



BMJ Open is committed to open peer review. As part of this commitment we make the peer review history of every article we publish publicly available.

When an article is published we post the peer reviewers' comments and the authors' responses online. We also post the versions of the paper that were used during peer review. These are the versions that the peer review comments apply to.

The versions of the paper that follow are the versions that were submitted during the peer review process. They are not the versions of record or the final published versions. They should not be cited or distributed as the published version of this manuscript.

BMJ Open is an open access journal and the full, final, typeset and author-corrected version of record of the manuscript is available on our site with no access controls, subscription charges or pay-per-view fees (<http://bmjopen.bmj.com>).

If you have any questions on BMJ Open's open peer review process please email info.bmjopen@bmj.com

BMJ Open

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

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2024-087015
Article Type:	Protocol
Date Submitted by the Author:	28-Mar-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
Keywords:	Health Education, Nurses, EDUCATION & TRAINING (see Medical Education & Training)

SCHOLARONE™
Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 **Interventions to improve patient health education competence among nursing**
2 **personnel: A scoping review protocol**

3 Guiyun Wang^a, Shuyi Wang^{b,*}, Ke Liu^b, Siyuan Tang^{b,c}, Yanxia Qi^a, Qirong Chen^{b,c,*}

4 a. School of Nursing, Shandong Xiehe University, Jinan, China.

5 b. Xiangya School of Nursing, Central South University, Changsha, China.

6 c. Xiangya Center for Evidence-Based Nursing Practice & Healthcare Innovation: A
7 JBI Centre of Excellence, Changsha, China.

8 ***Corresponding author:**

9 Qirong Chen

10 Address: 172 Tongzipo Road, Changsha, Hunan, 410013, China.

11 *Phone number:* (86)15084726637

12 Email address: qirong.chen@csu.edu.cn

13 Shuyi Wang

14 Address: 172 Tongzipo Road, Changsha, Hunan, 410013, China.

15 Phone number: (86)15514097627

16 Email address: wsy251941@csu.edu.cn

17 **Keywords:** Patient education; Health education; Nurse; Competence; Nursing
18 Education

19 **Word count: 2745**

21 **ABSTRACT**

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES).

Introduction Patient health education has gradually become an indispensable and important part of nursing work. However, nursing personnel's performance in this domain remains below satisfactory levels. The absence of patient health education competence constitutes a significant impediment to the effective implementation of such education by nursing personnel. Effective training in patient health education competence can enable nursing personnel to recognize the importance of patient health education, improve their attitudes toward patient health education, and gain comprehensive knowledge and skills, thus improving patients' health outcomes and quality of life, while also enhancing the overall quality of nursing. However, the related research is fragmented and there is a lack of systematic review of related literature. The scoping review aims to provide a comprehensive overview of existing interventions related to cultivating the patient health education competence of nursing personnel.

Methods and analysis We will use the Joanna Briggs Institute (JBI) methodology to guide the scoping review proposed by this protocol. Between April 1, 2024, and April 15, 2024, a systematic search of electronic bibliographic databases, including Cochrane Library, PubMed, EMBASE, CINAHL, MEDLINE, and ERIC, will be conducted. Two reviewers will independently screen and conduct data extraction. Any discrepancies that arise will be resolved through consultation with a third reviewer. The data will be analyzed and presented in tables, flow diagrams, and text.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Ethics and dissemination Ethical approval is not applicable for this study. We will share the findings from the study at national and/or international conferences and in a peer-reviewed journal in the fields of nursing education and/or patient education.

Registration number This scoping review had been registered on Open Science Framework (<http://osf.io/dapq7>).

Strengths and limitations of this study

- The Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist will be used to guide the reporting of the scoping review.
- The review proposed by this protocol will follow the Joanna Briggs Institute (JBI) methodology for scoping reviews.
- The scoping review may fail to include relevant literature published outside of the searched databases.

1. INTRODUCTION

With the transformation of the disease-centered care model to the patient-centered holistic care model, patient health education has gradually become an indispensable and important part of nursing work.^{1 2} Patient health education is a planned educational process designed to impact patient behavior and result in changes in knowledge, attitudes, and skills that are necessary for maintaining or improving health.³ A series of studies have demonstrated that effective patient health education can enhance patients' comprehension of their own health status and measures for disease management. It has

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Ensignement Supérieur (ABES).

1 been shown to improve their health literacy, alleviate anxiety, and foster increased
2 compliance and satisfaction with nursing personnel. Thus, it improves patients' health
3 outcomes and quality of life, while also enhancing the overall quality of nursing.^{2 4-8}
4 Moreover, patient health education emerges as a cost-effective measure, offering
5 potential savings in healthcare costs and alleviating the overall economic burden on
6 society.⁹ A specific study demonstrated noteworthy cost-effectiveness, indicating that
7 for each USD 1 invested in patient health education services, there was a remarkable
8 saving of USD 6 in healthcare costs.²

9 While nursing personnel acknowledge the pivotal role of patient health education
10 in their clinical practice, their performance in this domain remains below satisfactory
11 levels.⁹⁻¹¹ Numerous studies consistently indicate that the absence of patient health
12 education competence (PHEC) constitutes a significant impediment to the effective
13 implementation of such education by nursing personnel.^{2 9-11} Effective training in
14 PHEC can enable nursing personnel to recognize the importance of patient health
15 education, improve their attitudes toward patient health education, and gain
16 comprehensive knowledge and skills, thus promoting the development of PHEC.¹²⁻¹⁴
17 Hence, it is imperative to enhance the PHEC of nurses and nursing students through
18 training, as this is crucial for improving their skills and fostering the development of
19 patient health education.

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

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 conducted at present.¹³⁻¹⁸ 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.

17 **Review question**

18 (1) What are the characteristics (e.g., year, country, study design) of the studies on
19 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,

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES)

and teaching faculty) are being used for the interventions aimed at improving the PHEC of nursing personnel?

(3) What are the outcomes measured and what assessment methods (e.g., quizzes, interviews) are used to measure outcomes?

2. METHODS

We will use the Joanna Briggs Institute (JBI) methodology to guide the scoping review proposed by this protocol.¹⁹ The scoping review will be reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.²⁰ This scoping review had been registered on Open Science Framework (<http://osf.io/dapq7>).

Search strategy

Between April 1, 2024, and April 15, 2024, a systematic search of electronic bibliographic databases, including Cochrane Library, PubMed, EMBASE, CINAHL, MEDLINE, and ERIC, will be conducted. The search time limit will span from the creation date of the respective libraries to the search date. Furthermore, references of included studies will be thoroughly searched to identify any additional eligible studies. The literature search will employ a combination of subject terms and free words to ensure comprehensive coverage. The search terms related to nursing, patient education, competence, and training will be used. The search strategy tailored for PubMed is presented in Table 1, while the corresponding search strategies for other databases can be found in Supplementary file 1. A three-step search strategy will be employed: (1)

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Initially, the researchers will conduct a limited search in PubMed and Embase to
2 analyze the MeSH terms and keywords found in the titles and abstracts. (2)
3 Subsequently, a comprehensive search will be carried out across all target databases,
4 using the search terms identified in the first step. (3) Finally, the researchers will
5 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:~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

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.

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

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

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**

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

20 **Data extraction**

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES).

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

In accordance with the study objectives of this scoping review, we aim to offer a narrative description of the data, supplemented by the utilization of tables and flow diagrams to enhance the visual representation of our findings.

Patient and public involvement

Neither patients nor the public will be involved in this study.

Ethics and dissemination

Ethical approval is not applicable for this study. We will share the findings from the study at national and/or international conferences and in a peer-reviewed journal in the fields of nursing education and/or patient education.

3. DISCUSSION

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

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.

Data sharing statement No additional data available.

List of Figures:

Figure 1. PRISMA flow diagram for this systematic review

List of Tables:

Table 1. Search strategy for PubMed

List of Supplementary File Tables:

Supplementary file 1. Search strategy for other databases

Table S1. Search strategy for Cochrane Library

Table S2. Search strategy for Embase

Table S3. Search strategy for Medline

Table S4. Search strategy for CINAHL

Table S5. Search strategy for ERIC

Supplementary file 2. Data extraction table

Table S1. The characteristics of included studies

Table S2. The extra characteristics of included studies

Supplementary file 3. PRISMA-ScR-checklist

References:

1. Tinetti ME, Naik AD, Dodson JA. Moving From Disease-Centered to Patient Goals-Directed Care for Patients With Multiple Chronic Conditions: Patient Value-

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Based Care. *JAMA Cardiol* 2016;1(1):9-10. doi:
2 10.1001/jamacardio.2015.0248
3 2. Wang S, Liu K, Tang S, et al. Instruments for measuring patient health education
4 competence among nursing personnel: A COSMIN-based systematic review.
5 *Nurse Educ Pract* 2023;72:103798. doi: 10.1016/j.nepr.2023.103798
6 [published Online First: 20231003]
7 3. Patient education. American Academy of Family Physicians. *Am Fam Physician*
8 2000;62(7):1712-4.
9 4. Sassen B. Health Promotion and Health Education: Improving Patients' Health
10 Status. In: Sassen B, ed. *Nursing: Health Education and Improving Patient Self-*
11 *Management*. Cham: Springer International Publishing 2018:81-140.
12 5. Wittink H, Oosterhaven J. Patient education and health literacy. *Musculoskeletal*
13 *Science and Practice* 2018;38:120-27. doi:
14 <https://doi.org/10.1016/j.msksp.2018.06.004>
15 6. Bhattad PB, Pacifico L. Empowering Patients: Promoting Patient Education and
16 Health Literacy. *Cureus* 2022;14(7):e27336. doi: 10.7759/cureus.27336
17 [published Online First: 20220727]
18 7. Johnson AM, Brimhall AS, Johnson ET, et al. A systematic review of the
19 effectiveness of patient education through patient portals. *JAMIA Open*
20 2023;6(1):ooac085. doi: 10.1093/jamiaopen/ooac085 [published Online First:
21 20230118]

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES).

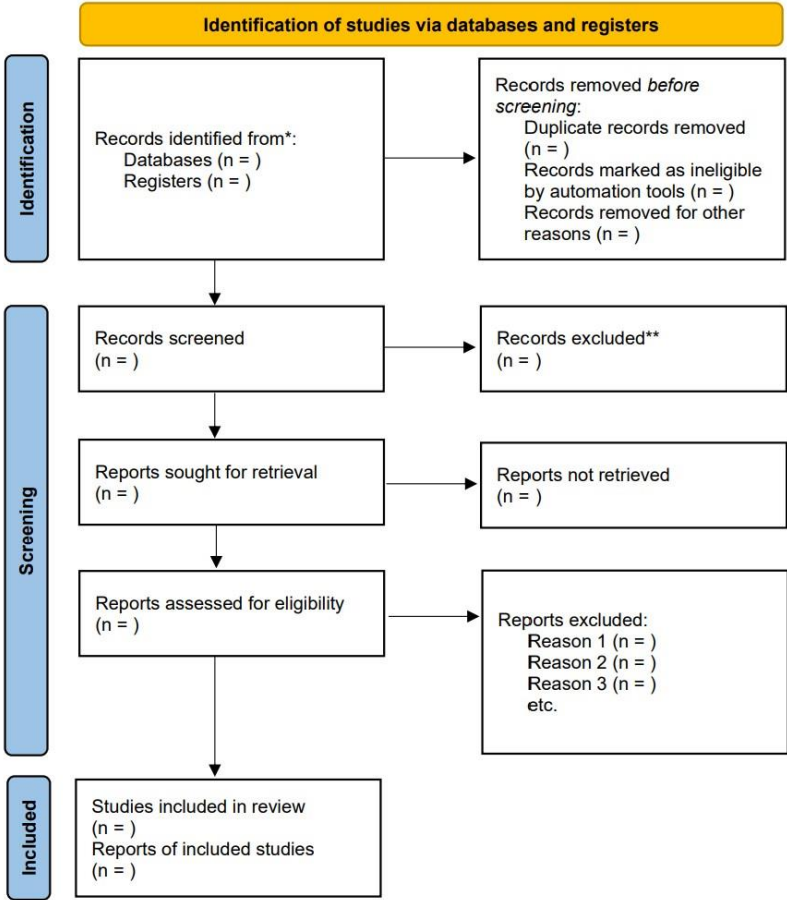
- 1 8. Wang S, Liu K, Shi Z, et al. Instruments for measuring patient health education
2 competence among nursing personnel: protocol for a COSMIN-based
3 systematic review. *BMJ Open* 2023;13(10):e072905. doi: 10.1136/bmjopen-
4 2023-072905 [published Online First: 20231006]
- 5 9. Lin LY, Wang RH. Patient Education Competence Scale for Registered Nurses in
6 Taiwan: Scale development and psychometric validation. *Jpn J Nurs Sci*
7 2017;14(2):117-25. doi: 10.1111/jjns.12141 [published Online First: 20160714]
- 8 10. Hwang HL, Kuo ML, Tu CT. Health education and competency scale: Development
9 and testing. *J Clin Nurs* 2018;27(3-4):e658-e67. doi: 10.1111/jocn.14116
10 [published Online First: 20171213]
- 11 11. Pueyo-Garrigues M, Pardavila-Belio MI, Whitehead D, et al. Nurses' knowledge,
12 skills and personal attributes for competent health education practice: An
13 instrument development and psychometric validation study. *J Adv Nurs*
14 2021;77(2):715-28. doi: 10.1111/jan.14632 [published Online First: 20201127]
- 15 12. Weiss ME, Piacentine LB, Candela L, et al. Effectiveness of using a simulation
16 combined with online learning approach to develop discharge teaching skills.
17 *Nurse Educ Pract* 2021;52:103024. doi: 10.1016/j.nepr.2021.103024
18 [published Online First: 20210312]
- 19 13. Martin-Delgado L, Goni-Fuste B, Monforte-Royo C, et al. A teaching role
20 practicum during the COVID-19 for final year nursing students in Spain: A

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 qualitative study. *J Prof Nurs* 2022;42:51-57. doi:
2 10.1016/j.profnurs.2022.06.005 [published Online First: 20220609]
3 14. Dong X, Zhang Z, Zhang X, et al. Effects of an online training program on
4 cardiovascular health behavior modification on nursing students' health
5 education competency. *Nurse Educ Today* 2023;127:105829. doi:
6 10.1016/j.nedt.2023.105829 [published Online First: 20230425]
7 15. Sezer H, Orgun F. Effectiveness of standardized patient on patient education skills
8 of nursing students - a pilot study. *J Pak Med Assoc* 2019;69(12):1848-54. doi:
9 10.5455/jpma.1590
10 16. Torkshavand G, Khatiban M, Soltanian AR. Simulation-based learning to enhance
11 students' knowledge and skills in educating older patients. *Nurse Educ Pract*
12 2020;42:102678. doi: 10.1016/j.nepr.2019.102678 [published Online First:
13 20191122]
14 17. Banayat A, Goyena KH, Valenzuela IL. EFFECTS IN EDUCATION
15 COMPETENCY SELF-ASSESSMENT OF A BASIC HEALTH
16 EDUCATION ONLINE COURSE FOR HEALTH PROFESSIONALS IN
17 PEDIATRIC HEMATOLOGY-ONCOLOGY: A PILOT STUDY. *Pediatric*
18 *Blood and Cancer* 2022;69:S530. doi: 10.1002/pbc.29952
19 18. Wang L, Wang Y, Wang X, et al. Effects of mind mapping based on standardized
20 patient program in patient education among postgraduate nursing students in

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES).

- 1 clinical setting. *BMC Med Educ* 2023;23(1):982. doi: 10.1186/s12909-023-
2 04944-4 [published Online First: 20231220]
3
4 19. Peters MDJ, Marnie C, Tricco AC, et al. Updated methodological guidance for the
5 conduct of scoping reviews. *JBIM Evid Implement* 2021;19(1):3-10. doi:
6 10.1097/xe.0000000000000277
7
8 20. Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews
9 (PRISMA-ScR): checklist and explanation. *Annals of internal medicine*
10 2018;169(7):467-73.
11
12 21. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an
13 updated guideline for reporting systematic reviews. *Bmj* 2021;372



*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

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

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. Search strategy for ERIC

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

Table S1. The characteristics of included studies

Author(s)/year developed	Country	Type of study	Participants			Study aims	Key findings and conclusions
			Target population	Sample size	Setting		

Table S2. The extra characteristics of included studies

Author(s)/year developed	intervention strategies							outcomes measured	outcome assessment methods/measurement instruments
	teaching modalities	teaching objectives	teaching content	teaching methods	teaching duration and frequency	teaching media	teaching faculty		

BMJ Open

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

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2024-087015.R1
Article Type:	Protocol
Date Submitted by the Author:	24-Sep-2024
Complete List of Authors:	Wang, Guiyun; Shandong Xiehe University Wang, Shuyi; Central South University Xiangya School of Nursing, 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
Primary Subject Heading:	Nursing
Secondary Subject Heading:	Medical education and training
Keywords:	Health Education, Nurses, EDUCATION & TRAINING (see Medical Education & Training)

SCHOLARONE™
Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 **Interventions to improve patient health education competence among nursing**
2 **personnel: A scoping review protocol**

3 Guiyun Wang^a, Shuyi Wang^{b,*}, Ke Liu^b, Siyuan Tang^{b,c}, Yanxia Qi^a, Qirong Chen^{b,c,*}

4 a. School of Nursing, Shandong Xiehe University, Jinan, China.

5 b. Xiangya School of Nursing, Central South University, Changsha, China.

6 c. Xiangya Center for Evidence-Based Nursing Practice & Healthcare Innovation: A
7 JBI Centre of Excellence, Changsha, China.

8 ***Corresponding author:**

9 Qirong Chen

10 Address: 172 Tongzipo Road, Changsha, Hunan, 410013, China.

11 *Phone number:* (86)15084726637

12 Email address: qirong.chen@csu.edu.cn

13 Shuyi Wang

14 Address: 172 Tongzipo Road, Changsha, Hunan, 410013, China.

15 Phone number: (86)15514097627

16 Email address: wsy251941@163.com

17 **ORCID ID and e-mail for all authors:**

18 Guiyun Wang: 0009-0008-5125-4920; wangguiyun@sdxiehe.edu.cn

19 Shuyi Wang: 0000-0003-4436-9101; wsy251941@163.com

20 Ke Liu: 0009-0000-5078-346X; 2641323590@qq.com

21 Siyuan Tang: 0000-0001-9940-5072; tsycongcong@126.com

1 Yanxia Qi: 0009-0001-9195-6467; 13698609592@163.com

2 Qirong Chen: 0000-0003-1908-290X; qirong.chen@csu.edu.cn

3 **Keywords:** Patient education; Health education; Nurse; Professional competence;
4 Nursing Education

5 **Word count: 2710**

6 7 **ABSTRACT**

8 **Introduction** Patient health education has gradually become an indispensable and
9 important part of nursing work. However, nursing personnel's performance in this
10 domain remains below satisfactory levels. The absence of patient health education
11 competence constitutes a significant impediment to the effective implementation of
12 such education by nursing personnel. Effective training in patient health education
13 competence 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
17 research 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

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

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 (<http://osf.io/dapq7>).

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**

With the transformation of the disease-centered care model to the patient-centered holistic care model, patient health education has gradually become an indispensable and important part of nursing work.^{1 2} Patient health education is a planned educational process designed to impact patient behavior and result in changes in knowledge, attitudes, and skills that are necessary for maintaining or improving health.³ A series of studies have demonstrated that effective patient health education can enhance patients' comprehension of their own health status and measures for disease management. It has 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.^{2 4-8} Moreover, patient health education emerges as a cost-effective measure, offering potential savings in healthcare costs and alleviating the overall economic burden on society.⁹ 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.²

While nursing personnel acknowledge the pivotal role of patient health education in their clinical practice, their performance in this domain remains below satisfactory levels.⁹⁻¹¹ 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.^{2 9-11} Effective training in PHEC can enable nursing personnel to recognize the importance of patient health

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 education, improve their attitudes toward patient health education, and gain
2 comprehensive knowledge and skills, thus promoting the development of PHEC.¹²⁻¹⁴
3 Hence, it is imperative to enhance the PHEC of nurses and nursing students through
4 training, as this is crucial for improving their skills and fostering the development of
5 patient health education.

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

nursing personnel's PHEC for future researchers, intervention designers, and educational policy makers.

Main review question

What intervention strategies (e.g., teaching modalities, teaching objectives, teaching content, teaching methods, teaching duration and frequency, teaching media, and teaching faculty) are being used for the interventions aimed at improving the PHEC of nursing personnel?

Secondary 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?

(2) What are the outcomes measured and what assessment methods (e.g., quizzes, interviews) are used to measure outcomes?

2. METHODS

We will use the Joanna Briggs Institute (JBI) methodology to guide the scoping review proposed by this protocol.¹⁹ The scoping review will be reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.²⁰ This scoping review had been registered on Open Science Framework (<http://osf.io/dapq7>).

Inclusion and exclusion criteria

The PCC (Population, Concept, Context) model will guide the development of inclusion and exclusion criteria.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Population: Any nursing personnel (e.g., clinical nurses, nursing supervisors,
2 nurse managers, and nursing students) in any clinical setting (e.g., hospital, community)
3 are eligible. The literature will also be considered if the intervention is aimed at health
4 professionals but includes nursing personnel, with at least half of the participants being
5 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.

11 Literature type: This review will consider different research methods (e.g.,
12 quantitative, qualitative, and mixed methods study designs) for inclusion. Protocols,
13 conference abstracts, and reviews will be excluded. If full-text versions of the studies
14 are not available online, we will contact the authors of these articles, and if we are
15 unable to obtain valid information after contacting the authors, we will exclude these
16 articles. No limitation is on publication time and language.

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

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES) :

included studies will be thoroughly searched to identify any additional eligible studies.

In addition, the gray literature source Google search engine will also be searched. The literature search will employ a combination of subject terms and free words to ensure comprehensive coverage. The search terms related to nursing, patient education, competence, and training will be used. The search strategy tailored for PubMed is presented in Table 1, while the corresponding search strategies for other databases can 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.

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:~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

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

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

8 **Data extraction**

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

19 **Synthesis and presentation of the results**

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

In accordance with the study objectives of this scoping review, we aim to offer a narrative description of the data, supplemented by the utilization of tables and flow diagrams to enhance the visual representation of our findings.

Patient and public involvement

Neither patients nor the public will be involved in this study.

Ethics and dissemination

Ethical approval is not applicable for this study. We will share the findings from the study at national and/or international conferences and in a peer-reviewed journal in the fields of nursing education and/or patient education.

Author contributions All authors have read and agreed to the published version of the manuscript.

Conceptualization: GW, QC, ST;

Methodology: QC, SW, GW;

Data curation: QC, SW, KL, YQ;

Writing—original draft preparation: SW, GW, LK;

Writing—review and editing: QC, ST, YQ;

Supervision: QC and ST.

Funding This work was supported by the National Natural Science Foundation of China (No. 72104250) and the Natural Science Foundation of Hunan Province (No. 2022JJ40642). Additionally, the study was funded by the “Youth Innovation Team Plan”

of Shandong Colleges and Universities, Grant Number: 2023KJ372.

Competing interests None declared.

Patient consent Not required.

Data sharing statement No additional data available.

List of Figures:

Figure 1. PRISMA flow diagram for this systematic review

List of Tables:

Table 1. Search strategy for PubMed

List of Supplementary File Tables:

Supplementary file 1. Search strategy for other databases

Table S1. Search strategy for Cochrane Library

Table S2. Search strategy for Embase

Table S3. Search strategy for Medline

Table S4. Search strategy for CINAHL

Table S5. Search strategy for ERIC

Supplementary file 2. Data extraction table

Table S1. The characteristics of included studies

Table S2. The extra characteristics of included studies

Supplementary file 3. PRISMA-ScR-checklist

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

References:

1. Tinetti ME, Naik AD, Dodson JA. Moving From Disease-Centered to Patient Goals-Directed Care for Patients With Multiple Chronic Conditions: Patient Value-Based Care. *JAMA Cardiol* 2016;1(1):9-10. doi: 10.1001/jamacardio.2015.0248

2. Wang S, Liu K, Tang S, et al. Instruments for measuring patient health education competence among nursing personnel: A COSMIN-based systematic review. *Nurse Educ Pract* 2023;72:103798. doi: 10.1016/j.nepr.2023.103798 [published Online First: 20231003]

3. Patient education. American Academy of Family Physicians. *Am Fam Physician* 2000;62(7):1712-4.

4. Sassen B. Health Promotion and Health Education: Improving Patients' Health Status. In: Sassen B, ed. *Nursing: Health Education and Improving Patient Self-Management*. Cham: Springer International Publishing 2018:81-140.

5. Wittink H, Oosterhaven J. Patient education and health literacy. *Musculoskeletal Science and Practice* 2018;38:120-27. doi: <https://doi.org/10.1016/j.msksp.2018.06.004>

6. Bhattad PB, Pacifico L. Empowering Patients: Promoting Patient Education and Health Literacy. *Cureus* 2022;14(7):e27336. doi: 10.7759/cureus.27336 [published Online First: 20220727]

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Ensignment Supérieur (ABES).

- 1 7. Johnson AM, Brimhall AS, Johnson ET, et al. A systematic review of the
2 effectiveness of patient education through patient portals. *JAMIA Open*
3 2023;6(1):ooac085. doi: 10.1093/jamiaopen/ooac085 [published Online First:
4 20230118]
- 5 8. Wang S, Liu K, Shi Z, et al. Instruments for measuring patient health education
6 competence among nursing personnel: protocol for a COSMIN-based
7 systematic review. *BMJ Open* 2023;13(10):e072905. doi: 10.1136/bmjopen-
8 2023-072905 [published Online First: 20231006]
- 9 9. Lin LY, Wang RH. Patient Education Competence Scale for Registered Nurses in
10 Taiwan: Scale development and psychometric validation. *Jpn J Nurs Sci*
11 2017;14(2):117-25. doi: 10.1111/jjns.12141 [published Online First: 20160714]
- 12 10. Hwang HL, Kuo ML, Tu CT. Health education and competency scale: Development
13 and testing. *J Clin Nurs* 2018;27(3-4):e658-e67. doi: 10.1111/jocn.14116
14 [published Online First: 20171213]
- 15 11. Pueyo-Garrigues M, Pardavila-Belio MI, Whitehead D, et al. Nurses' knowledge,
16 skills and personal attributes for competent health education practice: An
17 instrument development and psychometric validation study. *J Adv Nurs*
18 2021;77(2):715-28. doi: 10.1111/jan.14632 [published Online First: 20201127]
- 19 12. Weiss ME, Piacentine LB, Candela L, et al. Effectiveness of using a simulation
20 combined with online learning approach to develop discharge teaching skills.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Nurse Educ Pract 2021;52:103024. doi: 10.1016/j.nepr.2021.103024 [published
2 Online First: 20210312]

3 13. Martin-Delgado L, Goni-Fuste B, Monforte-Royo C, et al. A teaching role
4 practicum during the COVID-19 for final year nursing students in Spain: A
5 qualitative study. J Prof Nurs 2022;42:51-57. doi:
6 10.1016/j.profnurs.2022.06.005 [published Online First: 20220609]

7 14. Dong X, Zhang Z, Zhang X, et al. Effects of an online training program on
8 cardiovascular health behavior modification on nursing students' health
9 education competency. Nurse Educ Today 2023;127:105829. doi:
10 10.1016/j.nedt.2023.105829 [published Online First: 20230425]

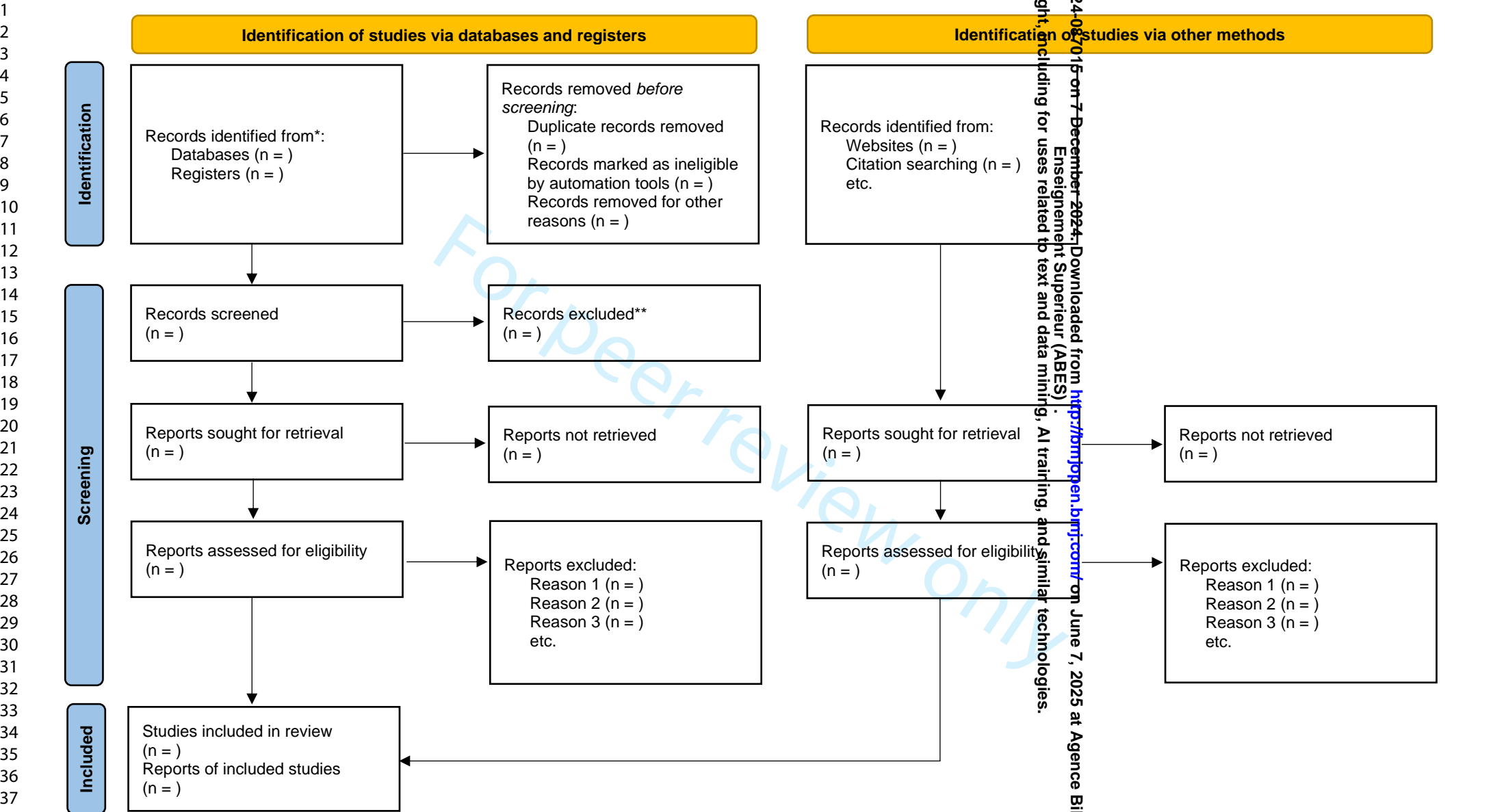
11 15. Sezer H, Orgun F. Effectiveness of standardized patient on patient education skills
12 of nursing students - a pilot study. J Pak Med Assoc 2019;69(12):1848-54. doi:
13 10.5455/jpma.1590

14 16. Torkshavand G, Khatiban M, Soltanian AR. Simulation-based learning to enhance
15 students' knowledge and skills in educating older patients. Nurse Educ Pract
16 2020;42:102678. doi: 10.1016/j.nepr.2019.102678 [published Online First:
17 20191122]

18 17. Banayat A, Goyena KH, Valenzuela IL. EFFECTS IN EDUCATION
19 COMPETENCY SELF-ASSESSMENT OF A BASIC HEALTH
20 EDUCATION ONLINE COURSE FOR HEALTH PROFESSIONALS IN

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Ensignement Supérieur (ABES).

- 1 PEDIATRIC HEMATOLOGY-ONCOLOGY: A PILOT STUDY. *Pediatric*
2 *Blood and Cancer* 2022;69:S530. doi: 10.1002/pbc.29952
- 3 18. Wang L, Wang Y, Wang X, et al. Effects of mind mapping based on standardized
4 patient program in patient education among postgraduate nursing students in
5 clinical setting. *BMC Med Educ* 2023;23(1):982. doi: 10.1186/s12909-023-
6 04944-4 [published Online First: 20231220]
- 7 19. Peters MDJ, Marnie C, Tricco AC, et al. Updated methodological guidance for the
8 conduct of scoping reviews. *JBIM Evid Implement* 2021;19(1):3-10. doi:
9 10.1097/xeib.0000000000000277
- 10 20. Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews
11 (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018;169(7):467-
12 73. doi: 10.7326/m18-0850 [published Online First: 20180904]
- 13 21. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an
14 updated guideline for reporting systematic reviews. *Bmj* 2021;372:n71. doi:
15 10.1136/bmj.n71 [published Online First: 20210329]



*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

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

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. Search strategy for ERIC

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

Table S1. The characteristics of included studies

Author(s)/year developed	Country	Type of study	Participants			Study aims	Key findings and conclusions
			Target population	Sample size	Setting		

Table S2. The extra characteristics of included studies

Author(s)/year developed	intervention strategies							outcomes measured	outcome assessment methods/measurement instruments
	teaching modalities	teaching objectives	teaching content	teaching methods	teaching duration and frequency	teaching media	teaching faculty		

BMJ Open

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

SCHOLARONE™
Manuscripts

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 **Interventions to improve patient health education competence among nursing**
2 **personnel: A scoping review protocol**

3 Guiyun Wang^a, Shuyi Wang^{b,*}, Ke Liu^b, Siyuan Tang^{b,c}, Yanxia Qi^a, Qirong Chen^{b,c,*}

4 a. School of Nursing, Shandong Xiehe University, Jinan, China.

5 b. Xiangya School of Nursing, Central South University, Changsha, China.

6 c. Xiangya Center for Evidence-Based Nursing Practice & Healthcare Innovation: A
7 JBI Centre of Excellence, Changsha, China.

8 ***Corresponding author:**

9 Qirong Chen

10 Address: 172 Tongzipo Road, Changsha, Hunan, 410013, China.

11 *Phone number:* (86)15084726637

12 Email address: qirong.chen@csu.edu.cn

13 Shuyi Wang

14 Address: 172 Tongzipo Road, Changsha, Hunan, 410013, China.

15 Phone number: (86)15514097627

16 Email address: wsy251941@163.com

17 **ORCID ID and e-mail for all authors:**

18 Guiyun Wang: 0009-0008-5125-4920; wangguiyun@sdxiehe.edu.cn

19 Shuyi Wang: 0000-0003-4436-9101; wsy251941@163.com

20 Ke Liu: 0009-0000-5078-346X; 2641323590@qq.com

21 Siyuan Tang: 0000-0001-9940-5072; tsycongcong@126.com

1 Yanxia Qi: 0009-0001-9195-6467; 13698609592@163.com

2 Qirong Chen: 0000-0003-1908-290X; qirong.chen@csu.edu.cn

3 **Keywords:** Patient education; Health education; Nurse; Professional competence;
4 Nursing Education

5 **Word count: 2735**

6 7 **ABSTRACT**

8 **Introduction** Patient health education has gradually become an indispensable and
9 important part of nursing work. However, nursing personnel's performance in this
10 domain remains below satisfactory levels. The absence of patient health education
11 competence constitutes a significant impediment to the effective implementation of
12 such education by nursing personnel. Effective training in patient health education
13 competence 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
17 research 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

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

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 (<http://osf.io/dapq7>).

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**

With the transformation of the disease-centered care model to the patient-centered holistic care model, patient health education has gradually become an indispensable and important part of nursing work.^{1 2} Patient health education is a planned educational process designed to impact patient behavior and result in changes in knowledge, attitudes, and skills that are necessary for maintaining or improving health.³ A series of studies have demonstrated that effective patient health education can enhance patients' comprehension of their own health status and measures for disease management. It has 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.^{2 4-8} Moreover, patient health education emerges as a cost-effective measure, offering potential savings in healthcare costs and alleviating the overall economic burden on society.⁹ 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.²

While nursing personnel acknowledge the pivotal role of patient health education in their clinical practice, their performance in this domain remains below satisfactory levels.⁹⁻¹¹ 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.^{2 9-11} Effective training in PHEC can enable nursing personnel to recognize the importance of patient health

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 education, improve their attitudes toward patient health education, and gain
2 comprehensive knowledge and skills, thus promoting the development of PHEC.¹²⁻¹⁴
3 Hence, it is imperative to enhance the PHEC of nurses and nursing students through
4 training, as this is crucial for improving their skills and fostering the development of
5 patient health education.

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

nursing personnel's PHEC for future researchers, intervention designers, and educational policy makers.

1.1 Main review question

What intervention strategies (e.g., teaching modalities, teaching objectives, teaching content, teaching methods, teaching duration and frequency, teaching media, and teaching faculty) are being used for the interventions aimed at improving the PHEC of nursing personnel?

1.2 Secondary 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?

(2) What are the outcomes measured and what assessment methods (e.g., quizzes, interviews) are used to measure outcomes?

2. METHODS

We will use the Joanna Briggs Institute (JBI) methodology to guide the scoping review proposed by this protocol.¹⁹ The scoping review will be reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist.²⁰ This scoping review had been registered on Open Science Framework (<http://osf.io/dapq7>).

2.1 Inclusion and exclusion criteria

The PCC (Population, Concept, Context) model will guide the development of inclusion and exclusion criteria. The eligibility criteria are listed in Table 1.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1 Table 1. Eligibility criteria

	Inclusion Criteria	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.	Other health professionals (e.g., doctors, therapists) will be 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 consider different research methods (e.g., quantitative, qualitative,
3 and mixed methods study designs) for inclusion. Protocols, conference abstracts, and
4 reviews will be excluded. If full-text versions of the studies are not available online, we
5 will contact the authors of these articles, and if we are unable to obtain valid information
6 after contacting the authors, we will exclude these articles. No limitation is on
7 publication time and language.

8 **2.2 Search strategy**

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES).

Between April 1, 2024, and April 15, 2024, a systematic search of electronic bibliographic databases, including Cochrane Library, PubMed, EMBASE, CINAHL, MEDLINE, and ERIC, will be conducted. The search time limit will span from the creation date of the respective libraries to the search date. Furthermore, references of included studies will be thoroughly searched to identify any additional eligible studies. In addition, the gray literature source Google search engine will also be searched. The literature search will employ a combination of subject terms and free words to ensure comprehensive coverage. The search terms related to nursing, patient education, competence, and training will be used. The search strategy tailored for PubMed is presented in Table 2, while the corresponding search strategies for other databases can 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.

Table 2. 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:~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

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

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.²¹ 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

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

frequency, teaching media, and teaching faculty); (5) outcomes measured; (6) outcome assessment methods and measurement instruments; (7) key findings and conclusions.

2.5 Synthesis and presentation of the results

In accordance with the study objectives of this scoping review, we aim to offer a narrative description of the data, supplemented by the utilization of tables and flow diagrams to enhance the visual representation of our findings.

Patient and public involvement statement

None.

Ethics and dissemination

Ethical approval is not required for this study as it relies solely on published literature and does not involve private personal information or sensitive data. We will share the findings from the study at national and/or international conferences and in a peer-reviewed journal in the fields of nursing education and/or patient education.

Author contributions All authors have read and agreed to the published version of the manuscript.

Conceptualization: GW, QC, ST;

Methodology: QC, SW, GW;

Data curation: QC, SW, KL, YQ;

Writing—original draft preparation: SW, GW, LK;

Writing—review and editing: QC, ST, YQ;

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES).

Supervision: QC and ST. Shuyi Wang is the guarantor.

Funding This work was supported by the National Natural Science Foundation of China (No. 72104250) and the Natural Science Foundation of Hunan Province (No. 2022JJ40642). Additionally, the study was funded by the “Youth Innovation Team Plan” of Shandong Colleges and Universities, Grant Number: 2023KJ372.

Competing interests None declared.

Patient consent Not required.

Data sharing statement No additional data available.

List of Figures:

Figure 1. PRISMA flow diagram for this systematic review

List of Tables:

Table 1. Eligibility criteria

Table 2. Search strategy for PubMed

List of Supplementary File Tables:

Supplementary file 1. Search strategy for other databases

Table S1. Search strategy for Cochrane Library

Table S2. Search strategy for Embase

Table S3. Search strategy for Medline

Table S4. Search strategy for CINAHL

Table S5. Search strategy for ERIC

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

- 1 Supplementary file 2. Data extraction table
- 2 Table S1. The characteristics of included studies
- 3 Table S2. The extra characteristics of included studies
- 4 Supplementary file 3. PRISMA-ScR-checklist

6 **References:**

7 1. Tinetti ME, Naik AD, Dodson JA. Moving From Disease-Centered to Patient Goals-
8 Directed Care for Patients With Multiple Chronic Conditions: Patient Value-
9 Based Care. JAMA Cardiol 2016;1(1):9-10. doi:
10 10.1001/jamacardio.2015.0248

11 2. Wang S, Liu K, Tang S, et al. Instruments for measuring patient health education
12 competence among nursing personnel: A COSMIN-based systematic review.
13 Nurse Educ Pract 2023;72:103798. doi: 10.1016/j.nepr.2023.103798 [published
14 Online First: 20231003]

15 3. Patient education. American Academy of Family Physicians. Am Fam Physician
16 2000;62(7):1712-4.

17 4. Sassen B. Health Promotion and Health Education: Improving Patients’ Health
18 Status. In: Sassen B, ed. Nursing: Health Education and Improving Patient Self-
19 Management. Cham: Springer International Publishing 2018:81-140.

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies.
Enseignement Supérieur (ABES)

- 1 5. Wittink H, Oosterhaven J. Patient education and health literacy. *Musculoskeletal*
- 2 *Science and Practice* 2018;38:120-27. doi:
- 3 <https://doi.org/10.1016/j.msksp.2018.06.004>
- 4 6. Bhattad PB, Pacifico L. Empowering Patients: Promoting Patient Education and
- 5 *Health Literacy. Cureus* 2022;14(7):e27336. doi: 10.7759/cureus.27336
- 6 [published Online First: 20220727]
- 7 7. Johnson AM, Brimhall AS, Johnson ET, et al. A systematic review of the
- 8 effectiveness of patient education through patient portals. *JAMIA Open*
- 9 2023;6(1):ooac085. doi: 10.1093/jamiaopen/ooac085 [published Online First:
- 10 20230118]
- 11 8. Wang S, Liu K, Shi Z, et al. Instruments for measuring patient health education
- 12 competence among nursing personnel: protocol for a COSMIN-based
- 13 systematic review. *BMJ Open* 2023;13(10):e072905. doi: 10.1136/bmjopen-
- 14 2023-072905 [published Online First: 20231006]
- 15 9. Lin LY, Wang RH. Patient Education Competence Scale for Registered Nurses in
- 16 Taiwan: Scale development and psychometric validation. *Jpn J Nurs Sci*
- 17 2017;14(2):117-25. doi: 10.1111/jjns.12141 [published Online First: 20160714]
- 18 10. Hwang HL, Kuo ML, Tu CT. Health education and competency scale: Development
- 19 and testing. *J Clin Nurs* 2018;27(3-4):e658-e67. doi: 10.1111/jocn.14116
- 20 [published Online First: 20171213]

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

11. Pueyo-Garrigues M, Pardavila-Belio MI, Whitehead D, et al. Nurses' knowledge, 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]

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 [published Online First: 20210312]

13. Martin-Delgado L, Goni-Fuste B, Monforte-Royo C, et al. A teaching role practicum during the COVID-19 for final year nursing students in Spain: A qualitative study. *J Prof Nurs* 2022;42:51-57. doi: 10.1016/j.profnurs.2022.06.005 [published Online First: 20220609]

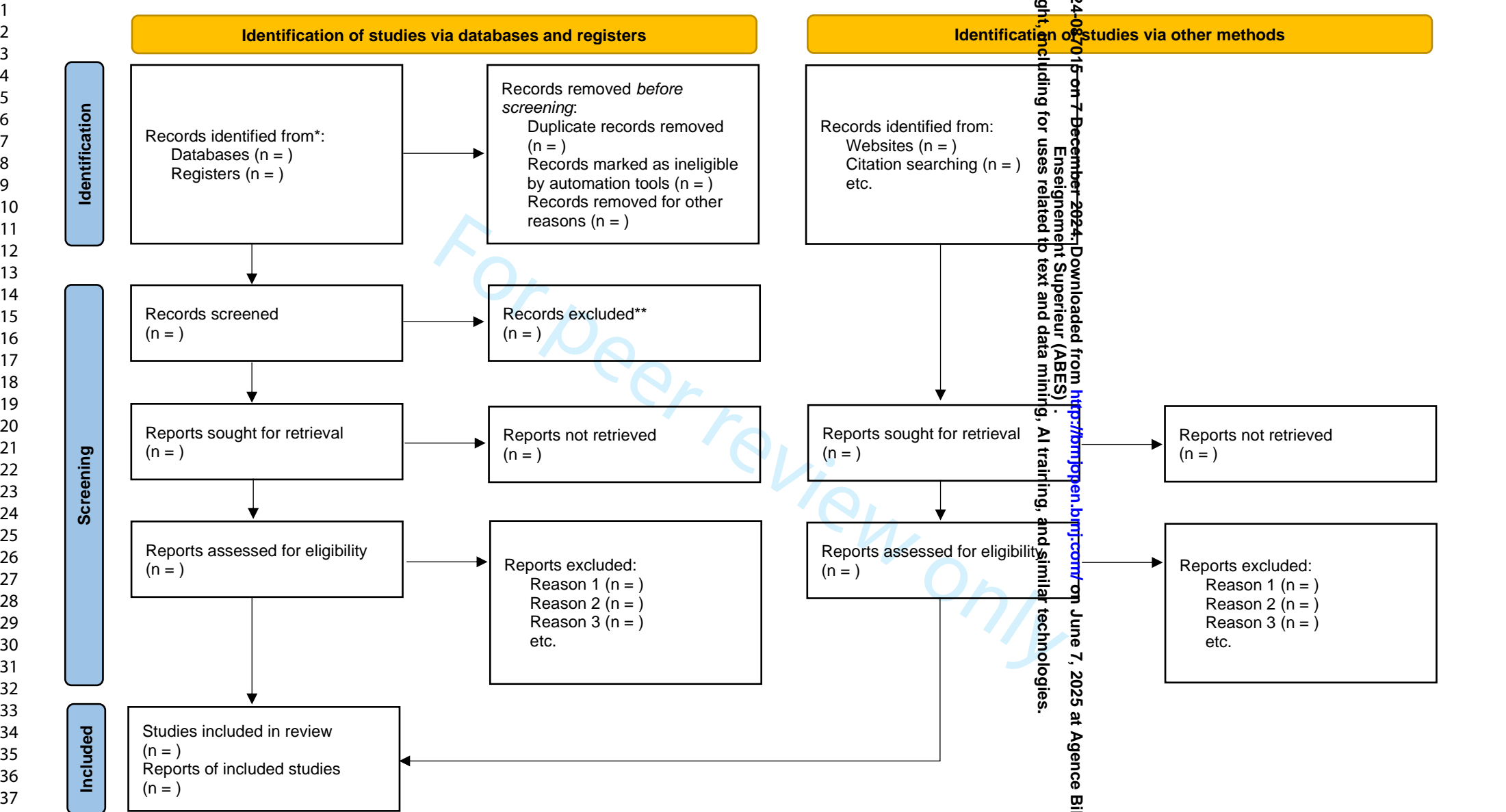
14. Dong X, Zhang Z, Zhang X, et al. Effects of an online training program on cardiovascular health behavior modification on nursing students' health education competency. *Nurse Educ Today* 2023;127:105829. doi: 10.1016/j.nedt.2023.105829 [published Online First: 20230425]

15. Sezer H, Orgun F. Effectiveness of standardized patient on patient education skills of nursing students - a pilot study. *J Pak Med Assoc* 2019;69(12):1848-54. doi: 10.5455/jpma.1590

16. Torkshavand G, Khatiban M, Soltanian AR. Simulation-based learning to enhance students' knowledge and skills in educating older patients. *Nurse Educ Pract*

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Ensignement Supérieur (ABES).

- 2020;42:102678. doi: 10.1016/j.nepr.2019.102678 [published Online First: 20191122]
17. Banayat A, Goyena KH, Valenzuela IL. EFFECTS IN EDUCATION COMPETENCY SELF-ASSESSMENT OF A BASIC HEALTH EDUCATION ONLINE COURSE FOR HEALTH PROFESSIONALS IN PEDIATRIC HEMATOLOGY-ONCOLOGY: A PILOT STUDY. *Pediatric Blood and Cancer* 2022;69:S530. doi: 10.1002/pbc.29952
18. Wang L, Wang Y, Wang X, et al. Effects of mind mapping based on standardized patient program in patient education among postgraduate nursing students in clinical setting. *BMC Med Educ* 2023;23(1):982. doi: 10.1186/s12909-023-04944-4 [published Online First: 20231220]
19. Peters MDJ, Marnie C, Tricco AC, et al. Updated methodological guidance for the conduct of scoping reviews. *JBIM Evid Implement* 2021;19(1):3-10. doi: 10.1097/xe.0000000000000277
20. Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med* 2018;169(7):467-73. doi: 10.7326/m18-0850 [published Online First: 20180904]
21. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Bmj* 2021;372:n71. doi: 10.1136/bmj.n71 [published Online First: 20210329]



*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

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

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. Search strategy for ERIC

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

Protected by copyright, including for uses related to text and data mining, AI training, and similar technologies. Ensignement Supérieur (ABES).

Table S1. The characteristics of included studies

Author(s)/year developed	Country	Type of study	Participants			Study aims	Key findings and conclusions
			Target population	Sample size	Setting		

Table S2. The extra characteristics of included studies

Author(s)/year developed	intervention strategies							outcomes measured	outcome assessment methods/measurement instruments
	teaching modalities	teaching objectives	teaching content	teaching methods	teaching duration and frequency	teaching media	teaching faculty		