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Instruments for measuring patient health education competence among nursing personnel: protocol for a COSMIN-based systematic review

Shuyi Wang ,[1] Ke Liu,[1] Zeya Shi ,[2] Qirong Chen ,[1,3] Siyuan Tang[1,3]

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[1]Xiangya School of Nursing, Central South University, Changsha, Hunan, China
[2]Department of Nursing, Hunan Provincial People's Hospital, Changsha, China
[3]Xiangya Center for Evidence-Based Practice & Healthcare Innovation: A Joanna Briggs Institute Affiliated Group, Changsha, Hunan, China

Correspondence to
Qirong Chen;
qirong.chen@csu.edu.cn and Siyuan Tang;
tsycongcong@126.com

ABSTRACT

Introduction Health education, as a crucial strategic measure of disease prevention and control in the 21st century, has become an important part of healthcare. As the main deliverers of patient health education, nursing personnel's patient health education competence (PHEC) has received much attention. Instruments for assessing the PHEC of nursing personnel have been developed internationally, but there is a lack of systematic reviews and evaluations of the psychometric properties of these instruments. To effectively select appropriate PHEC assessment instruments in specific contexts, a systematic and comprehensive review and evaluation of these measurement instruments are needed. The goal of this systematic review is to systematically evaluate the psychometric properties of existing PHEC instruments.

Methods and analysis In this study, eight databases will be searched between 1 March 2023 and 31 2023 to retrieve studies that include instrument(s) measuring the PHEC of nursing personnel. Two researchers will independently perform literature screening, data extraction and literature evaluation. In case of disagreement, a third researcher will be involved in the resolution. The measurement properties of PHEC assessment instruments will be systematically reviewed based on the consensus-based standards for the selection of health measurement instruments (COMSIN) methodology and guideline.

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 health education and/or patient education.

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STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The Preferred Reporting Items for Systematic reviews and Meta-analyses protocols (PRISMA-P) 2015 checklist and the Preferred Reporting Items for Systematic reviews and Meta-analyses (PRISMA) 2020 checklist will be used to guide the reporting of the protocol and systematic review, respectively.
⇒ The consensus-based standards for the selection of health measurement instruments (COSMIN) methodology will be used to evaluate the methodological quality of included studies on measurement properties of the instruments and the quality of included instruments.
⇒ The systematic review may fail to include relevant literature published outside of the searched databases.

INTRODUCTION

Health education has been identified by the WHO as one of the three crucial strategic measures of disease prevention and control in the 21st century, and it is the most economical and effective measure for improving public health.[1] Health education for patients can improve their understanding of their own health status and disease management measures, which can relieve patients' anxiety and improve their compliance and satisfaction with medical staff, thus improving their health status and quality of life.[2] These better patient outcomes could reduce the burden of disease on patients and society at the economic level.[3 4] 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.[3 5] Nurses often develop profound connections with their patients, rendering them optimal conveyors of health information and proponents of constructive behavioural 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.

Patient health education competency (PHEC) refers to the specific qualities that health educators should have to conduct effective health education activities with patients.[9 10] 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.

Accurate measurement of PHEC is important because it can be used to assess the PHEC status of nursing personnel and to develop targeted strategies based on the nursing personnel's PHEC. Moreover, it can be used in research to assess the effectiveness of relevant PHEC interventions. Currently, relevant measurement instruments have been developed internationally: for example, a scale for measuring the PHEC of registered nurses developed by Lin and wang in 2017,[17] a PHEC competency assessment scale developed by Hwang *et al* based on a literature review and the Delphi method,[18] and a Spanish version of the nurse PHEC scale developed by Pueyo-Garrigues *et al*.[19] Although related instruments are available for assessing PHEC in nursing personnel, these evaluation instruments have been developed in different settings and their validation varies considerably, with none considered the gold standard.

In this study, we defined PHEC as the specific qualities that must be possessed by nursing personnel to provide health education to patients, including knowledge, skills, beliefs or attitudes, self-concept, personality qualities and motivation. Although there has been a review of PHEC measurement instruments for nursing staff, this review has some limitations on its rigour.[20] First, this review included both measurement instruments for PHEC and also systems for evaluating PHEC, which are different from measurement instruments. Second, this review did not systematically evaluate the measurement properties of instruments for measuring PHEC based on related guidelines. However, a systematic and comprehensive review of PHEC measurement instruments is crucial for guiding the selection of instruments and/or guiding the development and refinement of high-quality instruments in the future. The consensus-based standards for the selection of health measurement instruments (COSMIN) methodology provides resources to systematically review measurement instruments and evaluate them in terms of both methodological quality and quality of measurement properties to select instruments that are of high quality for study purposes and provide an evidence-based foundation for future high-level instrument development.[21] 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 both instruments appraising nurses' PHEC and also instruments evaluating the quality of patient education provided by healthcare professionals. Furthermore, they included tools for measuring nurses' attitudes towards 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. Thus, this study is designed to conduct a comprehensive and rigorous systematic review of PHEC assessment instruments based on the COSMIN methodology, to evaluate the measurement properties of these instruments, provide a reference for nursing personnel and researchers to accurately and effectively assess PHEC, and provide recommendations for researchers to develop and improve PHEC assessment instruments.

This systematic review will address the following questions: (1) What instruments are available for assessing the PHEC of nursing personnel? (2) What are the characteristics of these instruments? (3) What is the methodological quality of studies on the measurement properties of these instruments? (4) What are these instruments' measurement properties, interpretability and feasibility? (5) What are the similarities and differences between these instruments? (6) What are the knowledge and research gaps in the assessment of PHEC of nursing personnel?

METHODS

The COSMIN guideline for systematic reviews of PROMs will be used to guide the implementation of the systematic review. PRISMA-P 2015 checklist andPRISMA 2020 checklist will be used to guide the reporting of the protocol and systematic review, respectively.[21 23 24] The inconsistency between this protocol and that registered on PROSPERO and the reasons for this are shown in online supplemental table S1.

Inclusion and exclusion criteria of studies

Inclusion criteria

Studies will be included if they (1) address instrument(s) for measuring the PHEC of nurses or nursing students, (2) describe the processes of development and evaluation of

one or more measurement properties for eligible instrument(s), (3) discuss instruments designed to measure the PHEC of health professionals (the literature explicitly mentions that it applies to nursing personnel as well) and (4) have full-text availability. If full-text versions of the studies are not available online, the authors of these articles will be contacted, and articles for which valid information was not available after contacting the authors will be excluded. We will limit the included studies to those written in English and Chinese.

Exclusion criteria

Studies will be excluded if they are (1) not primary studies (eg, biographies, addresses and editorials) or are case studies, (2) reports that used the instruments only for outcome measurements, (3) secondary studies (eg, reviews and/or systematic reviews), or (4) duplicate published studies.

Search strategy

A systematic search will be performed between 1 March 2023 and 31 March 2023 in six English databases (ie, CINAHL, EMBASE, Ovid Medline, PubMed, PsycINFO and Web of Science) and two Chinese databases (ie, CNKI and WANFANG DATA). We include Chinese databases since the researchers speak Chinese as their native language. We will also search for and screen references of all eligible literature. The search time limit is from the library's creation date to 31 March 2023. A literature search will be conducted using a combination of subject terms and free words. The major search concepts will be nursing, health education, competence, instrument and measurement properties. Related comprehensive and sensitive search strategies developed by other researchers will also be used in this literature search, including (1) the search filter developed by the University of Oxford for finding PROMs,[25] (2) the sensitive PubMed search filter for measuring attributes developed by Terwee *et al*, and (3) corresponding search filters applicable to other databases.[26] We will examine results reported by nurses or nursing students, so the first filter will be adjusted appropriately (eg, we will remove those sections that are relevant to the quality of life and patient-reported outcomes). The search strategy constructed for PubMed is described in online supplemental table S2. The search strategy for the Chinese databases is shown in online supplemental table S3.

Study screening

Covidence will be used to manage the references.[27] First, duplicates from the eight databases will be removed with Covidence. After the initial screening, both researchers will independently review and screen titles, abstracts and full-text articles with the support of Covidence. In case of disagreement, a third researcher will be consulted to screen the literature. The screening processes of this study are shown in figure 1.

Data extraction

The two researchers will independently extract data from the included papers and resolve their differences through discussion. We will extract the data about the characteristics of the instruments (including instrument name, developer(s)/year developed, construct(s), targeted population, mode of administration, recall period, (sub) scale(s)/(number of items), response options, range of scores/scoring, original language and available translations; see online supplemental table S4, the characteristics of the included populations (including sample size, mean of age, gender, setting, country and language; see online supplemental table S5), the results on the psychometric properties (online supplemental table S6) and information about the interpretability (online supplemental table S7) and feasibility (online supplemental table S8) of the included instruments.

The term 'outcome measure instrument development' will be used instead of the original 'patient-reported outcome measure development' to more accurately reflect the inclusion of studies that examined outcomes reported by nurses or nursing students rather than patients.

Quality appraisal and data synthesis

Two researchers will independently assess the quality of eligible studies using the COSMIN Risk of Bias checklist, which is divided into three sections: content validity (instrument development and content validity), internal structure (structural validity, internal consistency and cross-cultural validity/measurement invariance) and other measurement properties (reliability, measurement error, criterion validity, hypothesis testing for construct validity and responsiveness).[21 23 28] 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] 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] 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] In case of disagreement, a third researcher will be consulted.

We will work using the following three steps. In the first step, two investigators will apply the COSMIN Risk of Bias checklist to evaluate the methodological quality of each eligible study individually.[28] The final consensus on the results of the methodological quality will be presented in online supplemental table S9,S9-1. In the second step, the updated criteria for good measurement properties will be applied to evaluate the quality of evidence for each measured property, and the evaluation results will

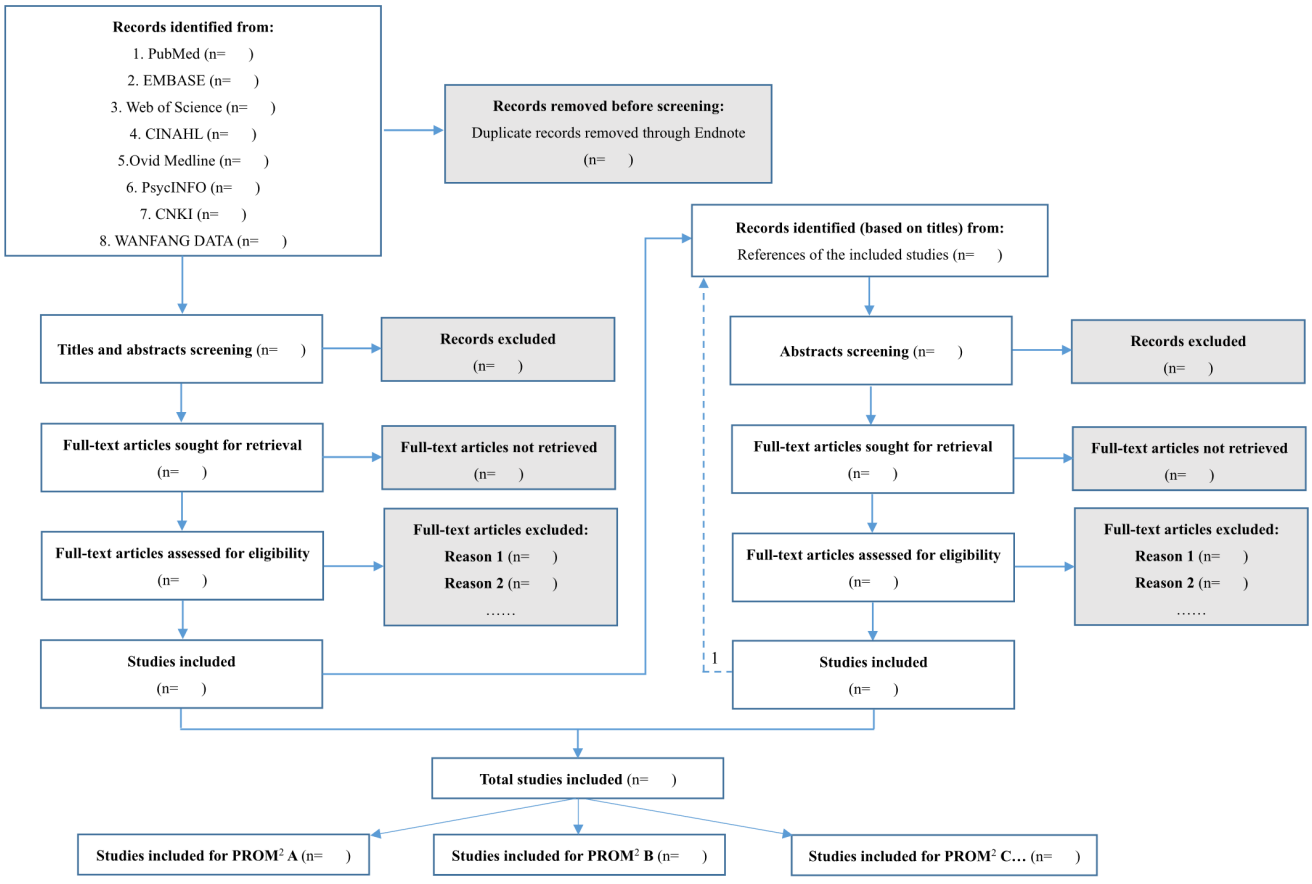

Figure 1. Flowchart of literature selection process

Note: 1. References of all included studies will be manually screened until no eligible studies can be identified.

2. PROM: patient-reported outcome measure.

Figure 1 Flowchart of literature selection process.

be shown in online supplemental table S6,S6-1.[23 29] This section mainly evaluates the strengths and weaknesses of the measurement properties. Among these, the quality of content validity will be evaluated according to the COSMIN methodology for content validity in three aspects: the relevance, comprehensiveness and comprehensibility of items, which can be 'sufficient (+)', 'insufficient (−)', 'indeterminate (?)' or 'inconsistent (±)'.[29 30] The quality of the remaining measurement properties (structural validity, internal consistency, cross-cultural validity, measurement invariance, reliability, measurement error, criterion validity, construct validity and responsiveness) will be evaluated by applying the COSMIN quality criteria, which can be 'sufficient (+)', 'insufficient (−)' and 'indeterminate (?)'.[23] The corresponding results will be reported in the rating columns of online supplemental table S6, and the results of rating content validity will be presented separately in online supplemental table S6-1 . In the third step, a modified GRADE approach will be used to rate the quality of the above evidence, reflecting the level of confidence in the quality of the evidence. To evaluate the content's validity, three of these factors are applicable: risk of bias, inconsistency and indirectness.[29] Assuming that the level of evidence quality for each of the remaining measurement properties is high, the quality of the evidence will be downgraded by considering the following factors: risk of bias, inconsistency, imprecision and indirectness.[23] The quality of evidence will be divided into four levels: 'high', 'moderate', 'low' or 'very low'.[21 23] The corresponding results will be displayed in online supplemental table S10. Two investigators will independently grade and cross-check the results. In case of disputes, final decisions will be made in consultation with the third investigator.

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 health education and/or patient education.

DISCUSSION

To the best of our knowledge, this will be the first COSMIN-based systematic review of PHEC assessment instruments for nursing personnel, which will be reported following

the Preferred Reporting Items for Systematic Reviews and Meta-analyses protocols (PRISMA-P) 2020 checklist. This systematic review will provide a comprehensive rating of the level of evidence for each measurement property of the PHEC assessment instruments, which will be based on an evaluation of the measurement properties of all included instruments and the methodological quality of the studies. Through this study, we will be able to develop recommendations on the use of existing qualified instruments in clinical practice and research that could assist nursing personnel and researchers in the accurate and valid assessment of PHEC. This review may provide an evidence-based foundation for the development, design, validation and use of future instruments by identifying problems in instrument development and validation and therefore help researchers to develop and improve these instruments.

Contributors All authors have read and agreed to the published version of the manuscript. Conceptualisation: QC, ST and SW; methodology: QC, ST and ZS; data curation: QC, SW and KL; writing—original draft preparation: SW, KL and QC; writing—review and editing: QC, ST and ZS; supervision: QC and ST.

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Competing interests None declared.

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ORCID iDs
Shuyi Wang http://orcid.org/0000-0003-4436-9101
Zeya Shi http://orcid.org/0000-0002-9291-6205
Qirong Chen http://orcid.org/0000-0003-1908-290X

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