

This is an electronic reprint of the original article.
This reprint *may differ* from the original in pagination and typographic detail.

Author(s): Immonen, Kati; Tuomikoski, Anna-Maria; Kääriäinen, Maria; Oikarinen, Anne; Holopainen, Arja; Kuivila, Heli; Männistö, Merja; Mikkonen, Kristina; Mattila, Outi; Vesterinen, Soili; Pääatalo, Kati; Koivunen, Kirsi; Ylimäki, Saija; Mikkonen, Kristina

Title: Evidence-based healthcare competence of social and healthcare educators : A systematic review of mixed methods

Year: 2022

Version: Publisher's version

Licence: CC BY 4.0

Please cite the original version:

Immonen, K., Tuomikoski, A.-M., Kääriäinen, M., Oikarinen, A., Holopainen, A., Kuivila, H., Männistö, M., Mikkonen, K., Mattila, O., Vesterinen, S., Pääatalo, K., Koivunen, K., Ylimäki, S. & Mikkonen, K. (2022). Evidence-based healthcare competence of social and healthcare educators : A systematic review of mixed methods. *Nurse Education Today*, 108.

<https://doi.org/10.1016/j.nedt.2021.105190>



Review



Evidence-based healthcare competence of social and healthcare educators: A systematic review of mixed methods

Kati Immonen^{a,*}, Anna-Maria Tuomikoski^{b,c}, Maria Kääriäinen^{c,d,e}, Anne Oikarinen^f, Arja Holopainen^g, Heli Kuivila^a, Merja Männistö^b, Kristina Mikkonen^a, Outi Mattila^h, Soili Vesterinen^h, Kati Päätaalo^b, Kirsi Koivunen^b, Saija Ylimäki^{c,i}, Kristina Mikkonen^c

^a Research Unit of Nursing Science and Health Management, University of Oulu, Finland

^b Oulu University of Applied Sciences The Finnish Centre for Evidence-Based Health Care: a JBI Centre of Excellence, Helsinki, Finland

^c Research Unit of Nursing Science and Health Management, University of Oulu, Oulu, Finland

^d Medical Research Center Oulu, Oulu University Hospital and University of Oulu, Oulu, Finland

^e The Finnish Centre for Evidence-Based Health Care: A JBI Centre of Excellence, United States of America

^f Research Unit of Nursing Science and Health Management, Faculty of Medicine/University of Oulu, Finland

^g Nursing Research Foundation, The Finnish Centre for Evidence-Based Health Care: a JBI Centre of Excellence, WHO Collaborating Centre for Nursing, Helsinki, Finland

^h Lapland University of Applied Sciences, Finland

ⁱ Oulaskangas hospital, Ostrobothnia Hospital District, Finland

ARTICLE INFO

Keywords:

Health educators
Professional practice
Evidence-based
Education
Social care
Healthcare
Evidence
Competence
Higher education
Mixed-methods
Systematic review

ABSTRACT

Background: Social and healthcare operating environments are constantly evolving, so educators have major responsibility for ensuring that Evidence-Based Healthcare is included in the education of future healthcare professionals and applied in their practice. A holistic understanding and implementation of evidence-based healthcare competence is critical to the delivery of appropriate, relevant, and effective healthcare.

Aim: To identify and describe social and healthcare educators' EBHC competence according to the five main components of the JBI model and associated factors to it.

Methods: A mixed-methods systematic review was conducted, with inclusion and exclusion criteria identified according to PICO and PEO inclusion criteria for qualitative and quantitative studies, respectively. Five databases—the CINAHL (EBSCO), PubMed, Scopus, Medica and ProQuest databases—were searched in June 2020. In total, 12 original studies (qualitative and quantitative) were included for quality appraisal, data extraction and narrative synthesis.

Results: Key competence areas addressed in the selected studies were integrated into the four components of the JBI model of EBHC (evidence generation, synthesis, transfer, and implementation, and focus on its ultimate goal: global health). In the majority of chosen studies, it was found that educators had a positive attitude towards EBHC and wanted to stay up-to-date in the areas of global health and collaboration. Educators demonstrated their abilities to locate, appraise, and interpret the best current relevant evidence. They knew how to integrate EBHC into their teaching and had strong communication skills in evidence transfer. Their EBHC competence was strongest in the educational context and educators could transfer evidence when teaching but were not able to translate it into how to implement EBHC in clinical care. In addition to higher academic education and work experience, organizational support and continuous education reportedly play essential roles in development of educators' EBHC competence.

Conclusion: Measures are needed to maintain and improve social and health educators' EBHC competence and develop robust methods to reliably assess it.

* Corresponding author.

E-mail addresses: kati.immonen@student.oulu.fi (K. Immonen), annukka.tuomikoski@oamk.fi (A.-M. Tuomikoski), maria.kaarainen@oulu.fi (M. Kääriäinen), anne.oikarinen@oulu.fi (A. Oikarinen), arja.holopainen@hotus.fi (A. Holopainen), heli.kuivila@oulu.fi (H. Kuivila), merja.mannisto@oamk.fi (M. Männistö), kristina.mikkonen@oulu.fi (K. Mikkonen), outi.mattila@lapinamk.fi (O. Mattila), soili.vesterinen@lapinamk.fi (S. Vesterinen), kati.paatalo@oamk.fi (K. Päätaalo), kirsi.koivunen@oamk.fi (K. Koivunen), saija.ylimaki@student.oulu.fi (S. Ylimäki), kristina.mikkonen@oulu.fi (K. Mikkonen).

<https://doi.org/10.1016/j.nedt.2021.105190>

Received 15 June 2021; Received in revised form 13 October 2021; Accepted 25 October 2021

Available online 30 October 2021

0260-6917/© 2021 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

As social and healthcare practices and services are changing as a result of political, social and economic factors so there are constant needs to foster corresponding educational competencies and ensure that future educators develop and apply them (Kuivila et al., 2020, Mikkonen et al., 2019a). Social and healthcare educators are expected to have a wide range of competencies that also requires the diverse development of Evidence-Based Healthcare (EBHC) expertise (McAllistair and Flynn, 2016; Mikkonen et al., 2018). Educators have major responsibility for the quality of health education and the competence of future healthcare professionals to use EBHC in their daily work environments (Aglén, 2016). Educators must use up-to-date evidence when educating students, working with colleagues, and developing new educational approaches with a special focus to ensure that graduates have competence to benefit healthcare systems and global health. EBHC provides a framework for guiding clinical decision-making, including clinical expertise and scientific evidence from well-designed studies (Melnyk et al., 2014).

The Joanna Briggs Institute (JBI) regards EBHC as a cyclical process, in which evidence is first generated through research, expertise and discourse (Jordan et al., 2019). The generated evidence is synthesized in guidelines, summaries, and systematic reviews, then transferred through education, systems integration, and active dissemination. Following implementation of the evidence (through context analysis, facilitation of change, and evaluation of process and outcomes) the state of global health is assessed (including the sustainable impact of previous EBHC cycles, engagement and further knowledge requirements).

The EBHC concept is often used interchangeably in the literature with evidence-based practice (EBP), which refers to rooting activities in evidence, i.e., using the best available evidence for health promotion, rehabilitation, and patient care. Evidence-based decision-making in these activities takes into account available evidence, patients' or their relatives' preferences, possibilities in the care environment, and the nurses' experience and professionalism (Jordan et al., 2019). Consequently, evidence is collected, and results are evaluated, synthesized, and transferred to service delivery environments and healthcare professionals, who apply it and assess its impact on healthcare systems, health outcomes, and professional practice (Pearson et al., 2005; Jordan et al., 2019).

However, the EBHC concept encompasses a broader perspective of evidence development, use and implementation, and hence is consistently used here. Educational activities can affect EBHC competence (including knowledge, skills, attitudes and practice), and ultimately the quality of healthcare and health outcomes. The JBI Model of Evidence Based Healthcare was first published in 2005 (Pearson et al., 2005) and updated in 2019 (Jordan et al., 2019) and its purpose was to situate healthcare evidence, its role and use within primary care and clinical practice settings globally. The various components of the model, including evidence generation, evidence synthesis, evidence transfer, and evidence implementation, describe how it can be actioned pragmatically.

Healthcare professionals and educators need competence in all stages of the JBI's EBHC model. Social and health educators usually require a university degree and/or doctorate, as well as at least two years' experience of working in the healthcare field (Salminen et al., 2021). Educators usually work in higher education institutions, where students are educated as healthcare professionals at various degree levels, with many educators also playing important roles in clinical work as students' supervisors (Lahtinen et al., 2014, University of Applied Science Act 1129/2014, Paul, 2015, National League for Nursing, 2019). The minimum qualifications for social and healthcare educators are based on the competences they require to adopt new approaches in the design, implementation, and evaluation of educational programs (WHO, 2016; From, 2017; Mikkonen et al., 2018). Educators' competence has been defined as multidimensional, including both 'micro-level'

competences (in social and healthcare science and professions, pedagogy, ethics, culture, interaction, collaboration & networking, administration & welfare) and 'macro-level' competences in EBHC, sustainable innovation, and continuing competence development. EBHC has also been recognized as an essential competence that must be integrated into not only teaching of students, but also daily decision-making, research project work and leadership (Mikkonen et al., 2019a).

Social and healthcare educators have a crucial role in identifying information needs that require evidence. For example, educators guide students through practice training in different healthcare organizations. Because educators in academic and clinical settings are required to use and apply EBHC competencies and integrate them into their daily practice, utilizing EBHC in their teaching and guiding students through each stage of the model (Halvari et al., 2021). Most studies have explored competence in the clinical setting, but less is known about the current global state of EBHC practices, and competences of social and healthcare educators. Structured evidence and shared international understandings of their EBHC competence is required, and relevant research fills the gap of knowledge.

2. Methods

2.1. Aim of the study

The aim of this systematic review was to identify and describe social and healthcare educators EBHC competence according to the five main components of the JBI model and associated factors to it.

1. What are the social and healthcare educators EBHC competences according to the JBI EBHC model in higher education or vocational institutions?
2. What are the associations between social and healthcare educators EBHC competences and socio-demographic and background factors?

2.2. Study design

Relevant original studies were systematically reviewed to synthesize evidence related to the study's aim. The JBI Manual for Evidence Synthesis (2020) was used to guide the search for evidence pertinent to the research questions and synthesize findings of relevant studies (Aromataris and Munn, 2020). The review was conducted in accordance with JBI methodology for systematic reviews of mixed methods (Lizarondo et al., 2019), and the protocol has been registered in the PROSPERO National Institute for Health Research database (authors-blinded).

2.3. Search strategy and inclusion criteria

Studies were screened using pre-defined PICO (participants, phenomena of interest and context) inclusion and exclusion criteria for qualitative studies and PEO (Population/Problem/Patient, Exposure, Outcome) criteria for quantitative studies (Moola et al., 2020 + other ref. for PEO criteria, if necessary). Defined participants were *social and healthcare educators* (including educators' healthcare professional background of dental hygienists, dental technicians, medical technologists, midwives, naprapaths, occupational therapists, opticians, osteopaths, paramedics, physical therapists, podiatrists, prosthetists, public health nurses, radiographers, rehabilitation counselors, registered nurses, nurses, and social service workers). Qualitative and descriptive quantitative studies were included if phenomena of interest included experiences, perceptions and views of educator' EBHC (including evidence-based practice, informed-based practice, evidence-based nursing, evidence-based healthcare, evidence implementation, evidence generation, evidence synthesis, and evidence transfer), and educators' *competence* (including competence, skills, attitude, knowledge, know-how, values and beliefs). Represented contexts were *university, university of applied science, higher education, vocational school, and occupational*

school. Analytical quantitative studies were selected based on PEO criteria including participants (as previously mentioned), exposure of interest in terms of socio-demographic/background factors associated with EBHC competences, and outcome focused on evidence-based healthcare competences (as already mentioned).

The study types selected for the review were peer-reviewed, original, qualitative, non-experimental studies (such as descriptive and analytical cross-sectional and longitudinal studies, causal comparative and correlational studies), and mixed-methods studies if evidence regarding either qualitative or quantitative components of EBHC were extracted. No time limit was set on searches, and studies published in English or Finnish were included. No grey literature was included. A library specialist was used to test and verify mesh terms and text keywords (see Supplementary File 1).

Five electronic databases—the CINAHL (EBSCO), PubMed, Scopus, Medica and ProQuest databases—were searched for relevant literature in June 2020, applying PRISMA methodology. Overall, 368 studies with apparently relevant titles were identified (200, 72, 43, 9, and 44, respectively, in the listed databases), of which 80 duplicates were removed. Four researchers (authors-blinded) screened the articles separately then discussed and eventually reached consensus on sets of titles, abstracts, and full texts that warranted further inspection. This process left a set of 39 studies, 12 of which were found to fully meet the

inclusion criteria for this systematic review (three mixed methods, five quantitative, and four qualitative studies). The complete search strategy is presented in Fig. 1.

2.4. Critical appraisal

The methodological quality of the 12 included studies was evaluated according to JBI guidelines (Aromataris and Munn, 2020). The JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies (Moola et al., 2020) was used to appraise the studies involving non-experimental, quantitative methods (n = 6), the JBI Critical Appraisal Checklist for Qualitative Research for the studies based on qualitative methodology (n = 5) (Lockwood et al., 2015), and both checklists for the one remaining, mixed methods study (n = 1). The checklists for qualitative research and non-experimental quantitative studies included 10 and eight assessment criteria, respectively (Supplementary File 2).

The quality assessment was conducted separately by two researchers, then the results were compared, and consensus was reached. Evaluation scores ranged between 40 and 90% for the qualitative studies: 40, 50, 70 and 80% for studies by Upton et al. (2015), Lehane et al. (2018), (Welch et al., 2014) and Felicilda-Reynaldo and Utley (2015), respectively, and 90% for two studies (Mthiyane and Habedi, 2018, Mikkonen et al., 2019b). The evaluation scores for non-experimental, quantitative

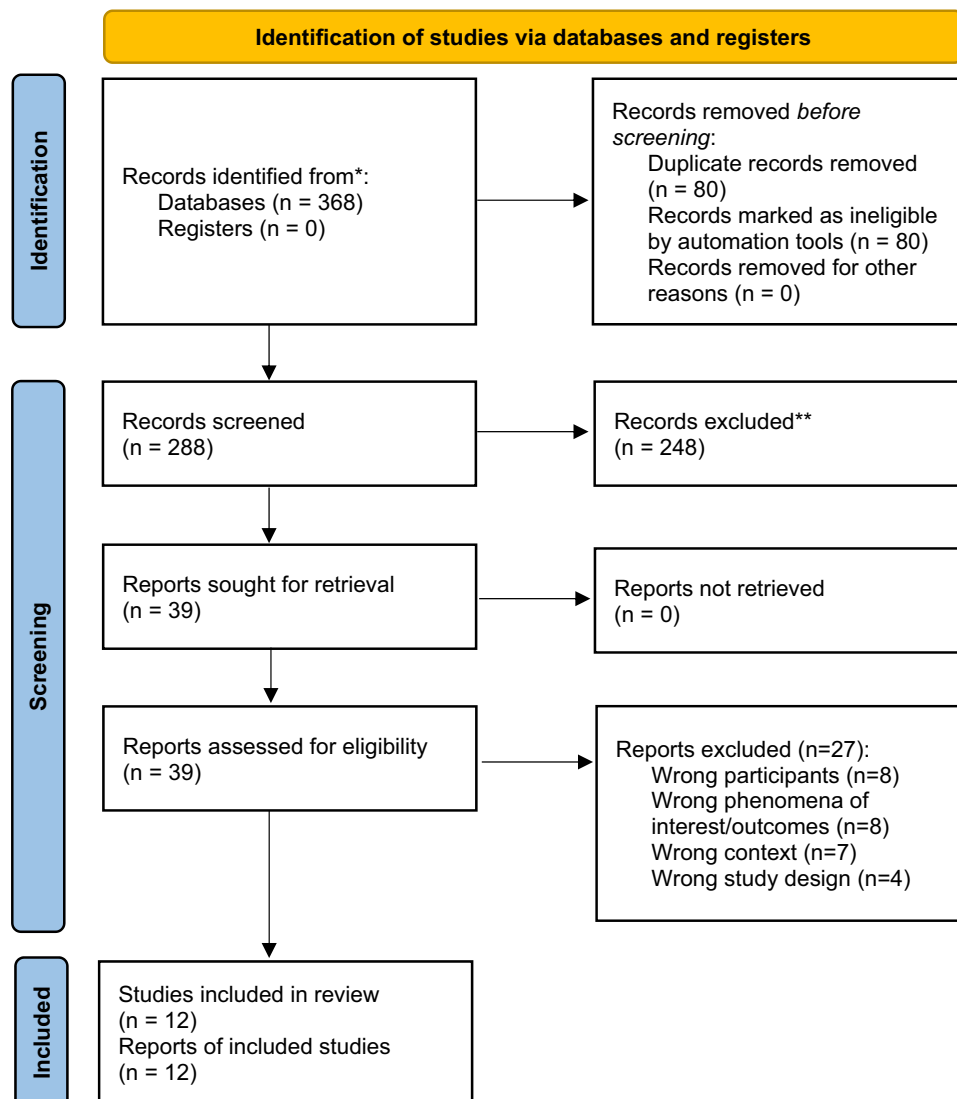


Fig. 1. PRISMA Flow 2020 diagram. Article selection and screening process.

studies ranged between 25% and 100%: 25% for one by [Patterson and Klein \(2012\)](#), 40% for studies by [Welch et al. \(2011\)](#) and [Stanley et al. \(2015\)](#), 75% for one by [Upton et al. \(2015\)](#), 90% for two by [Scholten-Peeters et al. \(2011\)](#) and [Youssef et al. \(2018\)](#), and 100% for one by [Koivula et al. \(2011\)](#) (Supplementary File 2).

2.5. Data extraction and synthesis

Data (author, year, country of origin, study purpose, participants, data collection, analytical methodology and findings) were extracted from studies included in the review by one independent reviewer (authors-blinded) and checked by another (authors-blinded), then discrepancies (if any) were discussed together and resolved. The main findings and quality assessment results are presented in [Table 1](#).

The qualitative studies were analyzed by deductive content analysis, by coding the reported results, hierarchically categorizing them according to the research questions posed in this study and classifying the categories according to the five main components of the JBI EBHC model: global health, evidence generation, evidence synthesis, evidence transfer and evidence implementation ([Jordan et al., 2019](#), [Mikkonen and Kääriäinen, 2020](#)). The coding was initially done, line-by-line, by one of the researchers (authors-blinded), then confirmed by another researcher (authors-blinded). The most relevant findings were synthesized according to the key EBHC competence areas of social and healthcare educators.

3. Results

3.1. Study characteristics

The included studies were conducted in the USA ($n = 5$), Finland ($n = 2$), Egypt ($n = 1$), Ireland ($n = 1$), The Netherlands ($n = 1$), South Africa ($n = 1$), and the UK ($n = 1$). There were 1577 participants in total, and numbers in specific studies varied between five and 375.

Educators' competence in the five components of the JBI's EBHC model were measured with the following instruments: the Nursing Teachers Research Utilization Scale (NTRUS, 1–5 Likert scale) ([Koivula et al., 2011](#)), questionnaire items measuring EBP competence (0–100% scale) ([Patterson and Klein, 2012](#)), the Epidemiologic Research questionnaire (DOERAK, 1–7 Likert scale) ([Scholten-Peeters et al., 2011](#)), the Knowledge, Attitudes, Access, Confidence Evaluation assessment instrument (KACE, 1–5 Likert scale) ([Stanley et al., 2015](#)), Evidence-Based Practice Questionnaire (EBPQ, 1–7 Likert scale) ([Upton et al., 2015](#); [Youssef et al., 2018](#)), and EBP knowledge measurement items of the Berlin Questionnaire and Fresno Test of Evidence-Based Medicine (0–100% scale, Likert scale 1–4) ([Welch et al., 2011](#)) and Developing Evidence-Based Practice Questionnaire (DEBPQ, 1–5 Likert scale) ([Youssef et al., 2018](#)).

3.2. Evidence-based healthcare competence of social- and health-care educators

Findings regarding social and healthcare educators EBHC competence extracted from the systematic review were compared, integrated, and discussed in terms of the five components of the JBI Model of Evidence-Based Healthcare (JBI 2019), as summarized in [Table 2](#) and in [Fig. 2](#) and described below.

3.2.1. Global health and EBHC demands

The studies found in the systematic review detected clear links between EBHC and educators' values and attitudes, confirming the importance of educator engagement in EBHC. However, their values and attitudes were most often considered in the context of evidence-based practice (EBP) rather than all phases of the JBI's model. A positive attitude towards EBP was found, but it does not guarantee a high level of associated knowledge and skills, as deficiencies in perceived levels of

educators EBP, knowledge and skills were also detected ([Felicilda-Reynaldo and Utley, 2015](#); [Upton et al., 2015](#); [Mthiyane and Habedi, 2018](#)). A positive association between attitude towards research and research activities, particularly production of scientific publications, has also been found and discussed ([Koivula et al., 2011](#)). However, none of the studies directly discussed the competence educators require to promote global health and their role in it when educating future healthcare professionals.

3.2.2. Evidence generation

Knowledge of research, related skills, and the utilization of research in teaching are important areas of educator competence that enable the active generation of information and a broad approach to knowledge acquisition. One of the most important competence elements identified is the ability to find the best research for use and to improve the strengthening of research data ([Koivula et al., 2011](#); [Scholten-Peeters et al., 2011](#); [Welch et al., 2011](#); [Patterson and Klein, 2012](#); [Welch et al., 2014](#); [Stanley et al., 2015](#); [Upton et al., 2015](#)). A need for educators to become more involved in research, especially in clinical settings, to improve their research skills (which could help efforts to understand and use evidence more in daily work practices) was detected ([Upton et al., 2015](#)). Participating educators also reported that they wanted to be up-to-date, keeping their knowledge current, based on researched international studies, and grounded in expert knowledge ([Mthiyane and Habedi, 2018](#)). They used research data in many ways to reform teaching practices ([Koivula et al., 2011](#); [Patterson and Klein, 2012](#); [Mthiyane and Habedi, 2018](#)) and felt that more involvement in research could reinforce the importance of evidence-based teaching in educators' competence ([Upton et al., 2015](#)).

Overall, their ability to explain the research process and steps involved was reflected in their evidence generation area of competence ([Scholten-Peeters et al., 2011](#); [Stanley et al., 2015](#)). Several authors found that educators had competence in various EBHC-related practical skills, such as analyzing research findings, definition of concepts and identification of PICo components ([Scholten-Peeters et al., 2011](#); [Stanley et al., 2015](#); [Youssef et al., 2018](#)). However, [Patterson and Klein \(2012\)](#) reported that although educators they surveyed had good research skills, they had weakness in diverse use of current educational literature.

3.2.3. Evidence synthesis

In several studies, authors found that educators' ability to find the best possible evidence for use was a significant skill associated with evidence synthesis ([Stanley et al., 2015](#); [Upton et al., 2015](#); [Mikkonen et al., 2019](#)), and that ability to use systematic reviews, databases and national guidelines supports their evidence-based teaching ([Scholten-Peeters et al., 2011](#); [Patterson and Klein, 2012](#)). Educators surveyed by [Youssef et al. \(2018\)](#) reportedly knew how to find relevant evidence, integrate it with expertise, and share identified information with colleagues, while participants in many studies demonstrated competence in appraising, evaluating and interpreting research, applying evidence in nursing care and finding evidence through nursing research ([Patterson and Klein, 2012](#); [Felicilda-Reynaldo and Utley, 2015](#); [Stanley et al., 2015](#); [Upton et al., 2015](#); [Youssef et al., 2018](#); [Mikkonen et al., 2019](#)). Significantly only small groups of educators participating in two studies admitted that they did not use any researched knowledge to support their teaching ([Koivula et al., 2011](#); [Patterson and Klein, 2012](#)).

3.2.4. Evidence transfer

The visibility of evidence-based practice in education is essential for learners to understand the importance of evidence and develop ability to apply it in clinical decision-making and other aspects of professional practice ([Felicilda-Reynaldo and Utley, 2015](#); [Lehane et al., 2018](#)). [Scholten-Peeters et al. \(2011\)](#) and [Lehane et al. \(2018\)](#) found that educators showed good competence in using research in collaboration with work-related practices. [Lehane et al. \(2018\)](#) also found that integration and transfer of evidence into educator teaching practices can be

Table 1
Data extraction table for qualitative studies.

Qualitative studies					
Authors, year and country	Purpose	Participants	Methodology, data collection and data analysis	Main findings	Quality Assessment
Lehane E., Leahy-Warren P., O'Riordan C., Savage E., Drennan J., O' Tuathaigh C., O'Connor M., Corrigan M., Burke F., Hayes M., Lynch H., Salm L., Heffernan E., O'Keeffe E., Blake C., Horgan F., Hegarty J. 2018, Ireland.	To find key perspectives from international EBP education experts on the provision of EBP education for healthcare professionals.	Experts from the UK, Canada, New Zealand and Australia (n = 5). Four of the five interviewees were medical professionals.	Qualitative study design. A six-step process was applied. Qualitative content analyses were used.	Need of EBP principles to be integrated throughout all elements of healthcare professions curricula. Grounding of teaching strategy and associated methods from a clinically relevant perspective with student exposure to EBP. EBP role models were emphasized as being integral to the application of EBP in clinical decision-making and facilitating the contextualization of EBP within different settings. The provision of training for educators to aid the further development of skills and use of resources necessary for effective EBP teaching was recommended. The lack of academic and clinical staff knowledgeable in teaching EBP was a barrier to effective and efficient student learning. Supporting staff to have confidence and competence in teaching EBP and providing opportunities for learning throughout education programs are necessary to facilitate change in this area.	JB Qualitative 5/10
Mikkonen K., Koskinen M., Koskinen C., Koivula M., Koskimäki M., Lähteenmäki M-L., Mäki-Hakola H., Wallin O., Sjögren T., Salminen L., Sormunen M., Saaranen T., Kuivila H-M., Kääriäinen M. 2019, Finland.	To find out what are social and healthcare educators' perceptions of their competence in education.	Social and healthcare educators (n = 48).	Qualitative study design. Interviews with open questions with semi-structured format. Inductive content analysis.	Subject competence was recognized to be at the multi-professional knowledge level, requiring integration of evidence-based knowledge and deep competence in one's area of expertise. Educators recognized the necessity for deep competence in integration of theory in professional practice. Key elements mentioned included abilities to retrieve, evaluate, integrate and create evidence-based knowledge, which were regarded as important for preparing future professionals to foster evidence-based practice in social and healthcare professional sectors. Educators also know importance of research and connecting theory and practice and using EBP in their daily work.	JBO Qualitative (9/10)
Mthiyane G. & Hadebi D. 2018, South Africa.	To find out the experiences of nurse educators in implementing EBP in teaching and learning, and to describe the importance and benefits of EBP in teaching and learning in the nursing profession.	Nurse educators (n = 12)	Qualitative study (CQR). Individual telephone interviews. Comprehensive process analysis.	Nurse educators are experiencing challenges with the implementation of EBP in teaching and learning (time constraints, lack of and poor access to relevant resources, the use of traditional teaching approaches, nurse educators' lack of or poor knowledge and skills, and the quality of nursing students). The main barrier to EBP is lack of value for EBP. Integration of EBP in teaching and learning as the best way to follow.	JB Qualitative (9/10)
Welch C., Hankemeier D., Wyant A., Hays D., Pitney W., Van Lunen B. 2014, USA.	To explore beneficial strategies and techniques which could promote successful implementation of EBP within education and clinical practice. Focus was on educators and	Athletic trainers (n = 24).	Qualitative study (CQR). Individual telephone interviews. Comprehensive process analysis.	Study discussed the need for more resources. Suggestions ranged from general EBP resources such as books to specific resources such as project examples. Trainers expressed the desire for more	JB Qualitative (7/10)

(continued on next page)

Table 1 (continued)

Qualitative studies					
Authors, year and country	Purpose	Participants	Methodology, data collection and data analysis	Main findings	Quality Assessment
	clinicians' perceptions of useful strategies to integrate and use EBP.			processed information about research literature and expressed an interest in workshops focusing on 1 or 2 specific concepts within EBP. Trainers expressed the need for peer discussion and mentorship regarding EBP implementation. Participants discussed the value of being able to talk about the various concepts involved in EBP with both peers and experts. Participants described the importance of repetition and constantly exposing trainers to the concepts involved in EBP. Participants indicated that ATs have a professional responsibility to learn and implement EBP within education and clinical practice.	

strengthened by using research in collaboration with work-related practices and use of patient examples and clinical scenarios is one of the most effective instructional practices.

In numerous studies it was found that educators with long work experience apply evidence-based teaching and research developments in their pedagogical activities more strongly than less experienced educators (Koivula et al., 2011; Welch et al., 2011; Patterson and Klein, 2012; Felicilda-Reynaldo and Utley, 2015; Stanley et al., 2015; Youssef et al., 2018). Optimal evidence-based education was recommended in several studies to facilitate change (Patterson and Klein, 2012; Upton et al., 2015; Lehane et al., 2018; Youssef et al., 2018). In addition, seeing positive impacts of personal teaching actions and positive feedback from colleagues reportedly provides important confirmation of educators' personal evidence-based decision-making and teaching practices (Patterson and Klein, 2012, Upton et al., 2015, Welch et al., 2014). Accordingly, communication skills emerged as one of the most important areas of social and healthcare educators' competence (Upton et al., 2015; Lehane et al., 2018; Mthiyane and Habedi, 2018). In particular, peer support, including sharing experiences, leverage of feedback, and the ability to discuss evidence-based teaching competence, reinforces implementation of EBP and educators decision-making ability (Welch et al., 2014; Lehane et al., 2018; Mthiyane and Habedi, 2018).

3.2.5. Evidence Implementation

Educators participating in many of the studies recognized the importance of implementing EBP in all aspects of their practice (Welch et al., 2014; Stanley et al., 2015; Upton et al., 2015; Lehane et al., 2018; Youssef et al., 2018; Mikkonen et al., 2019b). Thus, the ability to evaluate, create and integrate EBP into healthcare and education was widely recognized as an important competence area for contributing to and improving the quality of nursing education (Koivula et al., 2011, Welch et al., 2011, Stanley et al., 2015, Lehane et al., 2018, Youssef et al., 2018, Mikkonen et al., 2019a, 2019b). However, the rapidly changing nature of healthcare affects the success of evidence implementation (Felicilda-Reynaldo and Utley, 2015), and demands ability to implement new knowledge quickly, which educators find difficult according to Upton et al. (2015) and Lehane et al. (2018). Upton et al. (2015) also found that some participating educators felt that organizational culture influenced coworkers' attitudes and perceived changing old teaching practices as challenging. Educators felt they needed support for continuous change in order to implement evidence and change teaching practices (Scholten-Peeters et al., 2011, Patterson and Klein, 2012, Welch et al., 2011,

Felicilda-Reynaldo and Utley, 2015, Lehane et al., 2018, Mthiyane and Habedi, 2018, Youssef et al., 2018).

3.3. Background factors associated with educators' evidence-based healthcare competence and use of evidence in teaching

Background factors of educators EBHC competence were divided into factors related to competence and factors related to use of evidence in teaching.

3.3.1. Factors affecting educators EBHC

Experiences of educators EBHC are affected by the resources available and various other organizational factors (Mthiyane and Habedi, 2018), which should be considered when attempting to establish an organizational culture based on EBHC. However, in several studies it was found that there is no common, specific strategy for implementing evidence-based healthcare into national curricula (Welch et al., 2014; Upton et al., 2015; Lehane et al., 2018). This is unfortunate, as precise definition and standardization of the whole evidence-based concept facilitates its implementation, leaving educators more time to focus on their own research skills and use of relevant evidence (Welch et al., 2014; Upton et al., 2015; Mthiyane and Habedi, 2018). A lack of cohesion has also been found between clinical and academic settings, and that identifying ways to enhance communication and contact time between these settings may be helpful in multiple ways (Upton et al., 2015).

Educators have emphasized that they need continuous professional development to be competent educators, and willingness to develop because development does not occur automatically as it is a growth process that requires constant work (Mikkonen et al., 2019b). Effective education is required to improve evidence-based teaching quality, so formal training should extend to clinical and academic educators (Lehane et al., 2018). For example, some educators have expressed the value of mentoring by experts with the ability to provide in-depth knowledge and skills for individuals seeking assistance (Welch et al., 2014). Keeping up with new knowledge in education and professional subjects or areas has high proven importance, so it would be useful to increase mentoring and exploit the potential to enhance EBP offered by conferences and various internet platforms (Welch et al., 2014; Upton et al., 2015; Lehane et al., 2018).

Table 2

Data extraction table for quantitative studies.

Quantitative studies					
Koivula M., Tarkka M-T., Simonen, M., Katajisto J., Salminen L. 2011, Finland.	The aim of this study was to describe how nursing teachers utilize research on nursing education and its connections to teachers' background, further education and research activity variables. Study is a part of national study project evaluating the competences of nursing teachers.	Nursing teachers (n = 339)	A descriptive, cross-sectional survey. The measurement tool was the Nursing Teachers Research Utilization Scale (NTRUS). Descriptive statistical analysis. Response rate 46%.	Educators who participated in this study expressed awareness of the importance of research and using evidence-based knowledge in their daily work practices. Nursing teachers' research utilization was moderately good in general, but differed by academic degree, official title, research and development activities and publication activities. There was strong connection between nursing teachers' research utilization and their research and development activities and publication activities. 40% of teachers undertake no research activities and that these teachers provide significantly less nursing science-based teaching.	JBIMASTARI (8/8)
Scholten-Peeters G., Beekman-Evers M., van Boxel A., van Hemert S., Paulis W., van der Wouden J. & Verhagen A. 2011. Netherlands.	To explore attitudes, knowledge and behavior aspects towards EBP.	Physical therapist students (n = 49), practicing physical therapist (n = 81), physical therapy teachers (n = 9) and physical therapy supervisors (n = 26).	A cross-sectional survey. Moderate DOERAK questionnaire. Data were analyzed with SPSS, descriptive statistics were used. Response rate 20%.	Teachers scored moderately positive attitude in favor in participating in research. They are used more often systematic reviews, PubMed and national guidelines as a source. Teachers rated their EBP knowledge good (77,8%). Only teachers felt able to explain terms odds ratio and systematic reviews to each other's. In all groups, participants answered that scientific evidence most often influenced their clinical decision making and patient values less often.	JBIMASTARI (7/8)
Stanley J., Hanson C., Van Ness C. & Holt L. 2015, USA.	To assess dental hygiene educators EBP knowledge, attitude, access and confidence.	Dental hygiene educators (n = 124)	A cross-sectional survey. Data were collected utilizing the KACE assessment instrument. Exploratory analysis with descriptive statistics used as analysis.	Participants reported a positive attitude towards EBP and reported a variety of sources for accessing evidence. The majority of participants reported they were moderately confident in their critical appraisal skills of EBP. Also, positive attitude to EBP and to access EB literature. The majority of respondents understand the components of a PICO question, have knowledge of the various levels of evidence and are able to analyze the results of a research study. The positive relationship between degree level obtained and EBP knowledge shown in this study supports the role education has in the attainment of EB knowledge.	JBIMASTARI (6/8)
Welch C, Van Lunen BL, Walker SE, Manspeaker SA, Hankemeier DA, Brown SD, Laursen RM & Onate JA. 2011, USA	To assess athletic training educators' current knowledge, comfort and perceived importance of evidence- based concepts.	Athletic training educators (N = 141).	Cross-sectional survey design. Adopted item's on EBP knowledge measurement of the Berlin Questionnaire and the Fresno Test of Evidence-Based Medicine. Statistical analysis. Response rate 28.3%.	Athletic training educators are uncomfortable with evidence-based concepts, yet believe it is important for curricular implementation. Terminally degree educators felt more comfortable with EB concepts than individuals without terminal degree. Educators who conducted more than five hours of research per week achieved higher composite knowledge, comfort and importance scores than educators who did not. Athletic training educators' knowledge of EBP concepts vary	JBIMASTARI (3/8)

(continued on next page)

Table 2 (continued)

Quantitative studies					
Youssef N., Alshraifeen A., Alnuaimi K. & Upton P. 2018, Egypt.	Identify the attitudes, perceived knowledge and skills, and implementation of EBP as perceived by nurse educators (in Egyptian and Jordanian universities) and to assess factors preventing them from adopting it in nursing program.	Academic faculty members (total N = 124) Clinical instructors (42), Assistant lecturer (27), Lecturer (24), Assistant professor (20), Professor (5), Other (6).	A cross-sectional design conducted including two questionnaires (EBPQ and DEBPQ) and demographic data sheet. Data analyzed using SPSS and descriptive and inferential statistics used. Response rate 34,55%	from basic understanding to more advanced comprehension. Athletic training educators current EBP knowledge scores are falling behind other health care professionals. The vast majority of respondents strongly agreed that it is important for faculty members to use EBP in nursing education and that EBP contributes to advancing science and improving the quality of nursing education. Nursing educators had moderate attitudes and perceived knowledge and skills of EBP. The study also found differences among nurse educators based on their academic qualifications. Doctoral degree holders had higher perceived knowledge/skills of EBP than Master's or Bachelor's degree holders. Barriers of EBP: Lack of time and how to find research of organizational reports. Most of the nurse educators in this study received little support from their colleagues and managers in changing teaching practice.	JBIMASTARI (7/8)
Mixed method studies Felicia-Reynaldo R H. & Utkley R. 2015, USA.	Focus is on the importance of evidence-based practice as described in the teaching philosophy statements of academic nurse educators (ANEs).	Academic nurse educators (n = 375) from 33 states.	A mixed-method design using an online survey. Statistical analysis while narrative data was coded and analyzed to identify themes.	Three themes emerged: keeping up-to-date, setting up student success with EBP, and EBP as a teaching approach. Key elements mentioned included abilities to retrieve, evaluate, integrate and create evidence-based knowledge, which were regarded as important for preparing future professionals to foster evidence-based practice in social and healthcare professional sectors. Educators expressed awareness of the importance of research and using evidence-based knowledge in their daily work practices. They also emphasized the importance of connecting theory and practice.	JBIMASTARI (8/10)
Patterson B. & Klein J. 2012, USA.	To find out what types of evidence do nurse educators use as a basis of their evidence practice, what are the factors that influence the incorporation of evidence in the nurse educators teaching practice and what is the process that nurse educators use to change their teaching practice.	Nurse educators (n = 295).	Descriptive study design was designed to answer 3 specific research questions. Questionnaire. Statistical analyses were conducted using SPSS. Response rate 15%.	Types of evidence which educators based their teaching: research was selected as the most frequent source of evidence for their teaching practice. Educators felt that they are well prepared to use evidence in their teaching practice. Facilitator to EBPT was personal beliefs. Time and heavy teaching load were the barrier. 94% used EBP in teaching with multiple sources.	JBIMASTARI (2/8)
Upton P., Scurlock-Evans L., Williamson K., Rouse J. & Upton D. 2015, United Kingdom.	To explore differences/similarities in the EBP profiles of US and UK clinical and academic faculty; the barriers teaching EBP, the impact of postgraduate education on EBP profile and experiences implementing and teaching EBP to be.	Academic faculty (staff working in the academic context) and clinical faculty (staff working in the clinical context) (N = 81).	A cross-sectional online survey design. Data collection with Evidence-Based Practice Questionnaire (EBPQ). Qualitative and quantitative analysis. Response rate 27.0%.	Nurse educators held positive attitude towards EBP. Valuing EBP and recognizing its importance to healthcare were crucial to its teaching. Some participants felt that aspects of organizational culture inhibited the use and teaching of EBP. Some participants felt that there was a lack of cohesion between	JBIMASTARI (6/8) & JBIMASTARI Qualitative (4/10)

(continued on next page)

Table 2 (continued)

Quantitative studies
<p>academic and clinical teaching context, which made the teaching of EBP difficult. As access to research is a key issue for EBP and that's why the lack of time and resources for accessing evidence may impact on knowledge currency and skills maintenance. Academic faculty reported greater knowledge/ skills than clinical staff. Academic staff may have better opportunities to access EBP resources, training or support.</p>

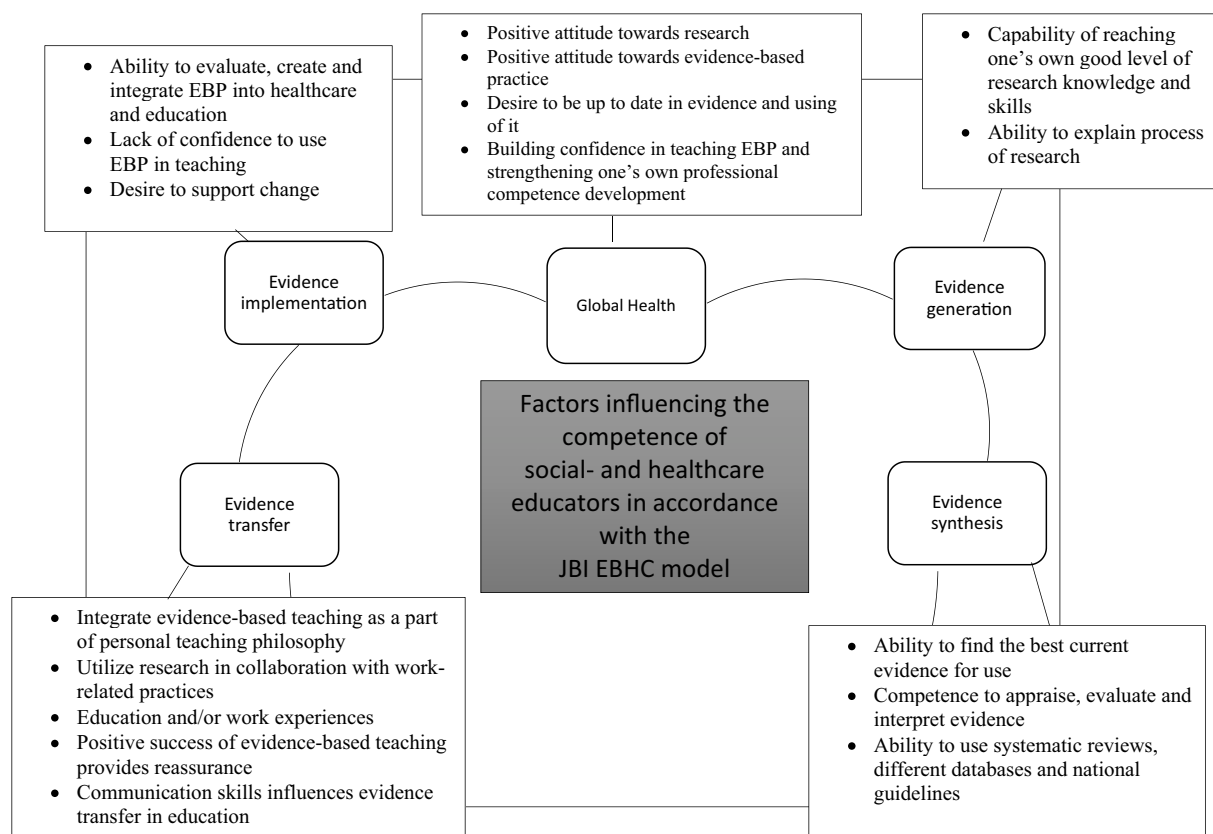


Fig. 2. Results according JBI EBHC themes.

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

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

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 2021;372:n71. doi: <https://doi.org/10.1136/bmj.n71>

For more information, visit: <http://www.prisma-statement.org/>

3.3.2. Factors affecting educators' evidence-based teaching competence

The implementation of evidence as part of educators' competence and its integration into all aspects of their personal teaching philosophy is clearly important (Welch et al., 2014; Upton et al., 2015; Felicilda-Reynaldo and Utley, 2015; Mthiyane and Habedi, 2018; Mikkonen et al., 2019b). It is essential for educators to show self-direction and a desire to develop and strengthen their personal competence areas (Mikkonen et al., 2019b), while also accepting the responsibility for strengthening their own development (Welch et al., 2014; Lehane et al., 2018).

Several studies found associations between evidence-based knowledge and both educators official title and academic qualifications

(Koivula et al., 2011; Welch et al., 2011; Youssef et al., 2018). For example, Youssef et al. (2018) found that doctorate degree holders were more likely to practice evidence-based teaching, and had higher perceived knowledge associated with EBHC, than those holding bachelors or masters' degrees. Similarly, Koivula et al. (2011) found that educators with doctoral degrees in nursing based their teaching more on evidence than those with masters' degrees and other education. Educators working as leaders and members of research teams had a more evidence-based approach to teaching than those who did not engage in research activities (Koivula et al., 2011).

High quality resources, like textbooks, help educators to understand

the elements of evidence-based teaching (Welch et al., 2014), but they have demonstrated continuing requirements for access to high quality and processed resources (Welch et al., 2014; Upton et al., 2015; Mthiyane and Habedi, 2018). The importance of this is highlighted by educators expressing perceptions that it is much simpler to use old teaching methods, as time constraints and heavy workloads prevent the constant updating required to adopt new methods (Welch et al., 2014; Mthiyane and Habedi, 2018). These constraints also hinder evidence-based competence development, by severely restricting the time available to search for relevant evidence (Patterson and Klein, 2012).

4. Discussion

The aim of this systematic review was to identify and describe social and healthcare educators' EBHC competence according to the five main components of the JBI model and associated factors to it. The JBI framework (JBI 2019) covers healthcare evidence in its broadest sense, and both its use and role in healthcare settings. Educators have an essential role in ensuring that future social and healthcare professionals have high EBHC competence, know-how to work in accordance with sustainable development in different operating environments, and ability to provide high-quality, people-oriented services (Jylhä et al., 2017). However, EBHC is a relatively new and broad approach. The model and its implications for the study of educators' competences have received little research attention, although various components of the model have been addressed. The narrower EBP concept has generally been more intensively researched, illuminated, and shown to be an important element of educators' evidence-based teaching (Kuivila et al., 2020; Mikkonen et al., 2018). Therefore, it is difficult to identify whether some studies are discussing evidence or research knowledge, as much of the evidence considered consists of information recently acquired through research. None of the reviewed studies directly discussed competence educators require to promote global health, but according to Jordan et al. (2019) they need better understanding and evaluation of global healthcare to clearly identify research gaps and collaboratively develop healthcare systems through their educational role in preparing future social and healthcare professionals.

However, educators clearly value evidence and its use in teaching (Koivula et al., 2011; Patterson and Klein, 2012; Felicilda-Reynaldo and Utey, 2015; Upton et al., 2015; Lehane et al., 2018), which reinforces the need to integrate aspects of the EBHC model into teachers' competences. Participants in some studies identified their own areas of expertise and needs for their development (Felicilda-Reynaldo and Utey, 2015; Upton et al., 2015; Mthiyane and Habedi, 2018), but the studies did not necessarily use appropriate terms or fully consider key aspects and components of EBHC. For example, the difference between evidence and research was not always clearly distinguished.

The studies revealed that part of evidence-based health care competence was measured using a variety of instruments. The main focus in previous studies was on measuring educators' attitudes, their general knowledge about EBP (Youssef et al., 2018; Scholten-Peters et al., 2011), and the use of research data in teaching (Koivula et al., 2011). Although different instruments were able to measure specific competence areas, some aspects of the EBHC JBI model were not measured in any of the included studies. It would therefore be useful to develop assessment methods to support the EBHC model, as it clearly demonstrates a model of an evidence-based healthcare process of achieving an evidence-based approach to clinical decision-making.

In the systematic review we noted that there was little research on evidence generation according to the EBHC model. Thus, in the future more knowledge should be obtained about educators' competence in this respect, for example how they utilize systematic reviews and care recommendations in teaching. Educators clearly know how to base their teaching on evidence in daily practice but use it less in clinical settings (Koivula et al., 2011; Patterson and Klein, 2012; Upton et al., 2015; Mthiyane and Habedi, 2018), and this should be strengthened in the

future. Accordingly, educators typically see acquisition of research knowledge and teaching skills as a way to improve knowledge of EBHC (Keib et al., 2017) and recognize the importance of research and use of EBHC in educators daily work and responsibilities (Moynihan et al., 2015).

Generally, most previous studies on EBHC curricular elements in nursing education have focused on academic activities rather than clinical education and practice (Malik et al., 2016). There is a corresponding lack of common, specific, national strategies for implementing evidence-based teaching into curricula (Upton et al., 2015; Welch et al., 2014; Lehane et al., 2018), so curricular integration of all EBHC components would be valuable for the development of educators' competence and future healthcare professionals. The EBHC concept should be precisely defined and standardized in educators education to facilitate its implementation, allowing them to focus on developing their own research skills and using relevant evidence (Upton et al., 2015; Welch et al., 2014; Mthiyane and Habedi, 2018).

This study shows that broader EBHC education is required for educators, particularly regarding use of EBHC in professional contexts, which would support clinical decision-making and facilitate implementation of evidence in specific settings (Koivula et al., 2011; Patterson and Klein, 2012; Upton et al., 2015; Lehane et al., 2018; Mthiyane and Habedi, 2018). Recognition of the importance of research data and evidence in each component of the EBHC model should be strengthened so that educators can distinguish them, and act accordingly in their work. If educators lack clear understanding of what EBHC is and how its phases should be implemented in different contexts, confusion about associated concepts and their places in practical work is likely to arise. The evidence-based competence of educators could be developed using indicators for assessing and enhancing specific competences. For example, Leung et al. (2016) have presented an EBP competency assessment tool that specifically targets the mental and physical skills required to complete each stage of EBP and can be applied in clinical practice.

The exploration of factors associated with educators EBHC competence showed that higher education and work experiences have strong influences. Higher academic education is recommended as it can enhance educators development of competence in research and deeper understanding of EBHC. Educators' communication skills should also be enhanced so that knowledge of the different stages of the EBHC model is more thoroughly implemented in clinical settings. This could ensure good care for people in need of EBHC and appropriate allocation of social and health resources.

4.1. Limitations

This systematic review has several limitations. First, it did not include grey literature, so some important studies on educators EBHC competence may have been missed. Second, some of the studies included in the final synthesis had low quality according to the critical appraisal, but this can be regarded as both a strength and weakness. Low quality studies may present biased results and have poor generalisability but may still provide information that warrants inclusion in narrative synthesis and may assist attempts to answer research questions. We also strove to minimize limitations and maximize the quality and transparency of the reporting of the review, by using the PRISMA Statement for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Page et al., 2021).

5. Conclusions

Social and healthcare educators play important roles in the implementation and development of EBHC. Although perceptions of evidence-based activities and related competency requirements are constantly changing, educators should be able to identify current research data and base their teaching on evidence. However, this study showed that social and healthcare educators EBHC competence has received little research

attention. Educators require guidance to help them master all aspects of the JBI's EBHC model in diverse settings and from multiple perspectives, as EBHC is not a simple, linear process, so users should be able to establish their own best practices based on the model. Knowledge of the different stages of the model strengthens educators' evidence-based teaching and hence ability to allocate resources appropriately. The findings confirm that educators EBHC competence requires further exploration to raise knowledge and understanding of each of the models' stages, its goals, and implementation in social and healthcare education.

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.nedt.2021.105190>.

Funding statement

No funding.

Declaration of competing interest

Given their role as Editor on this journal, Professor Kristina Mikkonen had no involvement in the peer-review of this article and has no access to information regarding its peer-review. Full responsibility for the editorial process for this article was delegated to an independent Editor.

Acknowledgement

We would like to acknowledge Sees-Editing Ltd. (<http://www.seesediting.co.uk>) service for improving the language and helping us to communicate our findings to readers of the journal.

References

- Aglen, B., 2016. Pedagogical strategies to teach bachelor students evidence-based practice: a systematic review. *Nurse Educ. Today* 36, 255–263. Available from. In: Aromataris, E., Munn, Z. (Eds.), 2020. *JBI Manual for Evidence Synthesis*. <https://doi.org/10.46658/JBIMES-20-01>. <https://synthesismanual.jbi.global>.
- <collab>National League for Nursing, Certified Nurse Educator C.N.E.collab, 2019. *Candidate Handbook, Academic Nurse Educator Certification Program*.
- Felicilda-Reynaldo, R., Utley, R., 2015. Reflections of evidence-based practice in nurse educators teaching philosophy statements. *Nurs. Educ. Perspect.* 36 (2), 89–95 (<https://doi.org/10.5480/13-1176>).
- From, J., 2017. Pedagogical digital competence – between values, knowledge and skills. *Nurse Educ. Today* 7 (2), 43–50.
- Halvari, J., Mikkonen, K., Kääriäinen, M., Holopainen, A., Kuivila, H., Immonen, K., Koivula, M., Koskinen, C., Sjögren, T., Tuomikoski, A.M., 2021. Social, health and rehabilitation sector educators' competence in evidence-based practice – cross-sectional study. *Nurs. Open*. <https://doi.org/10.1002/nop2.1035>.
- Jordan, Z., Lockwood, C., Munn, Z., Aromataris, E., 2019. The updated Joanna Briggs institute model of evidence-based healthcare. *Int. J. Evid. Based Healthc.* 17 (1), 58–71.
- Jylhä, V., Oikarainen, A., Perälä, M.L., Holopainen, A., 2017. Facilitating evidence-based practice in nursing and midwifery in the WHO European Region. Available from. World Health Organization. https://www.euro.who.int/_data/assets/pdf_file/0017/348020/WH06_EBP_report_complete.pdf.
- Keib, C.N., Cailor, S.M., Kiersma, M.E., Chen, A.M., 2017. Changes in nursing students' perceptions of research and evidence-based practice after completing a research course. *Nurse Educ. Today* 54, 37–43.
- Koivula, M., Tarkka, M.-T., Simonen, M., Katajisto, J., Salminen, L., 2011. Research utilisation among nursing teachers in Finland: a national survey. *Nurse Educ. Today* 31, 24–30.
- Kuivila, H.-M., Mikkonen, K., Sjögren, T., Koivula, M., Koskimäki, M., Männistö, M., Lukkari, P., Kääriäinen, M., 2020. Health science student teachers' perceptions of teacher competence: a qualitative study. *Nurse Educ. Today* 84, 104210.
- Lahtinen, P., Leino-Kilpi, H., Salminen, H., 2014. Nursing education in the European higher education area — variations in implementation. *Nurse Educ. Today* 34 (6), 1040–1047. <https://doi.org/10.1016/j.nedt.2013.09.011>.
- Lehane, E., Leahy-Warren, P., O'Riordan, C., Savage, E., Drennan, J., O'Tuathaigh, C., O'Connor, M., Corrigan, M., Burke, F., Hayes, M., Lynch, H., Sahm, L., Heffernan, E., O'Keefe, E., Blake, C., Horgan, F., Hegarty, J., 2018. Evidence-based practice education for healthcare professions: an expert view., 24, 103–108.
- Leung, K., Trevena, L., Waters, D., 2016. Development of a competency framework for evidence-based practice in nursing. *Nurse Educ. Today* 39, 189–196.
- Lizarondo, L., Stern, C., Carrier, J., Godfrey, C., Rieger, K., Salmond, S., Apostolo, J., Kirkpatrick, P., Loveday, H., 2019. Chapter 8: mixed methods systematic reviews. Available from. In: Aromataris, E., Munn, Z. (Eds.), *JBI Reviewer's Manual*. <https://reviewersmanual.joannabriggs.org/>.
- Lockwood, C., Munn, Z., Porritt, K., 2015. Qualitative research synthesis: methodological guidance for systematic reviewers utilizing meta-aggregation. *Int. J. Evid. Based Healthc.* 13 (3), 179–187.
- Malik, G., McKenna, L., Plummer, V., 2016. Facilitators and barriers to evidence-based practice: perceptions of nurse educators, clinical coaches and nurse specialists from a descriptive study. *Contemporary Issues in Nursing Education* 52, 544–554.
- McAllistair, M., Flynn, T., 2016. The capabilities of nurse educators (CONE) questionnaire: development and evaluation. *Nurs. Educ. Today* 39, 122–127.
- Melnik, B.M., Gallagher-Ford, L., Long, L.E., Fineout-Overholt, E., 2014. The establishment of evidence-based practice competencies for practicing registered nurses and advanced practice nurses in real-world clinical settings: proficiencies to improve healthcare quality, reliability, patient outcomes, and costs. *Worldviews Evid. Based Nurs.* 11 (1), 5–15.
- Mikkonen, K., Kääriäinen, M., 2020. Content analysis in systematic reviews. In: Kyngäs, H., Mikkonen, K., Kääriäinen, M. (Eds.), *The Application of Content Analysis in Nursing Science Research*. Springer, Switzerland, pp. 105–115.
- Mikkonen, K., Ojala, T., Sjögren, T., Piirainen, A., Koskinen, C., Koskinen, M., Koivula, M., Sormunen, M., Saaranen, T., Salminen, L., Koskimäki, M., Ruotsalainen, H., Lähteenmäki, M.-L., Wallin, O., Mäki-Hakola, H., Kääriäinen, M., 2018. Competence areas of health science teachers – a systematic review of quantitative studies. *Nurse Educ. Today* 70, 77–86.
- Mikkonen, K., Koivula, M., Sjögren, T., Korpi, H., Koskinen, C., Koskinen, M., Kuivila, H., Lähteenmäki, M.L., Koskimäki, M., Mäki-Hakola, H., Wallin, O., Saaranen, T., Sormunen, M., Kokkonen, K.M., Kiikeri, J., Salminen, L., Rytä, I., Elonen, I., Kääriäinen, M., 2019a. Social-, health care, and rehabilitation educators competence and continuous development (in Finnish). In: *TerOpe-key government project. Acta Universitatis Ouluensis, University of Oulu, Finland*. <http://urn.fi/urn:isbn:9789526224794>.
- Mikkonen, K., Koskinen, M., Koskinen, C., Koivula, M., Koskimäki, M., Lähteenmäki, M.-L., Mäki-Hakola, H., Wallin, O., Sjögren, T., Salminen, L., Sormunen, M., Saaranen, T., Kuivila, H.-M., Kääriäinen, M., 2019b. Qualitative study of social- and healthcare educators perceptions of their competence in education. *Health Social Care Commun.* 27 (6), 1555–1563. <https://doi.org/10.1111/hsc.12827>.
- Moola, S., Munn, Z., Tufanaru, C., Aromataris, E., Sears, K., Sfetcu, R., Currie, M., Lisy, K., Qureshi, R., Mattis, P., Mu, P., 2020. Chapter 7: Systematic reviews of etiology and risk. Available from. In: Aromataris, E., Munn, Z. (Eds.), *Joanna Briggs Institute Reviewers Manual*. The Joanna Briggs Institute. <https://reviewersmanual.joannabriggs.org/>.
- Moynihan, S., Paakkari, L., Välimaa, R., Jourdan, D., Mannix- McNamara, P., 2015. Teacher competencies in health education: results of a Delphi study. *PLoS ONE* 10 (12), e0143703. <https://doi.org/10.1371/journal.pone.0143703>.
- Mthiyane, G., Habedi, D., 2018. The experiences of nurse educators in implementing evidence-based practice in teaching and learning. *Health SA Gesondheid* 23, a1177. <https://doi.org/10.4102/hsag.v23i0.1177>.
- Page, M.J., McKenzie, J.E., Bossuyt, P.M., Boutron, I., Hoffmann, T.C., Mulrow, C.D., et al., 2021. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ* 372, n71. <https://doi.org/10.1136/bmj.n71>.
- Patterson, B., Klein, J., 2012. Evidence for teaching: what are faculty using? *Nurs. Educ. Perspect.* 33 (4), 240–245. <https://doi.org/10.5480/1536-5026-33.4.240>.
- Paul, P.A., 2015. Transition from novice adjunct to experienced associate degree nurse educator: a comparative qualitative approach. *Teach. Learn. Nurs.* 10 (1), 3–11.
- Pearson, A., Wiechula, R., Court, A., Lockwood, C., 2005. The JBI model of evidence-based healthcare. *Int. J. Evid. Based Healthc.* 3 (8), 207–215.
- Salminen, L., Tuukkanen, M., Clever, K., Fuster, P., Kelly, M., Kiele, V., Koskinen, S., Sveinsdóttir, H., Löytyniemi, L., Leino-Kilpi, H., 2021. The competence of nurse educators and graduating nurse students. *Nurse Educ. Today* 98, 104769.
- Scholten-Peeters, G., Beekman-Evers, M., van Hemert, S., Paulis, W., van der Wouden, J., Verhagen, A., van Boxel, 2011. Attitude, knowledge and behaviour towards evidence-based medicine of physical therapists, students, teachers and supervisors in the Netherlands: a survey. *Journal of Evaluation in Clinical Practice* (19), 598–606.
- Stanley, J., Hanson, C., Van Ness, J., Holt, L., 2015. Assessing evidence-based practice knowledge, attitudes, access and confidence among dental hygiene educators. *J. Dent. Hyg.* 89 (5), 321–329.
- Upton, P., Scurlock-Evans, L., Williamson, K., Rouse, J., Upton, D., 2015. The evidence-based practice profiles of academic and clinical staff involved in pre-registration nursing students education: a cross sectional survey of US and UK staff. *Nurse Educ. Today* 35, 80–85.
- Welch, C., Van Lunen, B.L., Walker, S.E., Manspeaker, S.A., Hankemeier, D.A., Brown, S.D., Laursen, R.M., Onate, J.A., 2011. Athletic training educators knowledge, comfort, and perceived importance of evidence-based practice. *Athl. Train. Educ. J.* 6 (1), 5–14.
- Welch, C., Hankemeier, D., Wyant, A., Hays, D., Pitney, W., Van Lunen, B.L., 2014. Future directions of evidence-based practice in athletic training: perceived strategies to enhance the use of evidence-based practice. *J. Athl. Train.* 49 (2), 234–244.
- WHO, 2016. *Nurse Educator Core Competencies*. https://www.who.int/hrh/nursing_midwifery/nurse_educator050416.pdf. (Accessed 11 March 2020).
- Youssef, N., Alshraifeenb, A., Alnuaimic, K., Upton, P., 2018. Egyptian and jordanian nurse educators' perception of barriers preventing the implementation of evidence-based practice: a cross-sectional study. *Nurse Educ. Today* 64, 33–41.