 20 Methods and analysis We will use the Joanna Briggs Institute (JBI) methodology to

21 guide the scoping review proposed by this protocol. Between April 1, 2024, and April

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1	15, 2024, a systematic search of electronic bibliographic databases, including Cochrane
2	Library, PubMed, EMBASE, CINAHL, MEDLINE, and ERIC, will be conducted. In
3	addition, the gray literature source Google search engine will also be searched. Two
4	reviewers will independently screen and conduct data extraction. Any discrepancies
5	that arise will be resolved through consultation with a third reviewer. The data will be
6	analyzed and presented in tables, flow diagrams, and text.
7	Ethics and dissemination Ethical approval is not applicable for this study. We will
8	share the findings from the study at national and/or international conferences and in a
9	peer-reviewed journal in the fields of nursing education and/or patient education.
10	Registration number This scoping review had been registered on Open Science
11	Framework ( <u>http://osf.io/dapq7</u> ).
12	Strengths and limitations of this study
13	> The Preferred Reporting Items for Systematic Reviews and Meta-Analyses
14	extension for Scoping Reviews (PRISMA-ScR) checklist will be used to guide the
15	reporting of the scoping review.
16	> The review proposed by this protocol will follow the Joanna Briggs Institute (JBI)
17	methodology for scoping reviews.
18	> The scoping review will incorporate the gray literature source, the Google search
19	engine, to ensure a comprehensive and systematic literature search.
20	1. INTRODUCTION

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1	With the transformation of the disease-centered care model to the patient-centered
2	holistic care model, patient health education has gradually become an indispensable
3	and important part of nursing work. <sup>12</sup> Patient health education is a planned educational
4	process designed to impact patient behavior and result in changes in knowledge,
5	attitudes, and skills that are necessary for maintaining or improving health. <sup>3</sup> A series of
6	studies have demonstrated that effective patient health education can enhance patients'
7	comprehension of their own health status and measures for disease management. It has
8	been shown to improve their health literacy, alleviate anxiety, and foster increased
9	compliance and satisfaction with nursing personnel. Thus, it improves patients' health
10	outcomes and quality of life, while also enhancing the overall quality of nursing. <sup>2 4-8</sup>
11	Moreover, patient health education emerges as a cost-effective measure, offering
12	potential savings in healthcare costs and alleviating the overall economic burden on
13	society.9 A specific study demonstrated noteworthy cost-effectiveness, indicating that
14	for each USD 1 invested in patient health education services, there was a remarkable
15	saving of USD 6 in healthcare costs. <sup>2</sup>

While nursing personnel acknowledge the pivotal role of patient health education in their clinical practice, their performance in this domain remains below satisfactory levels.<sup>9-11</sup> Numerous studies consistently indicate that the absence of patient health education competence (PHEC) constitutes a significant impediment to the effective implementation of such education by nursing personnel.<sup>2</sup> <sup>9-11</sup> Effective training in PHEC can enable nursing personnel to recognize the importance of patient health

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education, improve their attitudes toward patient health education, and gain
comprehensive knowledge and skills, thus promoting the development of PHEC.<sup>12-14</sup>
Hence, it is imperative to enhance the PHEC of nurses and nursing students through
training, as this is crucial for improving their skills and fostering the development of
patient health education.

Although studies have documented interventions aimed at enhancing the PHEC of nursing personnel, a comprehensive review of these interventions has not been conducted at present.<sup>13-18</sup> It is unknown what types of interventions exist, what content and pedagogical methods are covered, and how interventions may improve nursing personnel's PHEC. Through systematic combing and analysis of the existing literature, we can develop a comprehensive framework that provides insights into the characteristics, strategies, and suitability of various interventions. This aids in identifying gaps and informing the development of future interventions to develop high-quality and effective evidence-based related training. Consequently, there is a pressing need for systematic analysis and integration of existing interventions to maximize their effectiveness, thereby providing a basis for constructing more effective interventions in the future. Furthermore, the existing literature is fragmented. Therefore, we propose the adoption of a scoping review to address this knowledge gap and gather dispersed information. The scoping review aims to provide a comprehensive overview of existing interventions related to cultivating the PHEC of nursing personnel. It intends to provide up-to-date, evidence-based recommendations related to the training of

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1	nursing personnel's PHEC for future researchers, intervention designers, and
2	educational policy makers.
3	1.1 Main review question
4	What intervention strategies (e.g., teaching modalities, teaching objectives,
5	teaching content, teaching methods, teaching duration and frequency, teaching media,
6	and teaching faculty) are being used for the interventions aimed at improving the PHEC
7	of nursing personnel?
8	1.2 Secondary review question
9	(1) What are the characteristics (e.g., year, country, study design) of the studies on
10	interventions aimed at improving the PHEC of nursing personnel?
11	(2) What are the outcomes measured and what assessment methods (e.g., quizzes,
12	interviews) are used to measure outcomes?
13	2. METHODS
14	We will use the Joanna Briggs Institute (JBI) methodology to guide the scoping
15	review proposed by this protocol. <sup>19</sup> The scoping review will be reported following the
16	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for
17	Scoping Reviews (PRISMA-ScR) checklist. <sup>20</sup> This scoping review had been registered
18	on Open Science Framework ( <u>http://osf.io/dapq7</u> ).
19	2.1 Inclusion and exclusion criteria
20	The PCC (Population, Concept, Context) model will guide the development of
21	inclusion and exclusion criteria. The eligibility criteria are listed in Table 1.
	6

		Inclusion Criteria	Exclusion
		neusion enterna	
			Criteria
	Population	Any nursing personnel (e.g., clinical	Other he
		nurses, nursing supervisors, nurse	professio
		managers, and nursing students) in any	(e.g.,
		clinical setting (e.g., hospital,	doctors,
		community) are eligible.	therapists
			will
			excluded.
	Concept	Any intervention designed to improve	-
		nursing personnel's PHEC will be	
		eligible.	
	Context	Interventions provided in any setting	-
		(e.g., hospitals, communities,	
		universities, colleges) will be eligible.	
2	This review will con	sider different research methods (e.g., quantita	utive, qualit
3	and mixed methods study	y designs) for inclusion. Protocols, conferenc	e abstracts
0	and mixed methods stud	y designs) for merusion. I fotocolis, conference	e abstracts
4	reviews will be excluded.	If full-text versions of the studies are not avai	lable onlin
5	will contact the authors of	f these articles, and if we are unable to obtain va	alid inform
6	after contacting the aut	hors, we will exclude these articles. No l	imitation i
7	publication time and lang	guage.	

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1	В	etween	April 1, 2024, and April 15, 2024, a systematic search of electronic
2	bibliographic databases, including Cochrane Library, PubMed, EMBASE, CINAHL,		
3	MEDLINE, and ERIC, will be conducted. The search time limit will span from the		
4	creatio	n date o	of the respective libraries to the search date. Furthermore, references of
5	include	ed studi	es will be thoroughly searched to identify any additional eligible studies.
6	In addition, the gray literature source Google search engine will also be searched. The		
7	literatu	re sear	ch will employ a combination of subject terms and free words to ensure
8	compre	ehensiv	e coverage. The search terms related to nursing, patient education,
9	compe	tence, a	and training will be used. The search strategy tailored for PubMed is
10	present	ted in T	able 2, while the corresponding search strategies for other databases can
11	be four	nd in Su	upplementary file 1. A three-step search strategy will be employed: (1)
12	Initiall	y, the	researchers will conduct a limited search in PubMed and Embase to
13	analyze	e the 1	MeSH terms and keywords found in the titles and abstracts. (2)
14	Subseq	uently,	a comprehensive search will be carried out across all target databases,
15	using 1	the sear	rch terms identified in the first step. (3) Finally, the researchers will
16	explore	e the ref	erence lists of all identified articles to identify additional relevant studies.
17	Table 2. Search strategy for PubMed		
	1	#1	(Nurses[MeSH Terms] OR Students, Nursing[MeSH Terms]) OR
			(nurs*[tiab] OR nursing student*[tiab])
	-	1	

 #2 (((Health Education[MeSH Terms] OR Patient Education as Topic[MeSH Terms]) OR (health education[tiab] OR education, health[tiab] OR patient education[tiab] OR education, patient\*[tiab]

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		OR education of patient*[tiab] OR patient teaching[tiab] OR patient
		training[tiab])) OR (hospital education[tiab] OR clinica
		education[tiab])) OR ((((((("educate individual"[tiab:~2]) O
		("inform individual"[tiab:~2])) OR ("teach individual"[tiab:~2])) O
		("train individual"[tiab:~2])) OR ("learn individual"[tiab:~2])) O
		((((("educate consumer"[tiab:~2]) OR ("inform consumer"[tiab:~2])
		OR ("teach consumer"[tiab:~2])) OR ("train consumer"[tiab:~2])) O
		("learn consumer"[tiab:~2]))) OR (((("educate patient"[tiab:~2]) O
		("inform patient"[tiab:~2])) OR (((("teach patient"[tiab:~2]) OR ("trai
		patient"[tiab:~2])) OR ("learn patient"[tiab:~2]))))
3	#3	((professional competence[MeSH Terms]) OR (competenc*[tiab] O
		capabilit*[tiab] OR capacit*[tiab] OR abilit*[tiab])) O
		((knowledge[tiab]) AND (skill*[tiab]))
4	#4	(education, nursing[MeSH Terms] OR nursing education
		research[MeSH Terms] OR Education, Nursing, Baccalaureate[MeS]
		Terms] OR Education, Nursing, Continuing[MeSH Terms] O
		curriculum[MeSH Terms]) OR (educat*[tiab] OR teach*[tiab] O
		learn*[tiab] OR course*[tiab] OR class*[tiab] OR train*[tiab] O
		lecture*[tiab] OR intervene*[tiab] OR workshop[tiab])
5	#5	#1 AND #2 AND #3 AND #4

## **2.3 Study selection**

We will manage study selection through Covidence. The selection will consist of two steps, conducted by two independent reviewers who will adhere to pre-specified eligibility criteria. In the first step of the screening process, titles and abstracts will be

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reviewed by two independent researchers according to the established eligibility criteria. Any discrepancies that arise will be resolved through consultation with a third reviewer. The second step will entail a full-text review of the studies that pass the first step, conducted by the same independent reviewers. In the event of a disagreement, a third researcher will be consulted to assist with the literature screening. The results of the review will be reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram.<sup>21</sup> Because this scoping review aims to provide a mapping of the available evidence rather than to offer a comprehensive, clinically meaningful answer to a specific question, we will not conduct risk of bias assessments or quality assessments for the included studies. The screening processes of this study are shown in Figure 1.

## **2.4 Data extraction**

Two reviewers will conduct data extraction from the included studies independently, using the data extraction table. The data extraction table is shown in Supplementary file 2. In case of any discrepancies or disagreements, a third reviewer will be consulted to resolve them through discussion. The data to be extracted will include: (1) characteristics of all included studies (i.e., author, year of publication, country, type of study/design); (2) participants (i.e., target population, sample size, study setting); (3) study aims; (4) intervention strategies (i.e., teaching modalities, teaching objectives, teaching content, teaching methods, teaching duration and

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4 5	1	frequency, teaching media, and teaching faculty); (5) outcomes measured; (6) outcome
6		
7	2	assessment methods and measurement instruments; (7) key findings and conclusions.
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10	3	2.5 Synthesis and presentation of the results
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12	4	In accordance with the study objectives of this scoping review, we aim to offer a
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15	5	narrative description of the data, supplemented by the utilization of tables and flow
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17	6	diagrams to enhance the visual representation of our findings.
18 19	Ũ	diagrams to emiliance the vibrar representation of our minanigs.
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21	7	Patient and public involvement statement
22		
23	8	None.
24	0	
25	0	
26	9	Ethics and dissemination
27		
28	10	Ethical approval is not required for this study as it relies solely on published
29	10	Danieur upprovur is not required for any us it renes serely on published
30 31		
32	11	literature and does not involve private personal information or sensitive data. We will
33		
34	12	share the findings from the study at national and/or international conferences and in a
35		share the infantige from the stary at national and of international conferences and in a
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37	13	peer-reviewed journal in the fields of nursing education and/or patient education.
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42	15	Author contributions All authors have read and agreed to the published version of the
43 44		
45	16	manuscript.
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47	1 1	
48	17	Conceptualization: GW, QC, ST;
49		
50	18	Methodology: QC, SW, GW;
51		
52	10	
53 54	19	Data curation: QC, SW, KL, YQ;
54 55		
55 56	20	Writing—original draft preparation: SW, GW, LK;
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58	0.1	Writing review and additing OC ST VO
59	21	Writing—review and editing: QC, ST, YQ;
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1	Supervision: QC and ST. Shuyi Wang is the guarantor.
2	Funding This work was supported by the National Natural Science Foundation of
3	China (No. 72104250) and the Natural Science Foundation of Hunan Province (No.
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5	of Shandong Colleges and Universities, Grant Number: 2023KJ372.
6	Competing interests None declared.
7	Patient consent Not required.
8	Data sharing statement No additional data available.
9	
10	List of Figures:
11	Figure 1. PRISMA flow diagram for this systematic review
12	List of Tables:
13	Table 1. Eligibility criteria
14	Table 2. Search strategy for PubMed
15	List of Supplementary File Tables:
16	Supplementary file 1. Search strategy for other databases
17	Table S1. Search strategy for Cochrane Library
18	Table S2. Search strategy for Embase
19	Table S3. Search strategy for Medline
20	Table S4. Search strategy for CINAHL
21	Table S5. Search strategy for ERIC

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3 4 5	1	Supplementary file 2. Data extraction table
6 7 8	2	Table S1. The characteristics of included studies
9 10 11	3	Table S2. The extra characteristics of included studies
12 13	4	Supplementary file 3. PRISMA-ScR-checklist
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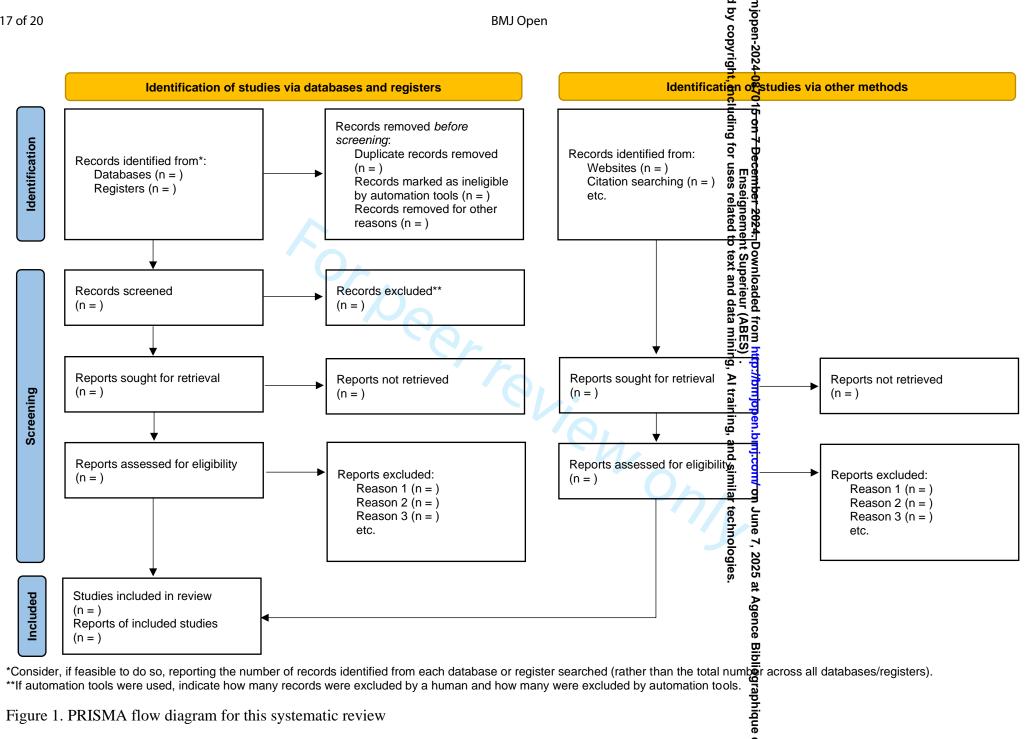
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## Table S1. Search strategy for Cochrane Library

1	#1	MeSH descriptor: [Nurses] this term only OR MeSH descriptor:
		[Students, Nursing] this term only OR (nurs* OR nursing
		student*):ti,ab,kw
2	#2	MeSH descriptor: [Health Education] this term only OR MeSH
		descriptor: [Patient Education as Topic] this term only OR (health
		education OR education, health OR patient education OR education,
		patient* OR education of patient* OR patient teaching OR patient
		training OR hospital education OR clinical education):ti,ab,kw OR
		((educat* OR inform* OR teach* OR train* OR learn*):ti,ab,kw
		NEAR/2 (health OR patient* OR consumer* OR
		individual*):ti,ab,kw)
3	#3	MeSH descriptor: [Professional Competence] this term only OR
		(competenc* OR capabilit* OR capacit* OR abilit*):ti,ab,kw OR
		((knowledge):ti,ab,kw NEAR/2 (skill*):ti,ab,kw)
4	#4	MeSH descriptor: [Education, Nursing] this term only OR MeSH
		descriptor: [Nursing Education Research] this term only OR MeSH
		descriptor: [Education, Nursing, Baccalaureate] this term only OR
		MeSH descriptor: [Education, Nursing, Continuing] this term only OR
		MeSH descriptor: [Curriculum] this term only OR (educat* OR teach*
		OR learn* OR course* OR class* OR train* OR lecture* OR
		intervene* OR workshop):ti,ab,kw
5	#5	#1 AND #2 AND #3 AND #4

## Table S2. Search strategy for Embase

1	#1	'nurse'/mj OR 'nursing student'/mj OR nurs*:ab,ti OR 'nursing student*':ab,ti
2	#2	('health education'/mj OR 'patient education'/mj OR 'health education':ab,ti OR 'education, health':ab,ti OR 'patient education':ab,ti OR 'education, patient*':ab,ti OR 'education of patient*':ab,ti OR ' patient teaching ':ab,ti OR 'patient training':ab,ti OR 'hospital education':ab,ti OR 'clinical education':ab,ti) OR ((educat* OR inform* OR teach* OR train* OR learn*) NEXT/1 (health OR patient* OR consumer* OR individual*))
3	#3	'professional competence'/mj OR competenc*:ab,ti OR 'competence'/mj OR 'competency'/mj OR 'competencies'/mj OR capabilit*:ab,ti OR 'capacitance'/mj OR 'capacity'/mj OR abilit*:ab,ti OR (knowledge:ab,ti AND skill*:ab,ti)
4	#4	'nursing education'/mj OR educat*:ab,ti OR teach*:ab,ti OR 'curriculum'/mj OR learn*:ab,ti OR course*:ab,ti OR class*:ab,ti OR train*:ab,ti OR lecture*:ab,ti
5	#5	#1 AND #2 AND #3 AND #4

## Table S3. Search strategy for Medline

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1	#1	The search strategy of #1 is the same as that in Embase.
2	#2	The search strategy of #2 is the same as that in Embase.
3	#3	The search strategy of #3 is the same as that in Embase.
4	#4	The search strategy of #4 is the same as that in Embase.
5	#5	The search strategy of #5 is the same as that in Embase.

## Table S4. Search strategy for CINAHL

1	#1	(MM "Nurses") OR (MM "Students, Nursing") OR AB (nurs* OR
		Nursing student*)
2	#2	(MM "Health Education") OR (MM " Patient Education") OR TI
		(health education OR education, health OR patient education OR
		education, patient* OR education of patient* OR patient teaching OR
		patient training OR hospital education OR clinical education) OR (AB
		(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health
		OR patient* OR consumer* OR individual*))
3	#3	(MM "Professional Competence") OR AB (competenc* OR capabilit*
		OR capacit* OR abilit*) OR AB (Knowledge N1 skill*)
4	#4	(MM "Education, Nursing") OR (MM "Curriculum") OR AB (educat*
		OR teach* OR learn* OR course* OR class* OR train* OR lecture*
		OR intervene* OR workshop)
5	#5	#1 AND #2 AND #3 AND #4
Table	S5 Se	arch strategy for ERIC

# Table S5. Search strategy for ERIC

4		
1	#1	(DE "Nurses") OR (DE "Students, Nursing") OR AB (nurs* OR
		Nursing student*)
2	#2	(DE "Health Education") OR (DE "Patient Education") OR AB (health
		education OR education, health OR patient education OR education,
		patient* OR education of patient* OR patient teaching OR patient
		training OR hospital education OR clinical education) OR (AB
		(educat* OR inform* OR teach* OR train* OR learn*) N1 AB (health
		OR patient* OR consumer* OR individual*))
3	#3	(DE "Professional Competence") OR AB (competenc* OR capabilit*
		OR capacit* OR abilit*) OR AB (Knowledge N1 skill*)
4	#4	(DE "Education, Nursing") OR (DE "Curriculum") OR AB (educat*
		OR teach* OR learn* OR course* OR class* OR train* OR lecture*
		OR intervene* OR workshop)
5	#5	#1 AND #2 AND #3 AND #4

Author(s)/year	<b>C t</b>	Type of	Participants       Target population         Sample size         Setting						Chalas		
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