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REVIEW

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Instruments for measuring empowering patient education competence of nurses: Systematic review

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Abstract

Aim: This review aimed to identify validated self-reported instruments used to measure nurses' competence or attribute(s) of competence in empowering patient education, to describe their development and main content and critically appraise and summarize the quality of the instruments.

Design: Systematic review.

Data Sources: Electronic databases of PubMed, CINAHL and ERIC were searched from January 2000 to May 2022.

Review Methods: Data was extracted following predetermined inclusion criteria. With the support of the research group, two researchers performed data selection and appraised the methodological quality using the COnsensus-based Standards for the selection of health status Measurement INstruments checklist (COSMIN).

Results: A total of 19 studies reporting 11 instruments were included. The instruments measured varied attributes of competence and the contents were heterogenous reflecting the complex nature of both empowerment and competence as concepts. Overall, the reported psychometric properties of the instruments and methodological quality of the studies were at least adequate. However, there was variation in the testing of the instruments' psychometric properties and lack of evidence limited the evaluation of both the methodological quality of the studies and quality of instruments.

Conclusion: The psychometric properties of the existing instruments assessing nurses' competence in empowering patient education need to be tested further, and future instrument development should be built on a clearer definition of empowerment as well as on more rigorous testing and reporting. In addition, continued efforts to clarify and define both empowerment and competence on the conceptual level are needed.

Impact: Evidence on nurses' competence in empowering patient education and its valid and reliable assessment instruments is scarce. Existing instruments are heterogenous and are often missing proper testing of validity and reliability. These findings contribute to further research on developing and testing the instruments of competence in empowering patient education and strengthening nurses' empowering patient education competence in the clinical practice.

KEYWORDS
educational competence, empowerment, health education, instruments, patient education, registered nurses

1 | INTRODUCTION

Patient education is central part of nurses' professional competence (International Council of Nurses (ICN), 2020; World Health Organization (WHO), 2020). As a core aspect of modern patient education (Forbes et al., 2018; Hwang & Kuo, 2018; Jotterand et al., 2016), empowerment is related to many positive outcomes, including increased health (e.g., Kuo et al., 2018) and health-related quality of life (e.g. Koekenbier et al., 2016; Kuo et al., 2018). The importance of patient empowerment is further emphasized as patients are increasingly expected to take more control over their health and care (Bonsignore et al., 2015; Menichetti et al., 2016; World Health Organization, 2018). For delivering empowering education, nurses need to have specific educational competence (e.g., Svavarsdóttir et al., 2016). However, empowering patient education is a complex intervention and the lack of appropriate education for nurses and their inadequate competence are recognized challenges in its realization (e.g. Agner & Braun, 2018).

Further strengthening of nurses' competence in empowering patient education calls for valid and reliable instruments to assess it. Thus, this review was made to summarize existing knowledge and assess the properties of instruments measuring nurses' competence in empowering patient education to support further research and practices.

1.1 | Background

Nurses' competence has been widely researched (Flinkman et al., 2017; Meretoja & Leino-Kilpi, 2001; Watson et al., 2002; Yanhua & Watson, 2011). In instruments measuring nurses' generic competence, educational competence is often acknowledged as part of competence in communication and/or patient-centred care, and rarely its own area of competence (Al Jabri et al., 2021). It is known that competence is contextual and individual nurses may be highly competent in a certain area while lacking competence in another (Garside & Nhemachena, 2013). Thus, it is important to investigate competence in specific contexts.

1.1.1 | Competence

Competence is a widely used and multidimensional concept with many definitions (e.g., Garside & Nhemachena, 2013; Watson et al., 2002; Yanhua & Watson, 2011). This review followed a holistic view of competence, in which competence is defined by different attributes. Most commonly, these attributes include knowledge, skills, and attitudes, but depending on the definition they may also include abilities, values, judgements, or performance. (e.g., Watson et al., 2002; Yanhua & Watson, 2011.) As the aim of this study was not to define competence but to form a comprehensive understanding of the existing instruments measuring nurses' competence in empowering patient education, both competence and its most used attributes were included in this study.

1.1.2 | Patient education

Patient education is a planned educational process including four components: assessment of patient's existing knowledge, knowledge structure and knowledge needs, planning by setting educational objectives, implementation of learning strategies and evaluation of the patient's knowledge or behaviour (Bastable, 2019; Health Care Education Association (HCEA), 2021). Health education is promotion of health through educational processes (Hwang & Kuo, 2018). As health is as important to people with and without health problems these educational forms have similar theoretical principles. Every patient educational action has the aim to improve the health of the patient—thus every patient education action is also a health education action, and these concepts are often used interchangeably. (Hwang & Kuo, 2018; Jotterand et al., 2016.) For example, HCEA (2021) guideline states that patient education should be planned to engage the patient with "combination of verbal and written health education". In this study, the interchangeable use of these concepts was acknowledged: all articles using either patient or health education were included in this review if they referred to individual educational process supporting the empowerment of an adult with a health problem.

1.1.3 | Empowerment and empowering patient education

Empowerment is a complex concept and consensus of the definition has not yet been reached. Thus, multiple variations of the concept exist in both theory and practice (Halvorsen et al., 2020) and to avoid confusion, the concept should be clearly described (Pekonen et al., 2020). This study does not measure empowerment as an outcome but investigates nurses' competence in empowering patient education. Thus, in this study, empowerment in patient education involves recognizing and supporting empowerment as the patient's individual ability to make informed choices and better control their health problem so to become empowered (Leino-Kilpi et al., 1999).

2 | THE REVIEW

2.1 | Aims

This systematic literature review had three aims: (1) identify validated self-reported instruments measuring nurses' competence or attribute(s) of competence in empowering patient education; (2) describe the development and main content of the instruments; (3) critically appraise and summarize the methodological quality and quality of the instruments following COSMIN protocol. Thus, the research questions were as follows: (1) what instruments exists for measuring nurses' competence in

empowering patient education? (2) How were the instruments developed and what is their content? (3) What is the quality of the instruments?

2.2 | Design

A systematic review using the protocol by the Consensus based Standards for the selection of health Measurement INstruments (COSMIN) panel (Mokkink et al., 2018; Prinsen et al., 2018; Terwee et al., 2018).

2.3 | Search methods

The electronic databases PubMed, CINAHL and ERIC were systematically searched for studies published from 1 Jan 2000 until 19 May 2022.

The final strategy as used in PubMed was (nurse*[Title/Abstract] OR "Nurses"[Mesh]) AND (competenc*[Title/Abstract] OR "educational competenc*" OR "pedagogical competenc*" OR "clinical competence*" OR "Clinical Competence"[Mesh] OR "professional competence*" OR "Professional Competence"[Mesh] OR skill* OR abilit* OR knowledge* OR value* OR judgement* OR attitude* OR performance*) AND ("patient education*"[Title/Abstract] OR "patient teaching*"[Title/Abstract] OR "patient counsel*"[Title/Abstract] OR "health education*"[Title/Abstract] OR "health teaching*"[Title/Abstract] OR "health counsel*"[Title/Abstract] OR [Title/Abstract] OR "Patient Education as Topic"[Mesh] OR "Health Education"[Mesh]) AND (instrument*[Title/Abstract] OR scale*[Title/Abstract] OR score*[Title/Abstract] OR questionnaire*[Title/Abstract] OR tool*[Title/Abstract]). Patient empowerment was often depicted in the main text of the articles instead of titles or abstracts. Thus, the requirement for the instruments to align with empowerment framework was included in the inclusion criteria to avoid pre-excluding important articles.

The inclusion criteria in this review were:

(1) described instrument measuring nurses' competence or an attribute(s) of competence in empowering patient education; (2) test(s) used for instrument validation were described; (3) instruments were developed for registered nurses in adult healthcare and reported in empirical studies; (4) published in peer-reviewed journals in the English language.

The studies were separately screened by two researchers (SE/HV). If patient empowerment was not recognized as at least one of the aims, the education was not considered to be empowering and the article was excluded from the review. In this phase, articles were also assessed on their use of patient and/or health education concepts to confirm that these aligned with the set inclusion criteria. The final selection of articles was done through discussions in the research group until an agreement was reached.

2.4 | Search outcome

The search strategy identified 4775 articles. After removing duplicates (by Mendeley), 4185 papers were considered. Of these, 40 articles were considered eligible to be assessed by full text based on title and abstract. Of these, 18 articles met all the chosen criteria and were included in the final review. One additional article (1) was added after the manual screening of references of the included articles. Therefore, the final sample included 19 research articles as shown in the Modified PRISMA flow diagram (Figure 1) with a total of 11 instruments.

2.5 | Data abstraction

With the support of the research group two researchers (SE/HV) chose the descriptive details for the instruments, charted then by one researcher (SE). The details were: instrument name, author(s), year, target population and sample size, names of the subscales if any, number of items and scale of the response (Table 1). In addition, the development process (Table 2) and competence attributes represented of each instrument (Table 3) were charted in their own tables.

2.6 | Quality appraisal

Following COSMIN standards, the instruments were assessed from two distinct viewpoints: methodological quality (MQ) of the studies and quality of the instrument (QI) (Mokkink et al., 2018; Terwee et al., 2012).

2.6.1 | Methodological quality of the studies

The MQ assessment of The COSMIN Risk of Bias checklist consists of nine standards divided into three steps (Mokkink et al., 2018): (1) *content validity* (development of the instrument, content validity); (2) *internal structure* (structural validity, internal consistency, cross-cultural validity/measurement invariance); (3) *remaining measurement properties* (reliability, measurement error, criterion validity, hypotheses testing for construct validity, responsiveness).

In COSMIN checklist, *content validity* is seen as the most important aspect of instrument validation (Prinsen et al., 2018; Terwee et al., 2018). The final rating per measurement property was defined by assessing the standards for that property and using the "worst score counts" principle. (Mokkink et al., 2018; Prinsen et al., 2018; Terwee et al., 2012, 2018.) Two researchers (SE/HV) independently assessed how the included studies met the MQ standards in these properties using the four-point rating scale (*very good*, *adequate*, *doubtful*, *inadequate*) by Mokkink et al. (2018). The final ratings were agreed in the research group.

2.6.2 | Quality of the instrument

The quality of each property of the instrument was rated with the criteria of Prinsen et al. (2018) following the same nine standards as the methodological quality (Mokkink et al., 2018). Rating was done

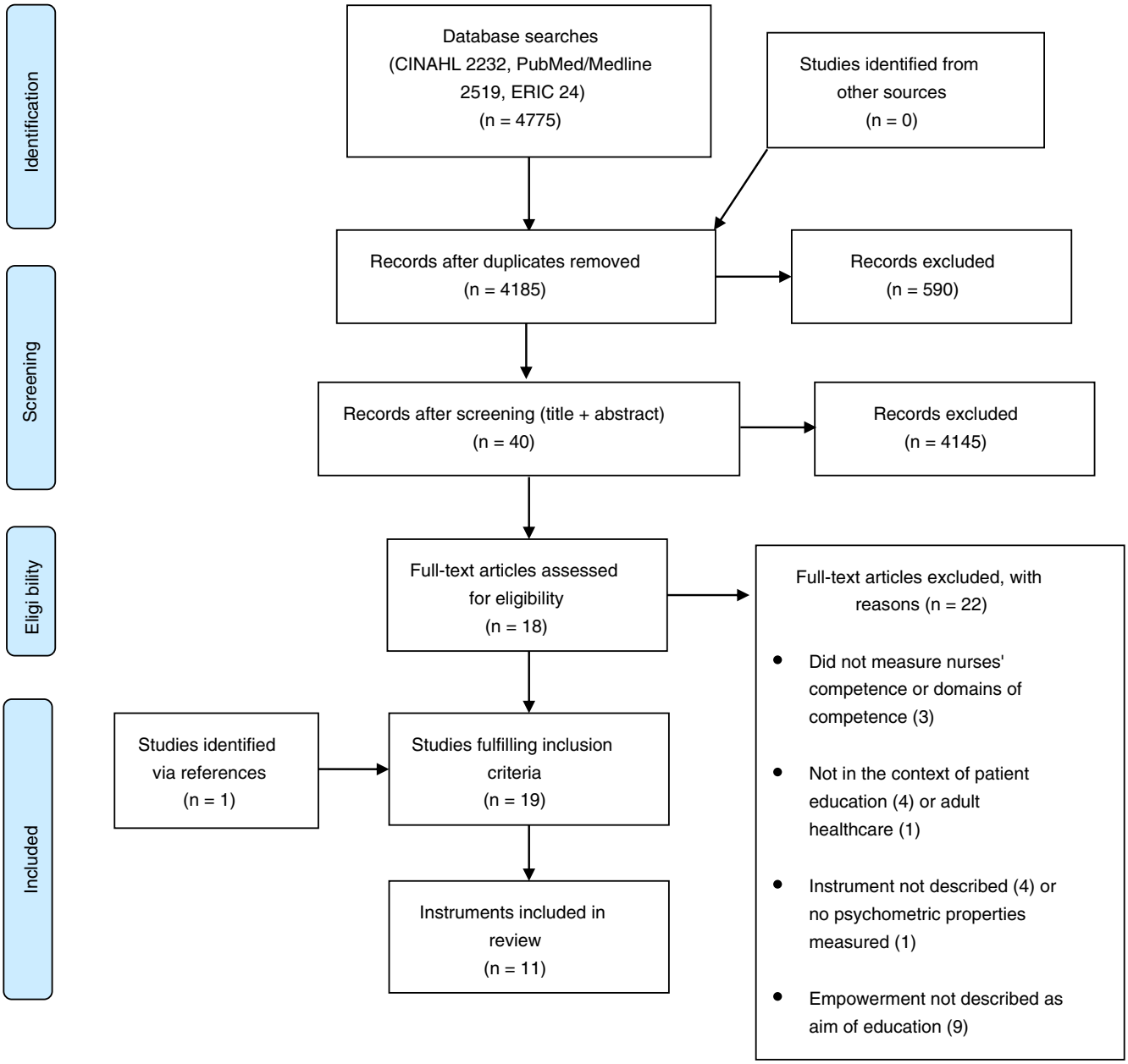

FIGURE 1 Modified PRISMA flow diagram (Page et al., 2021).

for each property independently by two researchers (SE/HV). Any difference in the evaluation was resolved in the research group.

2.7 | Synthesis

The quality of the instrument was established by summarizing the results. Then results were compared against criteria to see if it was sufficient (+), insufficient (−), inconsistent (±) or indeterminate (?). (Prinsen et al., 2018.) Finally, the quality of evidence was graded for each measurement property by using the GRADE approach (high, moderate, low or very low quality) (Mokkink et al., 2018; GRADE Handbook, 2013).

3 | RESULTS

In the data, a total of 11 instruments for measuring nurses' competence or competence attribute in empowering patient education were included (Table 1).

The articles were from Finland (n = 4; Johansson et al., 2002; Kettunen et al., 2006; Kääriäinen & Kyngäs, 2010; Eloranta et al., 2016), Greece (n = 1; Copanitsanou et al., 2019), Indonesia (n = 2; Nurhayati, Praneed, et al., 2019; Nurhayati, Songwathana, et al., 2019), Iran (n = 2; Ghorbani et al., 2014; Garshasbi et al., 2016), Republic of Korea (n = 2, Jung & Roh, 2020; Jung & Roh, 2021), Spain (n = 1; Pueyo-Garrigues et al., 2020), Sweden (n = 3; Bergh et al., 2012, 2014, 2015) and Taiwan (n = 2; Lin & Wang, 2017; Hwang et al., 2018). In addition, two of the

TABLE 1 Characteristics of the measurement instruments.

Instrument	Study (year)	Measurement aim	Participants	Content and/or subscales (items)	Response scale
Empowering Patient Education from the point of view of Nurses (EPNURSE)	Johansson et al. (2002) Eloranta et al. (2016) Charalambous et al. (2018) Klemetti et al. (2018) Copanitsanou et al. (2019)	Assess nurses' educational skills and practices in empowering patient education.	$n = 56$[a] nurses Comparative study between 2001 ($n = 56$ nurses) and 2010 with $n = 51$ nurses $n = 317$[a] (nurses 244/77%, assistant nurses 44/14%) from seven different countries	Educational skills of a nurse (5), evaluation of learning preferences and needs (3), setting of learning goal (3), use of educational methods (8), evaluation of learning outcomes (6), content of patient education (20) *Scale further developed between studies*. Basis of skills and practices (10), skills (5), practices and evaluation (22), methods, materials, and timing (23), content of patient education (23).	4-point Likert scale 1 = Good to 4 = Poor OR 1 = every patient to 4 = none of patients 4-point Likert scale Skills: 1 = Good to 4 = Poor Practises: 1 = Great extent to 4 = Not at all Practises and evaluation: 1 = For all patients to 4 = For no patients
Empowering Speech Practices Scale (ESPS)	Kettunen et al. (2006)	Assess the empowerment of counselling discussion for use in nursing practice	$n = 127$ one-on-one counselling sessions between a nurse and a patient	Total of 44 items in six clusters: setting expectations for discussion, offering individualized information and advice, facilitating reflection, constructing a positive atmosphere, respecting, and bringing up the patient's competence concerning health and the patient's assertiveness. Separate versions to nurse and patient, meant to be completed post-counselling.	3-point (Yes/No/Ambiguous)
Quality of patient education	Kääriäinen and Kyngäs (2010)	Assess the quality of patient education by measuring health personnel's views on patient education resources and implementation.	$n = 1418$ (nurses 846/93%, physician 68/7%)	Patient education resources: knowledge of treating an illness, knowledge of the patient's condition after treatment, knowledge of the impact the illness has on the patient's everyday life, interaction skills, skills to support self-care, attitudes, command of patient education methods and possibilities for patient education. Patient education implementation: patient-centred and interaction. (In total 77 items, number of items in subscales not separated in description)	5-point Likert scale 1 = Poor to 5 = Excellent In methods also: Do not use OR 4-point Likert scale 1 = Strongly disagree to 4 = Strongly agree

TABLE 1 (Continued)

Instrument	Study (year)	Measurement aim	Participants	Content and/or subscales (items)	Response scale
Nurse Patient-Education questionnaire (NPEQ)	Bergh et al. (2012) Bergh et al. (2014) Bergh et al. (2015) Jung and Roh (2020) Jung and Roh (2021)	Describe the nurses' perceptions of conditions for patient education work, relevant for different care settings.	*n* = 701 nurses working in primary care (*n* = 189), municipal care (*n* = 297) and hospital care (*n* = 215). n = 204 nurses working in 27 haemodialysis units. *n* = 262 nurses working in haemodialysis units.	Nurses' beliefs and knowledge (11), education environment (7), health care organization (11), interdisciplinary cooperation and collegial teamwork (9), and patient education activities (9) Total of 33 items in five domains of beliefs and knowledge on education environment (1), health care organization (2), interdisciplinary cooperation (3), collegial teamwork (4), and patient education activities (5)	5-point Likert scale 1 = Almost never/never to 5 = Almost always/always OR 1 = Strongly disagree to 5 = Strongly agree 2-point (Yes/No) Open-ended questions
Attitudes on barriers and facilitators to patient education	Ghorbani et al. (2014)	Describe the attitudes of nurses and nursing students on barriers and facilitators to patient education.	*n* = 175 (nurses 96/54,9%, nursing students 79/45,1%)	Level of performance in patient education activities (4), and facilitators (8) and barriers (26) to patient education	4-point Likert scale 1 = Never to 4 = Always OR 1 = Very low 4 = Very high
Knowledge, attitude, and practice of Health-Care Workers regarding patient education	Garshasbi et al. (2016)	Describe the quality, knowledge and attitude of HCWs in patient education.	*n* = 79	Knowledge (16), attitude (6) and practice (2)	Which is correct, with 4 choice options to choose 2-point (Yes/No)
Patient Education Competence scale for Registered Nurses (PECS-RN)	Lin and Wang (2017) Jung and Roh (2021)	Measure the competency of registered nurses to teach patients.	*n* = 133 nurses working in medical wards (69.2%), critical care units (17.3%) and another fields (13.5%) like operating rooms, outpatient departments and haemodialysis rooms.	Assessing patients' needs and problems (4), developing patient education plans (7), applying patient education methods and strategies (3), creating an appropriate learning atmosphere (3), possessing professional practise competence (3), evaluation and feedback (4)	7-point Likert 1 = No ability to 7 = Fully capable
Health Education Competency Scale (HECS)	Hwang et al. (2018)	Measure competency in conducting health education.	*n* = 457 (*n* = 292 senior nursing students at two nursing schools and *n* = 165 clinical nurses at a medical centre).	Assessment (4), pedagogy (5), motivation (3) and empowerment (6).	7-point Likert scale 1 = Lowest to 7 = Highest
Quality of Discharge Teaching Scale (QDTS)	Nurhayati, Praneed, et al. (2019) Nurhayati, Songwathana, et al. (2019)	Examine the perception of surgical nurses toward the adequacy of content coverage and appropriateness of teaching methods.	*n* = 118 nurses *n* =	Content (12) and delivery (15)	11-point Likert scale 0 = None to 10 = Great

TABLE 1 (Continued)

Instrument	Study (year)	Measurement aim	Participants	Content and/or subscales (items)	Response scale
Patient education performance	Jung and Roh (2020)	Identify factors influencing the patient education performance among nurses	$n = 204$ nurses working in 27 haemodialysis units.	No subscales (19)	4-point Likert scale 1 = Poor to 4 = Excellent
Nurse Health Education Competence Instrument (I-CEpSE)	Pueyo-Garrigues et al. (2020)	Test the knowledge, skills, and personal attributes necessary for competent health education practice	$n = 458$ nurses from different clinical departments/services	Multidimensional inventory with three self-reported scales. 1) Cognitive domain scale (23) examining specific knowledge about health and its determinants, health education, pedagogical resources, and techniques. 2) Psychomotor domain scale (26) exploring nurses' personal social and educational skills. 3) Attitudinal and affective domain scale (9) assessing personal attributes related to health education practice.	5-point Likert scale 1 = Very low to 5 = Very high OR 1 = Completely disagree to 5 = Completely agree

aOnly sample using the measurement reported in this review, samples (e.g. patients, significant others) that did not use the measurement excluded from the table.

articles were done as a collaboration between six countries, which were Cyprus, Finland, Greece, Iceland, Lithuania, Spain, and Sweden (Charalambous et al., 2018; Klemetti et al., 2018).

Six instruments were used only in the local language and no translation to English was made during the study. The exceptions were the instruments EPNURSE (Johansson et al., 2002), ESPS (Kettunen et al., 2006), NPEQ (Bergh et al., 2015), PECS-RN and QDTS (Nurhayati, Praneed, et al., 2019; Nurhayati, Songwathana, et al., 2019). The EPNURSE instrument was translated into English, Greek, Icelandic, Lithuanian, Spanish and Swedish (Klemetti et al., 2018). NPEQ was translated into English and Korean (Jung & Roh, 2020, 2021). QDTS was developed in English and then translated into Indonesian (Nurhayati, Praneed, et al., 2019; Nurhayati, Songwathana, et al., 2019).

Additionally, ESPS was translated into English and Portuguese (Borges Rodrigues et al., 2021). However, following the set inclusion criteria, the Portuguese version of ESPS was not included in this review as it was adapted for use in family health education and not in the context of adult healthcare.

3.1 | Development and content of the instruments

The most used form of theoretical background for the instruments was a literature review whereas expert panel was most often used as a method of content validation (Table 2). Most development processes included Content Validity Index (CVI) as well as some form of pre-testing of the instrument.

A varied spectrum of competence attributes was identified in the instruments (Table 3). Performance was the most often measured attribute. The most varied competence attributes were measured in the Quality of Patient Education Scale (Kääriäinen & Kyngäs, 2010), NPEQ (Bergh et al., 2012, 2014, 2015; Jung & Roh, 2020, 2021), PECS-RN (Lin & Wang, 2017), HECS (Hwang et al., 2018) and I-CEpSE (Pueyo-Garrigues et al., 2020).

3.2 | Methodological quality of the studies

Of the MQ standards, *content validity* assessment was found in all studies. However, none of the studies included all nine of the COSMIN standards (Table 4). Standards were rated on a four-point rating scale (*very good*, *adequate*, *doubtful*, *inadequate*) according to Mokkink et al. (2018).

3.2.1 | Content validity

In this review, MQ of *content validity* included both the development of the instrument and the factual content validity process. In comparison to COSMIN standards, the most common factors affecting *content validity* rating were lack of detail in the description of the content validity process and the relatively small size of the expert panels (Hwang et al., 2018; Jung & Roh, 2020; Lin & Wang, 2017;

TABLE 2 Development of the instruments.

Instrument (country)	Theoretical background	Validation process	CVI	Pre-test
EPNURSE (Finland)	Literature review	Expert panel of seven (2 university-based researchers, 2 polytechnic nurse educators, 3 hospital directors of nursing)	-	Originally tested with 30 nurses. Translated and modified version tested with 12 nurses in each country participating in study reported in 2018.
ESPS (Finland)	Conversation analytic study	Interview with 5 patients and 5 nurses who used the questionnaire to assess their counselling session	-	Tested on 4 patients in a hospital ward.
Quality of patient education (Finland)	Literature review	Evaluation by 26 nursing professionals (2 experts of nursing, 3 experts of nursing science and 21 nursing science students who were registered nurses)	+	Tested on 109 professionals consisting of both nurses and physicians from one Finnish university hospital in 2003.
NPEQ (Sweden)	Two literature reviews, The Question Appraisal System (Willis, 2005) and cognitive interviewing	Three expert panels: 1. Four nurses working at university or county hospitals, 2. Expert panel consisting of five experts in pedagogy (PhD from area of patient education), 3. Ten nurses (3 primary care, 3 municipal or community care, 4 medical or surgical wards) Korean version: Expert panel of six content experts (2 professors of nursing, 4 haemodialysis nurses with more than 20 years of clinical experience)	+	Tested on 701 nurses working in primary, municipal and hospital care. Tested on 3 haemodialysis nurses.
Attitudes on barriers and facilitators to patient education (Iran)	Literature review	Expert panel of eight (nurse instructors)	+	Reliability tested by 10 nurses and 10 nursing students.
Knowledge, attitude, and practice of Health-Care Workers regarding patient education (Iran)	?	Expert panel	?	-
PECS-RN (Taiwan)	Literature review	Expert panel of five (2 education experts in university, 3 healthcare professionals at clinics)	+[a]	Item analysis with 50 nurses working in a medical centre.
HECS (Taiwan)	Literature review	Expert panel of five (2 professors of nursing education, 1 nursing administrator, 2 certified diabetes educators)	+	Item analysis with 292 senior nursing students and 165 clinical nurses.
QDTS (Indonesia) For Nurses For Patients	Literature review + Concept of Discharge education by Weiss and Piacentine (2006)	Expert panel of three (2 experts from surgical care and adult health nursing, 1 nurse instructor with expertise in adult surgical nursing care)	+	Consistency tested by 20 surgical nurses and patients in a public hospital.
Patient education performance (Republic of Korea)	Literature review	Expert panel of six (4 nurses working in haemodialysis, 2 university nursing professors)	+	-
I-CEpSE (Spain)	Literature review	Construct validation by panel of 5 experts (health education and educational sciences). Expert panel of six (1 psychologist and 5 nurses)	+	Piloted on purposive sample of 65 hospital-based nurses.

Abbreviations: ?, unclear if done; -, not done in the studies; CVI, Content Validity Index.

[a]CVI was done in both original and translated version.

TABLE 3 Competence attributes in the instruments.

Instrument	Attributes							
	Knowledge	Skills	Values	Belief	Judgement	Attitude	Ability	Performance
EPNURSE		X						X
ESPS								X
Quality of patient education	X	X				X		X
NPEQ/NPEQ-K	X	X		X		X		X
Attitudes on barriers and facilitators to patient education						X		X
Knowledge, attitude, and practice of Healthcare Workers regarding patient education	X					X		X
PECS-RN					X	X	X	X
HECS	X	X				X		X
QDTS								X
Patient education performance	X							X
I-CEpSE	X	X	X			X	X	

Nurhayati, Praneed, et al., 2019) as COSMIN standards recommend at least seven members (Mokkink et al., 2018). In addition, some of the panels did not include any representation from the target population (e.g. Hwang et al., 2018), or the representation of the target population could not be clearly discerned (Johansson et al., 2002; Lin & Wang, 2017). However, most of the instruments were pretested among the target population. Thus, the MQ of the *content validity* was at least *adequate* in all included studies except Garshasbi et al. (2016). Its methodological content validity was deemed low as there was no description of how the instrument's theoretical background was constructed or of the content validation process. Three studies reached the highest COSMIN rating (Bergh et al., 2012; Kääriäinen & Kyngäs, 2010; Pueyo-Garrigues et al., 2020).

3.2.2 | Internal structure

The evaluation of MQ of *structural validity* was possible with five of the instruments (PECS-RN, ESPS, NPEQ, HECS and I-CEpSE). PECS-RN was rated to have *adequate* MQ in structural validity. Rating was, however, affected by the lack of confirmatory factor analysis and a sample size that was slightly smaller than recommended, seven times the number of items and ≥100 (Lin & Wang, 2017). ESPS *structural validity* rating was *adequate* because of the small sample size (Kettunen et al., 2006).

In NPEQ, factor analysis was not originally performed (Bergh et al., 2015) but Jung and Roh (2021) performed exploratory factor analysis on the Korean version. However, lack of confirmatory factor analysis also meant that NPEQ *structural validity* was rated *adequate* by COSMIN standards even though the sample ($n = 264$) well exceeded the recommended size. Both HECS and I-CEpSE were rated to have *very good* MQ for *structural validity* as both exploratory and confirmatory factor analysis were used, and the sample sizes clearly exceeded the recommended minimum (Hwang et al., 2018; Pueyo-Garrigues et al., 2020).

MQ of the *internal consistency* was possible to assess in 16 out of the 19 studies as Cronbach's α was not calculated in the original NPEQ studies (Bergh et al., 2012, 2014, 2015). However, Jung and Roh (2020, 2021) did report a Cronbach's α for NPEQ, which was 0.93 in the 2020 study and 0.91 in the 2021 study, and thus rated *very good*.

In four studies, the MQ of *internal consistency* was assessed to be *inadequate* due to lack of reporting α values of all the subscales as recommended by Mokkink et al. (2018). The studies were Nurhayati, Praneed, et al. (2019); Nurhayati, Songwathana, et al (2019) as only one Cronbach's α was reported for the two separate subscales, Garshasbi et al. (2016) as only the knowledge subscale was reported separately, and Charalambous et al., (2018) as only one α was reported for the six subscales of EPNURSE content (Mokkink et al., 2018). The MQ of *internal consistency* was rated to be *very good* in all the other studies as the Cronbach's α was counted separately for all the unidimensional scales and/or subscales and methodology was sufficiently described (Mokkink et al., 2018).

3.2.3 | Remaining measurement properties

COSMIN standards on reliability and measurement error could be assessed in three of the 19 studies.

In reliability testing, the instruments PECS-RN (Lin & Wang, 2017), HECS (Hwang et al., 2018) and I-CEpSE (Pueyo-Garrigues et al., 2020) used the test–retest method. In all studies, the size of the test–retest sample was good ($n = 71$, $n = 37$, $n = 66$ respectively) and represented the target population well. The interval between the tests was also in the recommended timeline of 10 to 14 days in all three studies (Streiner & Kottner, 2014). However, in all three the similarities of the setting and data collection method had to be assumed as these were not clearly described.

In addition, COSMIN standards require an intraclass correlation coefficient or weighted Kappa to be analysed (Mokkink et al., 2018).

TABLE 4 MQ and IQ of the instruments.

Measurement study (year)	CTT or IRT	Content validity		Structural validity		Internal consistency		Reliability		Measurement error	
		MQ	QR	MQ	QR	MQ, α	QR	MQ	QR	MQ	QR
Empowering Patient Education from the point of view of Nurses (EPNURSE)											
Johansson et al. (2002)	CTT	Adequate	+	0		Very Good	? (0.49–0.89)	0		0	
Eloranta et al. (2016)	CTT	0		0		Very Good	? (0.51–0.90)	0		0	
Charalambous et al. (2018) – *Only content subscales*	CTT	Adequate	+	0		Inadequate[a]	+ (0.95)	0		0	
Klemetti et al. (2018) – *Content not included*		0		0		Very Good	+ (0.84–0.89)	0		0	
Copanitsanou et al. (2019)	CTT	0		0		Inadequate[a]	+ (0.88)	0		0	
Empowering Speech Practices Scale (ESPS)											
Kettunen et al. (2006)	CTT	Adequate	+	Adequate	+	Very Good	? (0.52–0.88)	0		0	
Quality of patient education											
Kääriäinen and Kyngäs (2010)	CTT + IRT	Very Good	+	Adequate	+	Very Good	? (0.63–0.92)	0		0	
Nurse Patient-Education Questionnaire (NPEQ)											
Bergh et al. (2012) Bergh et al. (2014) Bergh et al. (2015)	CTT	Very Good	+	0		0		0		0	
Nurse Patient-Education Questionnaire in Korean (NPEQ-K)											
Jung and Roh (2020)	CTT	0		Adequate	?	Very Good	+ (0.93)	0		0	
Jung and Roh (2021)	CTT	0		Adequate	+	Very Good	+ (0.91)				
Attitudes on barriers and facilitators to patient education											
Ghorbani et al. (2014)	CTT	Adequate	?	0		Adequate	+ (0.90)	0		0	
Knowledge, attitude, and practice of Health-Care Workers regarding patient education											
Garshasbi et al. 2016	CTT	Doubtful	?	0		Inadequate[a]	? (0.62–0.71)	0		0	
Patient Education Competence scale for Registered Nurses (PECS-RN)											
Lin and Wang (2017)	IRT	Adequate	?	Adequate	?	Very Good	+ (0.96–0.98)	Doubtful	?	Adequate	?
Health Education Competency Scale (HECS)											
Hwang et al. (2018)	CTT	Adequate	+	Very Good	+	Very Good	+ (0.88–0.95)	Doubtful	?	Adequate	?
Quality of Discharge Teaching Scale (QDTS)											
Nurhayati, Praneed, et al. (2019) Nurhayati, Songwathana, et al. (2019)	CTT	Adequate +		0		Inadequate[a]	+ (0.95)	0		0	
Patient education performance											
Jung and Roh (2020)	CTT	Adequate	+	0		Very Good	+ (0.96)	0		0	
Nurse Health Education Competence Instrument (I-CEpSE)											
Pueyo-Garrigues et al. (2020)	CTT	Very Good	+	Very Good	+	Very Good	+ (0.70–0.95)	Very Good	+	Adequate	+

Abbreviations: CTT, classical test theory; IRT, Item response theory; MQ, methodological quality rated as Very good, Adequate, Doubtful, or Inadequate; QR, quality of the results rated as Sufficient (+), Intermediate (?), Insufficient (–); 0, not assessed in the study.

[a]Cronbach α not calculated separately for each subscale.

TABLE 5 Synthesis of evidence.

Measurement	Content validity	Structural validity	Internal consistency	Reliability	Measurement error
EPNURSE	High	-	High	-	-
ESPS	High	High	Moderate	-	-
Quality of patient education	High	High	Moderate	-	-
NPEQ	High	Moderate	High	-	-
Attitudes on barriers and facilitators to patient education	High	-	High	-	-
Knowledge, attitude, and practice of Health-Care Workers regarding patient education	Low	-	Moderate	-	-
PECS-RN	High	Moderate	High	Low	Moderate
HECS	High	High	High	Low	Moderate
Patient education performance	High	-	High	-	-

With PECS-RN, only interclass correlation (Pearson's test) was calculated during the development.

Additionally, no evidence was provided of the occurrence of possible systematic change. For these reasons, the PECS-RN MQ on *reliability* reached a COSMIN rating of *doubtful*. Also, in the HECS study, Pearson's test was used, and the test–retest settings or possible systematic changes were not described (Hwang et al., 2018). Thus, it was given an equal rating with PECS-RN. I-CEpSE was given the highest rating in MQ of reliability as it filled all the COSMIN criteria (Pueyo-Garrigues et al., 2020). MQ of measurement error was assessed to be *adequate* in all three studies as the only shortcoming was an unclear description of possible differences between the test and retest settings. (Hwang et al., 2018; Lin & Wang, 2017; Pueyo-Garrigues et al., 2020.)

It was not possible to assess the MQ of cross-cultural validity or criterion validity by the COSMIN standards in any of the studies. In addition, the COSMIN standards of hypotheses testing, and responsiveness were not assessed in this review.

3.3 | Quality of the instrument

The quality of each property of the instrument was rated to be either *sufficient* (+), *indeterminate* (?) or *insufficient* (–) using the updated rating by Prinsen et al. (2018). The QI was assessed by the standards of content validity, structural validity, internal consistency, reliability, and measurement error.

The QI in *content validity* was assessed to be *sufficient* in all instruments, excluding Garshasbi et al. (2016). It gained the rating of indeterminate due to the lack of description. The QI in *structural validity* was assessed *indeterminate* in PECS-RN as not all necessary information for assessment was reported. With EPNURSE the QI in *internal consistency* was rated as *indeterminate* for the first two studies (Eloranta et al., 2016; Johansson et al., 2002) as in both, at least one of the subscales had a Cronbach α value under 0.70. The subscales in question (*functional* and *social* in 2001 and *functional* in 2010) were further developed between and after the studies. Thus, the α values were all above 0.70 in later studies (Charalambous et al., 2018; Copanitsanou et al., 2019; Klemetti et al., 2018;), reaching the rating of *sufficient*. In HECS (Hwang et al., 2018), NPEQ (Jung & Roh, 2020, 2021), PECS-RN (Lin & Wang, 2017) and I-CEpSE (Pueyo-Garrigues et al., 2020) the QI in *internal consistency* was rated *sufficient*.

The QI in *reliability* was rated *indeterminate* in both PECS-RN (Lin & Wang, 2017) and HECS (Hwang et al., 2018).

The QI in *measurement error* was also assessed to be *indeterminate* in both instruments as the minimal important change was not calculated. (Hwang et al., 2018; Lin & Wang, 2017)

3.4 | Quality of evidence

When summarized, the evidence on the instruments was mostly from moderate to high quality (Table 5). However, assessing the quality of evidence was challenging due to the limited number of studies per instrument. For example, there was a second study using I-CEpSE that was published in 2022 but it referred to the previous 2019 study and did not include any further tests for instrument validation and thus could not be included in the review (Pueyo-Garrigues et al., 2022).

4 | DISCUSSION

This systematic review had three aims. First, we identified validated self-reported instruments for measuring nurses' competence or attribute(s) of competence in empowering patient education. After that, the development and content of instruments were described, and then the instruments were critically appraised and summarized.

4.1 | Development and content of the instruments

Development of instrument is an integral part of the assessment of content validity (Prinsen et al., 2018; Terwee et al., 2018). Overall, the development process was described clearly, and pre-testing was reported. However, the pre-testing was very varied from four individuals (Kettunen et al., 2006) to pilot with 701 nurses (Bergh et al., 2012, 2014). Additionally, some of the expert panels did not

meet the COSMIN standards. Although COSMIN requires expert panels to have seven or more members, we consider it a priority to examine the composition of the panels instead of sheer numbers. Paying more attention to the composition could further strengthen the instrument development process. It would be particularly important to include a wider representation of the target population.

Theoretical background was based on the literature review in most of the instruments. Patient empowerment was referenced as an aim of education in some form in all included studies. However, as a theoretical framework, empowerment was only used and defined clearly in EPNURSE (Johansson et al., 2002) and ESPS (Kettunen et al., 2006). The variability of concept interpretation was also evident when compared with the empowerment approaches between EPNURSE, ESPS and HECS. HECS presented empowerment as a process of professionals giving empowerment to the patients with the aim of increasing motivation to make changes (Hwang & Kuo, 2018; Hwang et al., 2018). Instead, both EPNURSE and ESPS approached empowerment as patients' inner process supported by professionals with the aim of patients gaining ability to manage their condition and where patients were not required to change in any certain way (Johansson et al., 2002; Kettunen et al., 2006), which is closer to the empowerment framework guiding this study. Using the concept without a clear empowerment framework may lead to practices that are ultimately not truly supportive of patient empowerment (Halvorsen et al., 2020) and carry a risk of further obscuring the concept.

These results correspond to the findings in the patient empowerment review by Agner and Braun (2018) and support the call for clearer definitions of empowerment in studies and base of instrument development (Pekonen et al., 2020). Thus, we argue that support for empowerment should be more emphasized and specifically measured in patient education competence with a clear definition of the concept.

In relation to the concept of competence, the heterogeneity in content was an expected result as an informed decision was made to use a wide selection of competence attributes to reach all the relevant instruments for this study. The decision was based on this study's aim, which was not to define competence as a singular concept with specific attributes but instead, to find and assess all existing instruments developed to measure nurses' competence in empowering patient education based on different views of competence. Performance was the most measured attribute while attributes of belief, ability and values were each identified from one instrument. This scattered nature of competence attributes in the instruments is related to the complexity of the concept of competence (Watson et al., 2002; Yanhua & Watson, 2011). The results further support the need for continued efforts to clarify competence as a concept to better define and measure it.

4.2 | Methodological quality and quality of instruments

Overall, the methodological quality of the studies was at least adequate. Lack of evidence on both the instruments and their measurement properties was a challenge for the assessment. In line with previous reviews on measurement instruments (e.g., Pekonen et al., 2020), the measurement properties were only partially described in most of the studies. This lack of evidence also affected the depth of the instrument quality assessment as only certain areas of the quality could be considered.

The most assessed measurement property was internal consistency, calculated by Cronbach α. The Cronbach α score was either sufficient or intermediate in all studies that used it. It is known that alpha is affected by the length of the scale and instruments with more than 15 items may receive high values (>0.90) while still relating to different underlying constructs. Thus, additional tests should be used to supplement Cronbach α. (Streiner & Kottner, 2014.) In this review, only three studies (Kääriäinen & Kyngäs, 2010; Hwang et al., 2018; Lin & Wang, 2017) out of 19 were identified to have used additional tests (e.g. item analysis, Kääriäinen & Kyngäs, 2010) to assess internal consistency. However, this recommendation is not included in the COSMIN standards.

According to COSMIN standards, cross-cultural validation is always recommended if samples are from different countries, but also if the sample consists of different groups, e.g., registered nurses and nursing students (Mokkink et al., 2018; Terwee et al., 2018). Some of the studies described differences in results obtained with the instrument (e.g., Hwang et al., 2018) or sensitivity of the instrument in different groups (e.g. Pueyo-Garrigues et al., 2020). However, none of the studies presented information on possible differences in relevant characteristics between these groups. Thus, the findings in this review are consistent with the study of Flinkman et al. (2017) which noted that studies with different culture groups should provide more detailed information on cross-cultural validation.

Criterion validity, i.e., comparing the instrument to golden standard (Mokkink et al., 2018), could not be assessed in relation to any of the instruments due to the lack of an instrument considered golden standard in this field (Hwang et al., 2018). PECS-RN (Lin & Wang, 2017) was assessed in relation to another instrument, Clinical Teaching Competence Inventory (CTCI). However, because CTCI was not an instrument used to measure patient education competence, by the COSMIN standards it was evaluated as inappropriate for assessing the criterion validity of the instrument in question (Mokkink et al., 2018).

Reviewers acknowledge that no individual study, or even a series of studies, can fully confirm the reliability or validity of an instrument (Streiner & Kottner, 2014). In addition, there is no consensus on which psychometric properties should be used and assessed in instrument development, and depending on the used criteria, not all of them are considered equally important (Terwee et al., 2007). More rigorous testing is needed to gain more knowledge on quality of both existing and new instruments. In addition, more attention should be given on the reporting of instrument development and validation process to confirm the opportunity for later assessment of methodological and instrument quality.

In this review, we focus our suggestion on a clearer acknowledgement of patient empowerment as an aim for patient education and the comprehensive measurement of varied competence attributes. Of the instruments in this review, EPNURSE and ESPS were

most comprehensively built on the theory of empowerment with a clearly described empowerment framework while the Spanish I-CEpSE had the highest evaluation in both methodological and instrument quality when compared with the COSMIN criteria. However, in this review HECS was assessed to be the most suitable instrument of the current instruments available for measuring competence in empowering patient education. The instrument was clearly targeted at measuring multiple competence attributes in patient education, included pedagogical aspects, and had empowerment support as one of its three subscales. It was also one of the three instruments assessed with both exploratory and confirmatory factor analyses, which strengthens its validity.

4.3 | Limitations

The limitations in this review were the (a) complexity of concepts as discussed previously, (b) inclusion and exclusion criteria, (c) chosen quality criteria and (d) scarcity of evidence as discussed previously. In addition, the review was not preregistered, and protocol was not published.

Inclusion criteria selection had challenges that were related to the complexity of concepts. Using patient empowerment as an inclusion criterion instead of as a search term and pre-testing of the search strategy was done to respond to the challenges related to the concepts of empowerment as well as competence. Using the year 2000 as the starting point for the literature search was also confirmed in pre-tests as no suitable studies were found before that point in time. In addition, we tried to further minimize limitations with additional database searches by using the instruments found in the chosen studies and by a manual search of references, leading to one additional EPNURSE study (Eloranta et al., 2016). However, a possibility remains that some research was missed despite our efforts.

We acknowledge that many different quality criteria exist for assessing the quality of studies and instruments. We chose COSMIN for this review as it is a validated and widely used tool which is systemically updated (Mokkink et al., 2018; Prinsen et al., 2018; Terwee et al., 2018) and has been used to assess instruments developed to evaluate the competence of nursing professionals (e.g Al Jabri et al., 2021). However, as only one of the instruments (Pueyo-Garrigues et al., 2020) was developed and reported following the COSMIN criteria, the MQ scores for many of the instruments were affected by the lack of required information (Terwee et al., 2012).

4.4 | Implications for practice

In clinical practice, the results of this review can be used in developing patient education to be more empowering. To enable development, it is important to identify and select accurate instruments of nurses' competence in empowering patient education. In nursing administration, the results can be used for developing the quality of patient education by identifying areas in need of development and to improve quality systematically as well as for identifying a need for nurses' continuing education and educational resource allocations. Furthermore, it could be useful to analyse, how empowering patient education is implemented in the curricula of nursing education.

5 | CONCLUSION

Attention toward competence in patient education has increased, but it is still rarely measured as its own core competence of nursing professionals, and evidence on the psychometric properties of existing instruments is scarce and scattered. In addition, empowerment as part of the theoretical basis of both patient education and educational competence of nurses remains unclear. The psychometric properties of the existing instruments assessing nurses' competence in empowering patient education need to be further tested and future instrument development should be built on more rigorous testing and reporting.

AUTHOR CONTRIBUTIONS

Study design: Silja-Elisa Eskolin and Heli Virtanen. Data collection: Silja-Elisa Eskolin and Heli Virtanen. Data analysis: Silja-Elisa Eskolin and Heli Virtanen. Manuscript writing: Silja-Elisa Eskolin, Saija Inkeroinen, Helena Leino-Kilpi, and Heli Virtanen.

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CONFLICT OF INTEREST STATEMENT

None to declare.

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The data used in this review is not publicly available.

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