

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Instruments for measuring patient health education competence among nursing personnel: Protocol for a COSMIN-based systematic review
<b>AUTHORS</b>	Wang, Shuyi; Liu, Ke; SHI, Zeya; Chen, Qirong; Tang, Siyuan

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Miren Idoia Pardavila-Belio Universidad de Navarra
<b>REVIEW RETURNED</b>	08-Mar-2023

<b>GENERAL COMMENTS</b>	<p>Although the study protocol is rigorous and the topic is relevant, it is not very novel. A systematic review with a very similar methodology has just been published. Ref:</p> <p>Eskolin, S. E., Inkeroinen, S., Leino-Kilpi, H., &amp; Virtanen, H. (2023). Instruments for measuring empowering patient education competence of nurses: Systematic review. <i>Journal of advanced nursing</i>, 10.1111/jan.15597. Advance online publication. <a href="https://doi.org/10.1111/jan.15597">https://doi.org/10.1111/jan.15597</a></p> <p>The only difference is that this protocol adds some databases, including Chinese ones. However, this is not expected to significantly increase the number of articles found.</p>
-------------------------	---

<b>REVIEWER</b>	alvisa palese Univ Udine
<b>REVIEW RETURNED</b>	07-Apr-2023

<b>GENERAL COMMENTS</b>	<p>The protocol is constructed and touches on an important topic worthy of attention. I was also able to verify its correspondence with what was reported in the PROSPERO database. The following suggestions emerge that could further improve its setting:</p> <p>(a) In the methodology there are errors in the citation of references: reference 21 and 22 are cited but reference 20 is not cited. (b) It is not clear in the inclusion criteria why only studies involving nurses or nursing students are included. In the background, the researchers reported a broader interest in healthcare professionals because it is not necessarily only nurses or nursing students who lead the patient education process. (c) In the case of systematic reviews, however, it does not emerge how the authors handled their references and whether they consulted them.</p>
-------------------------	---

<b>REVIEWER</b>	Larry Olsen A T Still University College of Graduate Health Studies
<b>REVIEW RETURNED</b>	25-Jun-2023

<b>GENERAL COMMENTS</b>	<p>This is an interesting protocol. The inclusion of two Chinese databases is interesting as well. I think you should explain that the work from these two databases would be presenter once the review has been conducted.I have offered additional comments in the attached file. I hope you find those comments helpful.</p> <p>The reviewer provided a marked copy with additional comments. Please contact the publisher for full details.</p>
-------------------------	---

**VERSION 1 – AUTHOR RESPONSE**

Reviewer: 1

Reviewer Name: Miren Idoia Pardavila-Belio  
Institution and Country: Universidad de Navarra

Dear Dr. Miren Idoia Pardavila-Belio, thank you very much for reviewing our manuscript. We have revised the manuscript according to all your suggestions. Please see our more detailed revisions in the Main Document-marked copy.

Although the study protocol is rigorous and the topic is relevant, it is not very novel. A systematic review with a very similar methodology has just been published.

Ref:

Eskolin, S. E., Inkeroinen, S., Leino-Kilpi, H., & Virtanen, H. (2023). Instruments for measuring empowering patient education competence of nurses: Systematic review. *Journal of advanced nursing*, 10.1111/jan.15597. Advance online publication. <https://doi.org/10.1111/jan.15597>  
The only difference is that this protocol adds some databases, including Chinese ones. However, this is not expected to significantly increase the number of articles found.

Response: Thank you for this important comment. Before we wrote this protocol, we also found the review you mentioned. However, there will be some differences between this review and our review. In the Chinese databases, we found eight eligible instruments which were not included in the review published in 2023. Based on your suggestion, we agree that we need to add some information about this ‘similar’ review. We have added a corresponding section in the introduction to explain.

Eskolin et al. conducted a review on instruments assessing nurses' competence in the empowerment of patient education.[22] However, in this review, the author did not give a clear and specific definition of ‘empowering patient education competence of nurses’. This may lead to an unclear research boundary. Their investigation encompassed not only instruments appraising nurses' PHEC but also instruments evaluating the quality of patient education provided by healthcare professionals. Furthermore, they included tools for measuring nurses' attitudes toward patient education. Considering the importance of nursing personnel in patient health education, and to ensure a more distinct scope and targeted content, our study will focus specifically on the PHEC measurement instruments, which are designed specifically for nursing personnel, including both nurses and nursing students. Furthermore, in our review, we will incorporate Chinese databases, unveiling more qualified instruments that align with our stringent criteria. (on page 6, line 5-17.)

Reviewer: 2

Reviewer Name: alvisa palese

Institution and Country: alvisa palese

Dear Dr. alvisa palese, thank you very much for reviewing our manuscript. We have revised the manuscript according to all your suggestions. Please see our more detailed revisions in the Main Document-marked copy.

- In the methodology there are errors in the citation of references: reference 21 and 22 are cited but reference 20 is not cited.

Response: Thank you for your kindly reminder. We have checked and revised the errors. (on page 7, line 9-12.)

- It is not clear in the inclusion criteria why only studies involving nurses or nursing students are included. In the background, the researchers reported a broader interest in healthcare professionals because it is not necessarily only nurses or nursing students who lead the patient education process.

Response: Thank you for your comment. As the world's largest group of health professionals and the health professionals who have the closest contact with patients, nursing staff plays an important role in patient health education. However, in the introduction section, we inadvertently elaborated excessively on the significance of PHEC for health professionals, while inadequately addressing its importance for nursing personnel. This discrepancy resulted in a loss of focus and introduced ambiguity. To address this, we have revised the introduction section to distinctly expound upon the significance of PHEC specifically for nursing personnel. Taking into consideration the inclusive scope of the article, encompassing both nursing staff and nursing students, a deliberate revision has been undertaken in the title adjustment, transitioning from the initial term "nursing staff" to the more comprehensive descriptor "nursing personnel".

As the world's largest group of health professionals and the health professionals who have the closest contact with patients, nursing staff plays an important role in patient health education. Nurses often develop profound connections with their patients, rendering them optimal conveyors of health information and proponents of constructive behavioral transformations.[6] Their consistent and sustained patient interactions afford them an intimate grasp of individual needs, preferences, and hurdles, enabling the delivery of tailored patient health education that accommodates these divergent factors.[6,7] This education encompasses instructing patients on health preservation, preventive measures, and autonomous health management. Consequently, patients are empowered to make enlightened choices and enhance compliance with treatment regimens. Functioning as integral healthcare team members, nurses proficiently facilitate intercommunication among patients, physicians, and allied healthcare professionals.[8] Their adeptness at translating medical jargon and disseminating information empowers patients to comprehend medical language, thereby expediting the formulation and execution of efficacious treatment strategies.[7] Therefore, nurses have an integral and important role in patient health education. (on page 3,line 25, and page 4, line 1-16.)

PHEC is an essential professional competency for nursing staff and determines the quality of patient education.[11-14] However, in existing studies, the PHEC of clinical nurses is often the lowest-rated area of nursing competency.[15,16] Therefore, the development and strengthening of PHEC for nurses are extremely important to improve the quality of patient education, patient care, patient safety, and the development of nursing careers. In addition, we should pay attention to nursing students' PHEC because they are the primary reserve of the clinical nurse workforce. (on page 4, line 19-25, and page 5, line 1.)

- In the case of systematic reviews, however, it does not emerge how the authors handled their references and whether they consulted them.

Response: We have made this comment in the manuscript.

We will also search for and screen references of all eligible literature. (on page 8, line 10.)

Reviewer: 3

Reviewer Name: Larry Olsen

Institution and Country: A T Still University College of Graduate Health Studies

Dear Dr. Larry Olsen, we sincerely appreciate the thorough revisions you have made in the manuscript. We acknowledge and accept all of the language-related changes. Please see our more detailed revisions in the Main Document-marked copy. All pages and lines mentioned later are those we added in the "Main Document-marked copy".

- The inclusion of two Chinese databases is interesting as well. I think you should explain that the work from these two databases would be presenter once the review has been conducted.

Response: Thank you for your valuable suggestion. The incorporation of Chinese databases into our study is motivated by the aim to ensure a comprehensive, accurate, and diverse research approach. This strategic addition not only provides access to more nuanced information within specific contexts but also contributes to the heightened quality and inherent value of our research endeavors. We provided the search strategy for Chinese databases, and we will report the results of these two databases once the review has been conducted. See more details in Table S2 in Supplementary File 2.

- Introduction: Consider using "address" since you may not be able to "answer" the six questions you present.

Response: We sincerely thank you sincerely for your careful reading. In accordance with your suggestion, we have corrected the "address" into "answer". (on page 6, line 23.)

- Study screening: I suggest you include a reference for this.

Response: Thank you for your constructive suggestions. We have checked the literature carefully and added a reference into the Study screening part in the revised manuscript.

Covidence will be used to manage the references.[27] (on page 8, line 25.)

Reference:

27. Babineau J. Product review: Covidence (systematic review software). Journal of the Canadian Health Libraries Association/Journal de l'Association des bibliothèques de la santé du Canada 2014;35(2):68-71.

- Study screening: You need to add a title for this figure.

Response: Thank you and we have added a title "Flowchart of literature selection process" for the figure.

- Data extraction: You should use brackets inside the parentheses for all these types of designations.

Response: Thank you for your kindly reminder. We have checked and revised the errors. (on page 9, line 9-11.)

- Data extraction: What about the psychometric properties of the instruments, including how subscales (if any) were identified (e.g., factor analysis or other empirical process).

Response: We have extracted the results of the instrument's psychometric properties in Table S5 in Supplementary File 5, including content validity, structural validity, internal consistency, cross-cultural validity/measurement invariance, reliability, measurement error, criterion validity, hypothesis testing for construct validity, and responsiveness.

- Data extraction: This is partially addressed later when you mention Table s5, but consider the concept of scalogram analysis as an addition to this table.

Response: Thank you for your valuable suggestion. Nevertheless, it's worth noting that the majority of scales identified in our study were of the Likert Scale type, whereas Scalogram Analysis finds its application primarily in the context of Guttman Scales. Taking into account that this paper rests upon the COSMIN methodology and is constrained by its length, achieving a comprehensive extraction of every detail becomes impractical. As a result, the design of the data extraction form has been meticulously fashioned in unwavering conformity with the stringent COSMIN requirements.

- Data extraction: Should this be "age range?"

Response: Thank you for your valuable suggestion. In this context, the term "age" specifically pertains to the "mean of age." The initial phrasing indeed introduced ambiguity. Following your suggestion, we have replaced "age" with "mean of age". (on page 9, line 13.)

- Quality appraisal and Data synthesis: What are items 1 and 2 and what is the source of items 3 to 35? A reference (or references) would be appropriate.

Response: I apologize for any confusion that may have arisen from our presentation. The evaluation of distinct measurement properties entails a corresponding variety of assessment items. These items vary in quantity, with some properties being evaluated using three items, while others require the assessment of thirty-five, thirty-one, four, and various other quantities of items. It is noteworthy that these assessment items have been sourced from the COSMIN Risk of Bias checklist, accessible through the following link: [https://www.cosmin.nl/wp-content/uploads/COSMIN-RoB-checklist-V2-0-v17\\_rev3.pdf](https://www.cosmin.nl/wp-content/uploads/COSMIN-RoB-checklist-V2-0-v17_rev3.pdf).

In accordance with your suggestion, we have revised the "Each measurement property will be evaluated with 3 to 35 items" into "Each measurement property will be evaluated by different items provided by the COSMIN Risk of Bias checklist."

We carefully reviewed the literature and added references to the Quality appraisal and Data synthesis sections of the revised manuscript.

Each measurement property will be evaluated by different items provided by the COSMIN Risk of Bias checklist, and the items will be rated on a five-level score of 'very good', 'adequate', 'doubtful', 'inadequate', or 'not applicable.' [23,28] (on page 10, line 3-6.)

Reference:

23. Mokkink LB, Prinsen C, Patrick DL, et al. COSMIN methodology for systematic reviews of patient-reported outcome measures (PROMs). User manual. 2018;78(1):6-63. Available from: [https://www.cosmin.nl/wp-content/uploads/COSMIN-syst-review-for-PROMs-manual\\_version-1\\_feb-2018-1.pdf](https://www.cosmin.nl/wp-content/uploads/COSMIN-syst-review-for-PROMs-manual_version-1_feb-2018-1.pdf)

28. Mokkink LB, De Vet HC, Prinsen CA, et al. COSMIN risk of bias checklist for systematic reviews of patient-reported outcome measures. Qual Life Res 2018;27:1171-9. doi: 10.1007/s11136-017-1765-4.

- Quality appraisal and Data synthesis: A reference would be appropriate.

Response: Thank you for your constructive suggestions. We have checked the literature carefully and added references into the Quality appraisal and Data synthesis part in the revised manuscript.

Based on the 'the worst score counts' principle, each measurement property's overall methodological quality score is expressed by taking the lowest rating of any standard in the box.[23,29] (on page 10, line 6-8.)

Reference:

23. Mokkink LB, Prinsen C, Patrick DL, et al. COSMIN methodology for systematic reviews of patient-reported outcome measures (PROMs). User manual. 2018;78(1):6-63. Available from: [https://www.cosmin.nl/wp-content/uploads/COSMIN-syst-review-for-PROMs-manual\\_version-1\\_feb-2018-1.pdf](https://www.cosmin.nl/wp-content/uploads/COSMIN-syst-review-for-PROMs-manual_version-1_feb-2018-1.pdf)

29. Terwee CB, Prinsen C, Chiarotto A, et al. COSMIN methodology for assessing the content validity of PROMs—user manual. Amsterdam: VU University Medical Center. 2018. Available from: <https://cosmin.nl/wp-content/uploads/COSMIN-methodology-for-content-validity-user-manual-v1.pdf>

- Quality appraisal and Data synthesis: Again, a reference would be appropriate here.

Response: Thank you for your constructive suggestions. We have checked the literature carefully and added references into the Quality appraisal and Data synthesis part in the revised manuscript.

Subsequently, the two researchers will apply the updated criteria for good measurement properties alone to evaluate the reliability and validity of the instruments themselves, and the quality of the evidence will be graded using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach.[23,29] (on page 10, line 9-12.)

23. Mokkink LB, Prinsen C, Patrick DL, et al. COSMIN methodology for systematic reviews of patient-reported outcome measures (PROMs). User manual. 2018;78(1):6-63. Available from: [https://www.cosmin.nl/wp-content/uploads/COSMIN-syst-review-for-PROMs-manual\\_version-1\\_feb-2018-1.pdf](https://www.cosmin.nl/wp-content/uploads/COSMIN-syst-review-for-PROMs-manual_version-1_feb-2018-1.pdf)

29. Terwee CB, Prinsen C, Chiarotto A, et al. COSMIN methodology for assessing the content validity of PROMs—user manual. Amsterdam: VU University Medical Center. 2018. Available from: <https://cosmin.nl/wp-content/uploads/COSMIN-methodology-for-content-validity-user-manual-v1.pdf>

- A title is needed for this figure.

Response: Thank you and we have added a title "Flowchart of literature selection process" for the figure.

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	alvisa palese Univ Udine
<b>REVIEW RETURNED</b>	02-Sep-2023
<b>GENERAL COMMENTS</b>	The revision addressed my previous concerns and also that expressed by the other reviews. I only suggest to check now the consistency between this protocol and that registered on PROSPERO Kind regards

<b>REVIEWER</b>	Larry Olsen A T Still University College of Graduate Health Studies
<b>REVIEW RETURNED</b>	04-Sep-2023

<b>GENERAL COMMENTS</b>	You have done a nice job with this submission. In the attached file, I have included some additional comments for your consideration.  The reviewer provided a marked copy with additional comments. Please contact the publisher for full details.
-------------------------	---

### VERSION 2 – AUTHOR RESPONSE

Reviewer: 2

Reviewer Name: alvisa palese

Institution and Country: Univ Udine

Dear Dr. alvisa palese, Thank you so much for your time and great suggestions on the manuscript! Please see our more detailed revisions in the Main Document-marked copy. All pages and lines mentioned later are those we added in the “Main Document-marked copy”.

- The revision addressed my previous concerns and also that expressed by the other reviews. I only suggest to check now the consistency between this protocol and that registered on PROSPERO.

Response: Thank you for your valuable suggestion. Based on your suggestion, we checked the inconsistency between this Protocol and that registered on PROSPERO. We found two inconsistencies: 1. Review title; and 2. Funding. The following is an explanation of these two inconsistencies.

1. Review title: Taking into consideration the inclusive scope of the article, encompassing both nursing staff and nursing students, a deliberate revision has been undertaken in the title adjustment, transitioning from the initial term “nursing staff” to the more comprehensive descriptor “nursing personnel”.

2. Funding: In the PROSPERO registration, the Funding sources/sponsors were initially documented as “None.” However, it is important to note that during the course of the study, we secured pertinent funding support. Consequently, the Funding section in the protocol was subsequently revised to accurately reflect this development.

We have added a new supplemental table, and the inconsistency between this Protocol and the that registered on PROSPERO and the reasons for this are stated in the Supplementary Material Table S1.

We registered the protocol in the International Prospective Register of Systematic Reviews (PROSPERO, CRD42023393293). The inconsistency between this protocol and that registered on

PROSPERO and the reasons for this are shown in Table S1. (on page 6, lines 24-25, and page 7, line 1.)

Reviewer: 3

Reviewer Name: Larry Olsen

Institution and Country: A T Still University College of Graduate Health Studies

Dear Dr. Larry Olsen, we sincerely appreciate the thorough revisions you have made in the manuscript. We acknowledge and accept all of the language-related changes. Please see our more detailed revisions in the Main Document-marked copy. All pages and lines mentioned later are those we added in the "Main Document-marked copy".

- You have done a nice job with this submission. In the attached file, I have included some additional comments for your consideration.

Response: Thank you very much for your positive comment of this systematic review and for taking the valuable time to review it. Please see our more detailed revisions in the Main Document-marked copy.

- Abstract: Almost always two words.

Response: Thank you for your suggestion. Following your suggestion, we have checked the full text and replaced "healthcare" with "health care".

For example,

Health education, as a crucial strategic measure of disease prevention and control in the 21st century, has become an important part of health care. (on page 2, line 1.)

- Introduction: This could become controversial as there is a health education profession that may include nurses. You need to be careful of the terminology you use.



Response: Thank you for your suggestion. Based on your suggestion, we have replaced “health educators” with “nursing personnel”. (on page 5, line 4.)

- Introduction: Address may be a better word to use.

Response: Thank you for your suggestion. In accordance with your suggestion, we have changed “answer” to “address”. (on page 6, line 12.)

- Inclusion criteria: Are you limiting the articles to the English language? This needs to be specified.

Response: Thank you for your valuable suggestions. In response to your suggestion, we have added a relevant section to the Inclusion criteria.

We will limit the included studies to those written in English and Chinese. (on page 7, lines 11-12.)

- Search strategy: OK, this addresses my prior comment but I suggest you mention Chinese at that point.

Response: Thank you for your valuable suggestions. We have added related content based on this comment.

We will limit the included studies to those written in English and Chinese. (on page 7, lines 11-12.)

- Search strategy: Not fully clear as stated.

Response: Thank you for your suggestion. Based on your suggestion we have revised the sentence.

The search time limit is from the library’s creation date to March 31, 2023. (on page 7, lines 23-24.)

- Quality appraisal and Data synthesis: Why this large difference? I suggest you use all 35 items for each instrument.

Response: Thank you for your suggestion. However, the COSMIN Risk of Bias checklist specifies that the number of evaluation items for each measurement property is fixed for each instrument: PROM development (35 items), Content validity (31 items), Structural validity (4 items), Internal consistency (5 items), Cross-cultural validity/Measurement invariance (4 items), Reliability (8 items), Measurement error (6 entries), Criterion validity (3 items), Hypothesis testing for construct validity (7 items), Responsiveness (13 items). It is noteworthy that these assessment items have been sourced from the COSMIN Risk of Bias checklist, accessible through the following link: [https://www.cosmin.nl/wp-content/uploads/COSMIN-RoB-checklist-V2-0-v17\\_rev3.pdf](https://www.cosmin.nl/wp-content/uploads/COSMIN-RoB-checklist-V2-0-v17_rev3.pdf).

Each measurement property will be evaluated by different items provided by the COSMIN Risk of Bias checklist, and the items will be rated on a five-level score of 'very good', 'adequate', 'doubtful', 'inadequate', or 'not applicable.' [23,28] (on page 9, lines 16-18.)

- References: Do not include a period at the end of the doi for the references.

Response: Thank you for your suggestion, we have deleted the period at the end of the doi for the references.

For example,

4. Siegel KR, Ali MK, Zhou X, et al. Cost-effectiveness of interventions to manage diabetes: has the evidence changed since 2008? *Diabetes Care* 2020;43(7):1557-92. doi: 10.2337/dci20-0017 (on page 13, lines 20-22.)

- References: Format adjustment needed.

Response: Thank you for your suggestion, we have adjusted the formatting of this reference.

References:

1. Organization WH. Health education: theoretical concepts, effective strategies and core competencies: a foundation document to guide capacity development of health educators. 2012 Available from: [https://apps.who.int/iris/bitstream/handle/10665/119953/EMRPUB\\_2012\\_EN\\_1362.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/119953/EMRPUB_2012_EN_1362.pdf?sequence=1) accessed September 11 2023. (on page 13, lines 10-14.)

- References: Format needs adjustment.

Response: Thank you for your suggestion, we have adjusted the formatting of this reference.

References:

16. Pueyo-Garrigues M, Whitehead D, Pardavila-Belio MI, et al. Health education: A Rogerian concept analysis. *Int J Nurs Stud* 2019;94:131-38. doi: 10.1016/j.ijnurstu.2019.03.005 (on page 15, lines 7-9.)

- References: Doi is missing.

Response: Thanks to your suggestion, we have added the doi for this reference.

References:

20. Mi Y, Wu D, Wei ZZ, et al. Research progress on evaluation tool for health education competency of nursing staff. *Chinese Nursing Research* 2020;34(11):1983-7. doi: 10.12102/j.issn.1009-6493.2020.11.023 (on page 15, lines 20-22.)

- References: Do not split the reference across pages.

Response: Thank you for your suggestion, we have adjusted the number of lines in the references to prevent page splitting.