World Health Organization

REGIONAL OFFICE FOR Europe

Facilitating evidence-based practice in nursing and midwifery in the WHO European Region

World Health Organization
REGIONAL OFFICE FOR Europe

Facilitating evidence-based practice in nursing and midwifery in the WHO European Region

By: Virpi Jylhä, Ashlee Oikarainen, Marja-Leena Perälä & Arja Holopainen

Facilitating evidence-based practice in nursing and midwifery in the WHO European Region is a guide for Member States, supported by the WHO Regional Office for Europe, to enable and enhance the contribution of nurses and midwives to promoting evidence-based practice and innovation in nursing and midwifery. It aims to promote a shared understanding of evidence-based practice in nursing and midwifery and strengthen its foundations in the Region to support health policy-makers, health-care professionals and others in facilitating the culture of evidence-based practice in nursing and midwifery. The guide provides examples to support nurses and midwives in applying evidence-based practice in their clinical roles.

Keywords
EUROPE
HEALTH SERVICES
MIDWIFERY
NURSING
WORLD HEALTH ORGANIZATION

Address requests about publications of the WHO Regional Office for Europe to:
Publications
WHO Regional Office for Europe
UN City, Marmorvej 51
DK-2100 Copenhagen Ø, Denmark
Alternatively, complete an online request form for documentation, health information, or for permission to quote or translate, on the Regional Office website (http://www.euro.who.int/pubrequest).

Text editing: Alex Mathieson, United Kingdom (Scotland).
Design: Damian Mullan, So it begins …, United Kingdom (Scotland).

CONTENTS

ACKNOWLEDGEMENTS

This document was commissioned by the technical Programme on Human Resources for Health, Division of Health Systems and Public Health, WHO Regional Office for Europe. It aims to support health policy-makers, managers, educators and health-service providers to develop and promote a culture of evidence-based practice in nursing and midwifery, and to accelerate progress in the implementation of European strategic directions for strengthening nursing and midwifery towards Health 2020 at national and regional levels.

The WHO Regional Office for Europe offers its thanks and appreciation to the WHO Collaborating Centre for Nursing at the Nursing Research Foundation in Finland and the authors of this publication: Virpi Jylhä, Ashlee Oikarainen, Marja-Leena Perälä and Arja Holopainen.

WHO also acknowledges and appreciates the support of the WHO collaborating centres for nursing and midwifery and the Joanna Briggs Institute's collaborating centres in the WHO European Region for providing valuable comments and case examples for the document.

Technical guidance and coordination of this project was provided by Galina Perfilieva, Programme Manager, Human Resources for Health, Division of Health Systems and Public Health, WHO Regional Office for Europe.

ACRONYMS

AME	Action Model of Expertise
EBP	evidence-based practice
EBHC	evidence-based health care
EIP	evidence-informed practice
JBI	The Joanna Briggs Institute
PACES	Practical Application of Clinical Evidence System (audit tool)

1. INTRODUCTION

Nurses and midwives play an important role in tackling the public health challenges present in health systems across the WHO European Region. These groups of health-care professionals collectively form the largest component of the health workforce *(1)*, and are key actors in delivering effective, efficient, accessible, acceptable, patient-centred, equitable and safe health-care services *(2)*. Quality health-care services require that clinical decision-making in nursing and midwifery and care coordination are based on evidence. The best available evidence should be utilized when improving aspects of quality in health care and enhancing evidence-based practice (EBP). The nursing and midwifery professions remain central to the achievement of EBP in health-care settings, particularly in standardizing and aligning health-care practices with evidence at the point of care *(3–5)*.

The purpose of this guide is to promote a shared understanding of EBP in nursing and midwifery and strengthen its foundations in the WHO European Region. The document aims to support health policy-makers, managers, health-care professionals and other relevant stakeholders in facilitating the culture of EBP in nursing and midwifery. This can in turn promote the effectiveness of health-care services, contribute to the utilization of evidence in clinical care and strengthen the nursing and midwifery knowledge base. Examples are provided throughout the text to highlight key elements of EBP as it relates to nursing and midwifery.

The guide sets out to clarify the concept of EBP, identify its benefits, describe fundamental elements of implementation and sustaining an evidence-based culture in health care, and summarize success factors for implementation in nursing and midwifery. It provides examples of how EBP can be facilitated at national, regional, organizational and work-unit levels. The sharing of knowledge on innovations, strategies or interventions related to EBP among countries can promote and strengthen EBP and innovation in nursing and midwifery across the Region. Member States should strive to enable nurses and midwives to apply EBP in their clinical roles to promote health and prevent disease while providing the best possible care to patients and populations based on their needs *(1)*.

Nurses and midwives should understand the meaning of EBP and facilitating factors for successful implementation *(6)*. They should acknowledge the rationale for implementing EBP and strive to develop the skills to engage with evidence and apply it to daily nursing and midwifery practice *(6)*. To provide evidence-based care for patients consistently, policy-makers, managers, health-care professionals, educators and researchers must identify their roles and responsibilities in the process *(1)*. Only when all accountable stakeholders assume their responsibilities can the goal of EBP as a standard of care be achieved *(1)*.

2. EVIDENCE-BASED HEALTH CARE AND PRACTICE

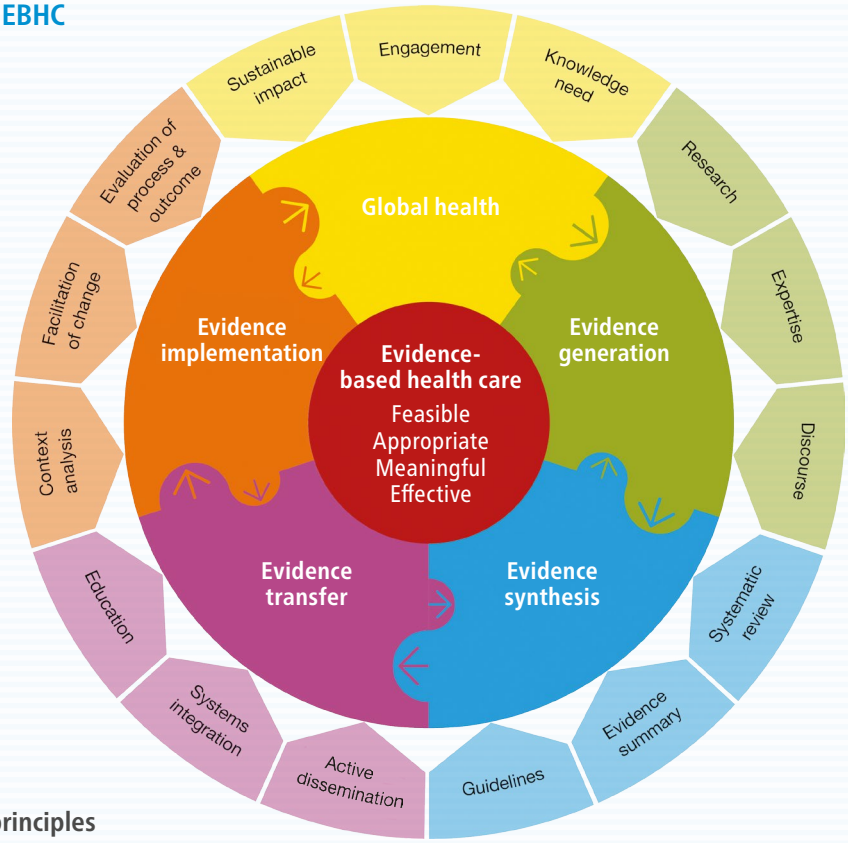
Core concepts related to EBP are often used interchangeably in health-care practice and in the literature, stimulating the need for nurses and midwives to grasp a clear understanding of the concepts and recognize how they differ *(6)*. This guide focuses on EBP, particularly on what it means to nursing and midwifery: it is nevertheless vital to promote a shared understanding of the broader concept of evidence-based health care (EBHC).

Evidence-based health care

EBHC is an umbrella concept of EBP that includes nursing, midwifery, medicine and allied health professions *(7)*. It can be conceptualized as clinical decision-making that considers the feasibility, appropriateness, meaningfulness and effectiveness of health-care practices. This may be informed by the best available evidence, the context in which care is delivered, the individual patient, and the professional judgement and expertise of the health professional *(8)*. To facilitate evidence-based decision-making, all professions in health care are to be given the opportunity to be involved in developing EBP and embedding evidence into professional practice and education *(7)*.

The Joanna Briggs Institute (JBI), an international nursing research organization, has developed the JBI model of EBHC. This conceptualizes: the steps of the process to achieve an evidence-based approach to clinical decision-making; how the component parts of the model are operationalized; and how they might be implemented in practice *(8,9)*. EBHC is not a clean, linear process; at times, the process can be bi-directional, which is represented in Fig. 1 by the smaller arrows that indicate the feedback cycle.

Fig. 1.
JBI model of EBHC



Source: Jordan et al. *(8)*. Reproduced by permission of The Joanna Briggs Institute.

The central component of the model is the so-called Pebble of Knowledge (Fig. 2), with the core phases defined as evidence generation (Fig. 3), evidence synthesis (Fig. 4), evidence transfer (Fig. 5) and evidence implementation (Fig. 6).

The feasibility, appropriateness, meaningfulness and effectiveness of various treatment options or health-care practices are to be considered in evidence-based decision-making *(8)*. Global health is the ultimate goal and endpoint of the components of the model *(8,9)*, which includes striving for a sustainable impact in changes to health-care practices, increased engagement and close multisectoral collaboration, and assessment of local communities' knowledge requirements *(8)*.

The core phases of the JBI model of EBHC are defined as evidence generation, evidence synthesis, evidence transfer and evidence utilization. Evidence generation (Fig. 3) includes discourse, professional expertise and research *(8)*. Research evidence is generated through original studies (primary research) and systematic reviews (secondary research). In this phase, systematic reviews might identify important gaps in research evidence. The gold standard of evidence is recognized by many as being the randomized controlled trial, but other types have become increasingly significant in informing nursing and midwifery practice.

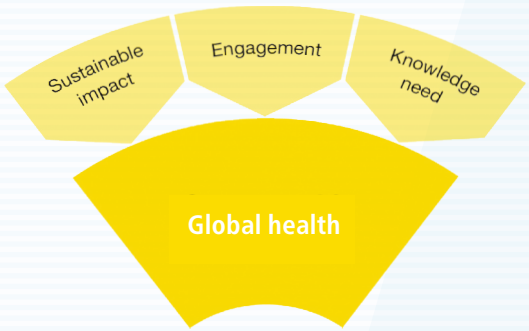
Research evidence does not always exist: nurses and midwives must make decisions in care situations based on the best evidence available at any particular time. It is therefore fundamental to recognize what specific evidence is required to answer a clinical question and identify which type of evidence is available (research, experience or discourse) during the synthesis of generated evidence *(8)*.

Current available evidence needs to be synthesized. Evidence synthesis is defined as: "the evaluation or analysis of research

Fig. 2.
The Pebble of Knowledge

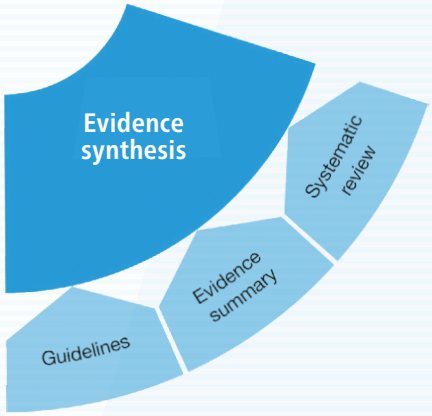
Source: Jordan et al. *(8)*. Reproduced by permission of The Joanna Briggs Institute.

Fig. 3.
Evidence generation



Source: Jordan et al. *(8)*. Reproduced by permission of The Joanna Briggs Institute.

Fig. 4.
Evidence synthesis



Source: Jordan et al. *(8)*. Reproduced by permission of The Joanna Briggs Institute.

evidence and opinion on a specific topic to aid in decision making in healthcare" *(9)*. The three main pragmatic components of evidence synthesis include systematic reviews, evidence summaries and clinical guidelines (Fig. 4 and Infobox 1).

Infobox 1. Components of evidence synthesis

A systematic review is: "… essentially an analysis of all of the available literature (i.e. evidence) and a judgement of the effectiveness or otherwise of a practice…" *(9)*.

An evidence summary is: an efficient approach to synthesize an overview of the available evidence in a timely fashion *(8,10)*.

A clinical guideline is: "statements that include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options" *(11)*.

Example 1. Cochrane Special Collection of Systematic Reviews
The special collection brings together high-quality systematic reviews on breastfeeding to support the implementation of evidence into policy and practice. The purpose of the collection is to promote effective breastfeeding for mothers and babies through the collection of the best available evidence for use by decision-makers, health professionals, advocacy groups, and women and families *(12)*.

Example 2. WHO guidelines to improve quality of antenatal care
This WHO guideline *(13)* includes comprehensive recommendations to reduce the risk of stillbirths and pregnancy complications and aims to give women a positive pregnancy experience. It includes recommendations for health-system interventions to improve the quality of antenatal care. The implementation of guideline recommendations can save lives, as antenatal care offers the potential to make a positive contribution to health promotion, screening and diagnosis, and disease prevention. The recommendations, which include evidence on harms and benefits, values, resources, equity, acceptability and feasibility, are based on different sources of evidence, such as effectiveness reviews, qualitative evidence syntheses, test-accuracy reviews and mixed-method reviews, that have been assessed and synthesized.

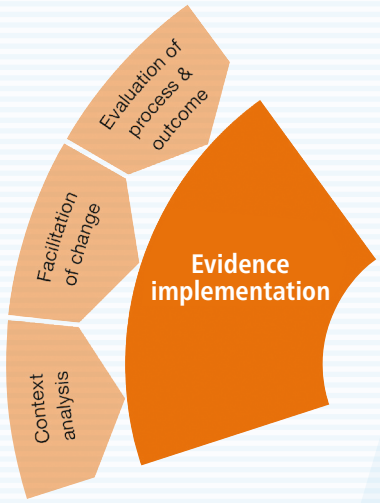
Synthesized evidence (Fig. 5) must be transferred and shared to be implemented in practice. Jordan et al. *(8)* clarify "transfer" as meaning "a coactive, participatory process to advance access to and uptake of evidence in local contexts". Transfer enables uptake of evidence and so enables, facilitates and supports evidence implementation. Essential components of evidence transfer include active dissemination, systems integration and education. The JBI model highlights the importance of dissemination of evidence using active methods and human communication to spread information in a format that encourages utilization. Education programmes, include continuing professional development or broader programmes, are recognized as an effective means of evidence transfer. Embedding evidence into the system, policies and procedures is necessary for decisions at all levels of organizations to be guided by evidence.

Evidence implementation (Fig. 6) in the context of the JBI model is defined by Jordan et al. *(8)* as: "a purposeful and enabling set of activities designed to engage key stakeholders with research evidence to inform decision-making and generate sustained improvement in the quality of healthcare delivery". The three main components of this phase are context analysis, facilitation of practice change, and evaluation of the process and outcome.

Fig. 5.
Evidence transfer

Source: Jordan et al. *(8)*. Reproduced by permission of The Joanna Briggs Institute.

Fig. 6.
Evidence implementation



Source: Jordan et al. *(8)*. Reproduced by permission of The Joanna Briggs Institute.

Prior to the adoption of an evidence-based intervention, it is necessary to design a comprehensive implementation plan *(4)* that takes into consideration the principles of organizational culture, capacity, communication and collaboration *(8)*. It is vitally important to have a plan on how to monitor and evaluate, and to sustain changes made to health-care practice *(8)*. Health-care professionals, educators, researchers, leaders and policy-makers have specific roles and responsibilities in the phases of implementing EBP *(1)*.

Example 3. Improving patient safety through evidence-based hand-hygiene practices
Good hand hygiene improves patient safety and outcomes through reducing care-associated infections. The model for hand-hygiene practice evaluation and development provides evidence-based structure and guidance for systematic and consistent monitoring of hand-hygiene practices. Combining measurement of fidelity to guidelines with compliance rates reveals inconsistencies between optimal and actual hand-hygiene behaviour. Korhonen et al. *(14)* evaluated hand-hygiene practices in a Finnish university hospital. Their observations suggested the compliance rate was as high as 78%, meaning that health professionals routinely used hand sanitizers. Fidelity measures, however, showed that hand-rubbing practices were followed according to the recommendation (which states that the overall duration of hand-rubbing should last 30 seconds or more) in only 10% of cases. It is therefore necessary to measure fidelity to guidelines to gather more specific data about the implementation of EBP *(15)*.

Evidence-based practice

EBP is a generic term that originally arose from the field of medicine. It is universally defined as: "the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient" *(16)*.

EBP is an interdisciplinary approach to decision-making in clinical practice *(17,18)* that includes the best available evidence, the care context, client values and preferences, and the professional judgement of the health professional *(9)*. It is important for nurses and midwives to recognize that a variety of external and clinical information is needed in evidence-based clinical decision-making. Further, clinical decision-making is affected by societal values and explicit and implicit values in the health system *(19)*.

The four aspects of evidence-based decision-making are shown in Infobox 2.

Infobox 2. Aspects of evidence-based decision-making

The four aspects of evidence-based decision-making are:

- integration of the best available evidence generated by quality research;
- clinical evidence and expertise;
- patient values and preferences; and
- relevant contextual knowledge, which includes available resources and acknowledges potential resource barriers and enablers within the context of care *(20–23)*.

The EBP movement began with the identification of the research-to-practice gap *(24)* and developed into a movement in which the principles of EBP have been applied to decision-making at different levels of the health system and to other fields of professional practice in health and social care, such as dentistry, nursing, midwifery, psychology, public health, radiology, social work, and policy and management *(25,26)*. Today, EBP is considered a key component of modern health care.

The aim of evidence-based approaches to clinical practice is to deliver appropriate care in an efficient manner to the patient. EBP has been described as doing the right things right and doing things efficiently to the best standard possible, while ensuring that what is done is of known effectiveness *(27)*. EBP results in quality patient outcomes when delivered in a context of caring supported by an organizational culture that supports EBP *(28)*.

Currently, the concept of evidence-informed practice (EIP) is often used interchangeably with EBP without consideration of the differences or similarities. It has been argued that the evidence-based approach is too restrictive and medicine-oriented, and that decision-making must rely on additional forms of evidence *(29,30)*. Some researchers argue that EIP provides more flexibility in the nature of the evidence used, and that EIP extends beyond the early definitions of EBP *(29)*. For this reason, international debate on the utilization of these two concepts is ongoing.

The definition of EIP contains similar components to that of EBP, such as evidence, patient preferences and actions, clinical state and circumstances, and health-care resources. These components are brought together by clinical expertise, through which decisions can be informed.

The term evidence-informed practice has been used, especially in public health and social care. It is defined as: "a complex, multi-disciplinary process that occurs within dynamic and ever-changing communities and encompasses different sectors of society" *(31)*. Lavis et al. *(32)* emphasize the use of research to inform public policy-making, where a range of evidence is needed to make decisions.

Example 4. Evidence-informed Policy Network
This is a global WHO initiative that promotes the systematic use of health-research evidence in policy-making and aims to increase Member States' capacity to develop health policy that is informed by research evidence. The network is key in supporting implementation of the European policy framework, Health 2020, and provides a good example of collaboration among countries on utilizing evidence to inform health policies *(33)*.

The evidence-informed approach continues to evolve as understanding and expertise increase *(34)*. Some authors promote use of the term EIP to emphasize that the decision-making process is person-centred rather than solely focused on scientific research, which, it has been claimed, has taken the humanity out of clinical practice *(35)*. Both approaches, however, recognize the importance of considering patients/clients' individual needs, unique values, preferences and circumstances in addition to the scientific evidence that supports and informs clinical decision-making.

The real difference between these two approaches in health care remains open to debate. For this reason, the broader concept of EBP is used in this guide.

3. BENEFITS OF EBP

The number of research studies that strive to describe the benefits of making evidence-based decision-making standard practice in health systems is vast. EBP is a complex phenomenon and it is difficult to prove direct causal relationships between the structure of EBP and outcomes in health care. Currently, research mainly focuses on specific interventions and their outcomes. Evidence on the benefits of EBP consequently is mainly indicative. EBP nevertheless has the potential to improve quality of care and produce benefits for patients, nurses and midwives, and the health-care system. It is imperative for countries in the WHO European Region to consider the benefits of EBP and focus on continuous improvement in quality of care.

The countries of the Region have a wide range of health-system structures and show significant variability in health-care expenditure *(36)*. Regardless, the burden of unsafe care is a serious global health issue and a challenge in all countries, making it imperative that policy-makers continue to critically evaluate the quality and safety of care *(37)*. Health systems that achieve major gains in patient safety, effectiveness of health-care practices, timeliness of treatment, efficiency and equitability of health-care services, and provide patient-centred care can improve the quality of health care and ultimately better meet patients' needs *(38)*.

Issues around quality and safety in health care are discussed in Infobox 3.

Infobox 3. Quality and safety in health care

The concepts quality and safety in health care cannot be separated. According to the Agency for Healthcare Research and Quality *(39)*, safety is a component of quality.

Quality of care is: "the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" *(38)*.

Patient safety is defined as the absence of preventable harm to a patient during the process of health care *(40)*.

Benefits of EBP have been divided into benefits for the general population, nurses and midwives, health-care systems, and research and education. They are synthesized in Table 1 and described briefly below.

Benefits for the general population

Implementing EBP creates the conditions for patient-centred care, which is defined by Berwick *(41)* as:

> the experience (to the extent the informed, individual patient desires it) of transparency, individualization, recognition, respect, dignity, and choice in all matters, without exception, related to one's person, circumstances, and relationships in health care.

Patient preferences and values are essential cornerstones of EBP, requiring patient involvement and sharing of the information they need to make informed decisions

Table 1. Benefits of EBP

Beneficiary	Benefits
General population	• Improved conditions for patient-centred care • Patient preferences included in decision-making • Consistent health services leading to better equity • Reduction in geographic variation • Reduction in patients' length of stay • Better patient outcomes • Quality health-care services • Increased patient safety
Nurses and midwives	• Increased job satisfaction • Empowerment • Improved skills to integrate patient preferences into practice • Support for professional growth • Continuous career development through expert roles
Health-care systems	• Improvement in the quality of care • Better outcomes for patients • Increased patient safety • Reduced costs • Stronger basis for health-care investment decisions • Capacity-building through collaboration
Research and education	• Increased need for production and synthesis of robust evidence • Competence development • Integration of nursing and midwifery expert roles in health systems

Source: © Nursing Research Foundation.

about their care and promote their health *(42)*. Carter et al. *(43)* propose a framework for health promotion that combines the domains of evidence, ethics and values in health promotion-related decision-making. This approach may enable EBP to be more ethical, and ethically sensitive practice to be more effective *(43)*.

Including patient preferences in the decision-making process ultimately has a positive impact on the outcomes of care and health promotion *(44)*. Successful implementation of EBP enables patients to experience quality health-care services with better outcomes and increased safety *(45–51)*.

Example 5. Involving patients in decision-making
Swift & Callahan's *(44)* meta-analysis summarizing data from over 2300 clients across 26 clinical trials and other quantitative studies found that patients who were matched to their preferred psychological treatment had a 58% chance of showing greater outcome improvement and were half-less likely to discontinue treatment compared to those who were not matched. The quality of the included studies in this meta-analysis is nevertheless unclear, so the results are mainly indicative.

Consistency and the standardization of health-care practices enable patients to receive the best possible care regardless of where they live. Consistency can be promoted through, for instance, evidence-based clinical-practice guidelines, the use of which can realize benefits such as reduction in patients' length of stay in health-care facilities *(52)* and reduction in geographic variation in health-care delivery *(45,53)*.

Example 6. Evidence-based guidelines to promote patient safety
Health-care-associated infections represent the most frequent adverse event affecting patient safety worldwide. WHO has published a global evidence-based guideline on preventing surgical-site infections that is suitable for local adaptation in all countries *(54)*. The guideline includes 29 recommendations for prevention and guidance on how to disseminate and implement the guideline.

Benefits for nurses and midwives

Health professionals' strong belief in the value of EBP correlates with increased levels of EBP implementation, job satisfaction *(55)* and group cohesion *(28)*. Nurses and midwives who believe in their ability to deliver high-quality care may feel more empowered in their roles and may experience increased cohesion in team structures as they strive towards a common goal of EBP *(28)*. Continual development of nurses' and midwives' skills in EBP can help them integrate patient preferences into practice and deliver patient-centred care *(42)*. Working environments that lack EBP and prevent nurses from reaching their full potential do not support the continued professional growth of nurses, which may result in lower nurse satisfaction and lower compliance with best nursing practices *(56)*.

Nurses and midwives play a crucial role in surveillance and coordination activities that reduce adverse patient outcomes, so are key professionals in improving health-care quality *(57)*. Health systems should promote a systematic preventative approach to reducing risks associated with unsafe care and adverse events that ultimately may cause harm to patients *(38,58)*. Simply identifying patient safety issues is not sufficient: there is also a need to implement EBP and create a health-care culture that promotes continuous development *(58)*.

Benefits for health-care systems

The Member States of the WHO European Region, including those with limited health-care expenditure and which lack effective health-care system structures, can benefit from EBP. The benefits of EBP in countries with insurance-based health-care systems are well known, and health-care providers are being incentivized to implement EBP through mechanisms such as pay for performance *(47,59)*.

Example 7. Pressure ulcer prevention
Hospital-acquired pressure ulcers are included in the United States Centers for Medicare and Medicaid Services non-payment policy *(60)*. Pressure ulcers have negative consequences for patients and result in costly hospital settlements. The non-payment policy increased hospitals' adoption of EBP for pressure ulcer prevention, such as preventative quality-improvement interventions *(50)*.

Health systems can benefit directly from EBP through overall improvement in the quality of care; this means better patient outcomes and increased patient safety *(45–51)*. EBP can create economic benefits through reductions in health-care costs *(51,59,61)*.

Example 8. Advancing EBP in the hospital setting
An EBP project to reduce contamination of blood cultures that had been undertaken in one intensive care unit was adopted throughout the hospital, resulting in an estimated annual saving of £4.5 million. The savings were a result of reduced administration of antibiotics and laboratory testing, and earlier patient discharge *(61)*.

Health systems that invest in education programmes to improve nurses' and midwives' skills in EBP may benefit from lower turnover rates and greater nurse and midwife satisfaction, resulting in cost savings *(62)*. This is important for Member States to consider: many countries are currently characterized as having shortages of nurses and midwives, which can ultimately have an adverse impact on the health and well-being of populations *(63)*.

Improvement in health-care quality enables the development of a healthier, and consequently more productive, population. EBP is not just another highly advanced and extremely expensive western innovation, but an approach that can assist countries experiencing desperate health situations to develop creative and innovative solutions that ultimately benefit patients *(64)*. EBP interventions can provide policy-makers with reliable evidence and tools on which to base their health-care investment decisions. Organizational leaders who work in under-resourced environments can build capacity for EBP and improve practice through international collaboration, improvement in research networks, and creative and innovative approaches that engage staff to utilize evidence *(62)*.

Benefits for research and education

Necessary resources for research and development must be allocated to address the research-to-practice gap. As EBP becomes a standard of care, increased production and synthesis of robust evidence in nursing and midwifery will be needed. Nursing and midwifery have their own body of knowledge to guide decision-making in clinical practice. Implementation of EBP is complex and requires much more than simply utilizing research in daily practice. Member States should strive to share knowledge of good practices and support each other in implementing EBP.

Example 9. Dissemination of good practice in nursing and midwifery
Dissemination of good practice and innovations at national and international levels is very important. The WHO Regional Office for Europe published the European compendium of good practices in nursing and midwifery, which includes several examples on improving workforce capacity, professional education and strengthening health-care services, in 2015 *(65)*. Its aim is to improve the health and well-being of populations, reduce inequalities and ensure people-centred health systems.

EBP has contributed to a major paradigm shift in health-care education and practice. Nurses' and midwives' competence in analysing the best available evidence prior to making recommendations for change in nursing practice has developed over time *(66)*. The integration of nursing and midwifery expert roles in health-care organizations continues to be of vital importance. These experts, along with researchers, can design and undertake studies that help nurses and midwives make evidence-based decisions on how to prevent health problems or address existing problems *(67)*.

Future health-care professionals need to be sufficiently prepared to work in health-care environments that strive to enable evidence-based decision-making by professionals to be integrated in daily practice. This requires EBP and its related concepts to be incorporated into the education curricula of nursing and midwifery programmes *(56)*.

Example 10. Integration of EBP into education curricula

The curriculum model in the preregistration nursing programme at Glasgow Caledonian University, United Kingdom (Scotland) *(68)*, places the student at the centre, around which the objectives, content and mode of delivery of the programme are structured. Core values of the programme include EBP in support of Health 2020 goals *(1)*. The curricular framework is designed to support nurses to adopt an evidence-based approach to their nursing practice, embedding current knowledge (while acknowledging patient preferences) into common care decisions to improve care processes and patient outcomes.

EBP is one of the programme's six curricular themes, with an EBP module in each year or level of study. Following a progressive pathway, students are initially introduced to scientific enquiry and the role of EBP in nursing. They then learn about types of evidence in EBP in nursing, how to source research articles using key databases, and how to read and understand journal articles. Students develop their literature-searching and scientific-writing skills, and are supported in investigating topics with a global or public health focus.

Students acquire a range of research and scholarly skills, which they are encouraged to apply to their clinical learning experiences and theoretical studies as they progress through the programme. They exit the programme as graduate nurses who possess critical reading skills for quantitative and qualitative research evidence to support change in practice, and an appreciation of involving patients in shared decision-making for best possible outcomes.

Example 11. Incorporating EBP into education

EBP is incorporated into education at Cardiff University School of Healthcare Sciences, United Kingdom (Wales), in several ways. It is an integral part of undergraduate programmes, and students at master's level have an option of undertaking a systematic review or work-based (implementation) project for their MSc dissertation *(69)*. The professional doctorate programme *(70)* also includes a mandatory systematic review module: this is currently being revalidated to incorporate implementation science to encourage students to consider how to put synthesized evidence into practice.

4. IMPLEMENTING EBP IN NURSING AND MIDWIFERY

New innovations and practices are presented to improve outcomes in nursing and midwifery. Health-care innovation can include the introduction of a new concept, idea, service, process or product that aims to improve treatment, diagnosis, education, outreach, prevention and research, with the long-term goal of improving quality, safety, outcomes, efficiency and costs *(71–73)*.

Innovations in health care can be divided into products, processes and structures *(72)*. Products typically consist of technology or services, such as clinical procedures. A process refers to a new change to the production or delivery of care. Structures usually affect the internal and external infrastructure of health-care organizations and create new structural models *(73)*. To be called an innovation, an idea must be replicable and satisfy a specific need. Innovations must have sound scientific justification to be facilitators of EBP. In other words, careful consideration of expected and unexpected outcomes and effectiveness based on current evidence is required when presenting new innovations, such as technology, in nursing and midwifery practice. Implementation should be encouraged for innovations that have proven feasible, appropriate, effective and meaningful *(8)*.

Several models have been developed to facilitate the implementation of change in health care. Models and frameworks are used to illustrate EBHC and EBP *(4)*. Models can be targeted towards specific phases of EBP, focusing on the organization or practitioner. Some (such as Jordan et al. *(8)*) are generic models that describe the whole process of EBP from research to practice. Others focus on organizational features that support EBP or implementation of evidence throughout the system. The models are not the main point in the development process, but are facilitators of change. Models that support organizational change are particularly useful tools for improving and developing EBP.

Currently, an abundance of scientific knowledge is communicated through journals, databases and so-called grey literature. Cooperation is therefore needed to critically evaluate and synthesize current research into systematic reviews and clinical-practice guidelines. International collaborators such as Cochrane and the JBI have developed methodologies for evidence synthesis of different types of research to support the implementation and dissemination of evidence. In addition, multiple national organizations produce systematic reviews, clinical-practice guidelines and methodological guidance for evidence synthesis (see Annex 1).

Example 12. JBI collaborating centres in Europe
The 15 JBI collaborating centres in Europe (2017 figure) *(74)* synthesize evidence and produce systematic reviews and implementation reports. The Wales Centre for Evidence Based Care, for example, a JBI centre of excellence, focuses on conducting evidence synthesis and teaching health-care professionals how to undertake comprehensive systematic reviews. The centre is also working with a local health board on a project to implement research findings at local level *(75)*.

Example 13. Handbook for guideline development
Clinical-practice guidelines present an important tool for providing best available evidence to facilitate implementation of EBP. A methodology has been developed to ensure the high quality of clinical-practice guidelines: the *Estonian handbook for guidelines development (76),* for example, covers all aspects of guideline development, applying current internationally accepted methods at national level.

International cooperation, along with national improvements, creates structures that support the development of EBHC and make evidence available for transfer and implementation. There is nevertheless a need to reform management practices in health-care services at national, regional and local levels towards supporting the development of evidence-based nursing and midwifery. This requires the creation of *specific national, regional and local structures* in the following areas (Table 2) to:

- produce, disseminate and implement knowledge
- develop consistent practices
- ensure the continuing development of nurses' and midwives' competence.

Table 2. Responsibilities at different levels of health-care systems for developing consistent EBP

CONTENT	National level	Local level	Organizational level	Individual nurse/midwife
Producing, disseminating and implementing knowledge	Policy and strategies for EBP: • research policy (important research topics are described) • databases for synthesized evidence • responsibility to produce synthesized evidence • national guidelines for nursing and midwifery	Plans for implementation and development of systematic reviews and guidelines: • local networks • structures for evidence dissemination	Participation in local networks: • evidence dissemination • availability of synthesized evidence	Evidence-based nursing/ midwifery practice: • evidence-based decision-making
Developing consistent practice	Support for evidence synthesis: • research and education • development projects • evaluation and follow-up of EBP	Responsibilities for consistent practices: • guideline implementation • evaluation and follow-up of EBP	Development of evidence-based consistent practices: • evaluation and follow-up of EBP • participation in development projects • benchmarking	Commitment to evidence-based consistent practice: • nursing/midwifery documentation • evaluation of patient care
Ensuring competence	Competence needed for EBP: • support for competence development • model for using different kinds of expertise in practice	Plans to strengthen competence for EBP: • collaboration with local research and educational institutions	Methods to evaluate nurses'/midwives' competence for EBP: • collaboration with local educational institutions: e.g., curriculum development, continuing education	Development and evaluation of own expertise and competence

Source: Holopainen et al. *(77).* Reproduced by permission of Fioca Ltd.

National-level collaboration is required to ensure consistent structures in the development of evidence generation and consistent requirements for curriculum development. The utilization of synthesized evidence produced through international cooperation requires national strategies and multidisciplinary collaboration prior to evidence dissemination and implementation. National insitutions' and organizations' further responsibilities on the production of clinical-practice guidelines and other forms of evidence should be agreed.

Example 14. The national-level support system for dissemination of evidence-based nursing and midwifery practice in Finland

The Ministry of Social Affairs and Health provides guidance on strategic action plans for nursing (responsibilities) and has initiated nationwide development of EBP in nursing and midwifery by producing since 1998 national strategic action plans that promote shared understanding, aims and responsibilities *(78–80).*

The National Institute for Health and Welfare continuously gathers health, welfare and service-related data (through, for instance, nationwide surveys) and produces comparable knowledge for national, regional and local purposes.

The Nursing Research Foundation promotes the effectiveness of nursing and midwifery practices by developing EBP in accordance with national policies and produces national evidence-based, clinical-practice guidelines for nursing and midwifery.

The Finnish Medical Society produces national evidence-based, clinical-practice guidelines covering medical treatments and disease prevention.

National recommendations suggest that EBP and decision-making should be included in nursing and midwifery education curricula *(81).*

Consistent methodologies for evidence synthesis need to be defined to support the generation of evidence adapted to local contexts. It is recommended that international guidelines methodology be utilized in this work. Successful implementation of a clinical-practice guideline developed in another culture requires successful translation of the guideline to meet local needs and fit the local context. One option for guideline development to increase utilization of existing guidelines and reduce duplication efforts is guideline adaptation (Infobox 4) *(82).*

Infobox 4. Guideline adaptation process

ADAPTE is a systematic approach to endorsing and/or modifying a guideline produced in one cultural and organizational setting for application in a different context *(82).* The ADAPTE process includes three main phases:

- the set-up phase provides information on the necessary skills and resources: the task that needs to be completed prior to the adaptation process is described;
- the adaptation phase includes topic selection, searching for and retrieving guidelines, assessing the quality, relevance, content and applicability of the guideline, and deciding to reject or accept the whole guideline (or part of it) for the draft adapted version; and
- the final phase provides guidance through external review and plans for updating and production of the final guideline.

Collaboration at *local level* enables effective knowledge transfer of best practices and identification of local needs for development. It is recommended that health-care organizations and education institutions actively participate in collaboration to improve the knowledge base and care outcomes in the Region. At regional level, nursing and midwifery managers decide on strategic directions for the development of consistent EBP and coordinate implementation of national strategies.

Example 15. A regional network for dissemination of evidence
Patient safety can be advocated through the promotion of consistent fall-prevention practices. Fall-prevention efforts require a multidisciplinary regional-level approach in which different types of health-care organizations are encouraged to collaborate. A regional-level project was undertaken in Finland to develop consistent practices in fall prevention. A regional fall-prevention network was created, involving 27 actors from 10 organizations with the goal of promoting awareness among patients, families, and social and health-care personnel. The goal was reached through education and training, monitoring the number of falls within organizations, promoting consistent EBP and producing guidelines *(83).*

Organizations have responsibility for establishing the necessary structures to support EBP, ensuring health professionals' competency, collecting information on care outcomes and changing practices if needed. They also should develop evidence-based tools to enable managers to receive feedback on EBP compliance. The central factor in successful dissemination of evidence is having effective communication channels in the organization. The development of consistent EBP in nursing and midwifery requires that nursing and midwifery staff are aware of evidence-based, clinical-practice guidelines, systematic reviews and recommendations that form the basis for consistent practice and good patient care. Organizations should also maintain a positive culture for EBP (see Section 5).

A misunderstanding exists concerning the process of utilizing evidence. *Nurses and midwives* may believe, as was previously understood, that they should define the problem themselves, search for studies, appraise their methodological quality, interpret the accepted studies and make conclusions before applying the synthesized evidence to practice *(84)*. Such misunderstandings cause barriers to EBP implementation due to ever-increasing workloads and simultaneous shortages of staff. Other barriers have been identified as organization, leaders and management, professionals and evidence
It is important to recognize these barriers to enable utilization of evidence *(85)* (Table 3).

The movement currently is towards the transformation of research knowledge into clinical recommendations by expert panels. Recommendations are embedded in the clinical practice of health-care systems to enhance utilization of evidence *(21,90)*. The main phases are:

1. identifying and accessing the best evidence available in decision-making
2. using evidence in care decisions
3. practising according to the decision made.

Table 3. Main types of barriers to EBP

Types of barrier	Examples
Organization	• Insufficient support from management • Lack of support structures and limited resources and tools • Lack of organizational culture to support EBP • Outdated organizational policies • Hierarchical structures • Lack of multiprofessional collaboration • Outdated and unquestioned routines • Resource shortages
Leaders and management	• EBP not defined as an aim of the organization • Insufficient commitment to EBP • Insufficient support for staff • Insufficient authority
Professionals	• Inadequate knowledge and skills in EBP • Unfamiliarity with guidelines • Negative attitudes • Preconceptions concerning EBP • Lack of time • Disagreement with guidelines
Evidence	• High-quality studies not available • Massive amount of information • Unclear clinical-practice guidelines • Guidelines not updated or incomplete

Sources: Melnyk et al. *(49)*; Alanen et al. *(86)*; Solomons et al. *(87)*; Dalheim et al. *(88)*; Brämberg et al. *(89)*.

It is important that nurses and midwives make a commitment to EBP and update their clinical competence by regularly following professional sources of evidence in their field. Individual nurses and midwives need to develop the necessary skills required to access the best available evidence and use evidence appropriately in clinical practice.

At organizational level, managers and expert nurses and midwives are making sources of synthesized evidence accessible to nurses and midwives *(27)*. The titles, roles and tasks of experts in health care, such as advance practice nurses and nurse practitioners, are, however, inconsistent nationally and globally. At national level, lack of consistency impedes identification and utilization of competencies in nursing and midwifery, thereby inhibiting evaluations of the effects of expert positions on patient, staff and organizational outcomes *(91)*. There is a need to define roles and consequent requirements for competencies to enhance collaboration in the development of EBP.

Current understanding of EBP is based on collaboration between health professionals with different competencies *(92)*. The Action Model of Expertise (AME) was introduced as a means of facilitating EBHC in Finland. It consists of the roles of four different types of experts and their core competencies, with special emphasis on EBP and actions for its implementation (Table 4).

Table 4. AME

Experts' roles in EBP	Nurses in clinical care	Specialized nurses in clinical care	Clinical nurse specialists[a]	Specialists in clinical nursing science
Core competencies	• Advanced clinical competency • Skills to apply evidence into practice • Acquainted with the context (unit level)	• Advanced specialized clinical competency • Skills to apply evidence into practice and utilize it in a specialized area • Developmental skills acquainted with the context (several units and department level)	• Advanced clinical competency in a certain clinical area • Advanced developmental skills • Research skills • Acquainted with the context (department or hospital level)	• Expertise in conducting scientific research • Can organize clinical research and development projects • Leader of clinical research • Acquainted with the context (department, hospital, national and international level)
Emphasis of competency	Competencies in clinical nursing and patient- or client-oriented implementation of EBP		Competencies in development and research in generation and dissemination of EBP	
Actions in implementation of EBP	• Utilize EBP knowledge in patient or client care • Maintain and develop own expert knowledge	• Utilize EBP knowledge in patient or client care and facilitate implementation in own specialized area • Disseminate EBP knowledge in own specialized area • Maintain and develop own expert knowledge	• Apply scientific knowledge • Develop consistency of EBPs at unit and regional levels • Develop, disseminate and monitor clinical practices • Maintain and develop own expert knowledge	• Search, appraise and synthesize evidence, develop measurement tools, disseminate evidence into practice • Evaluate EBP and conduct intervention and effectiveness research • Support development by different types of experts • Maintain and develop own expert knowledge
Focus of action	Patient/client		Staff/organization	

[a] Clinical nurse specialists include advanced nurse practitioners (such as nurse practitioners).
Source: Nursing Research Foundation *(93)*, modified from Ministry of Social Affairs and Health *(79)*.

The key point of the AME is seamless collaboration between different types of experts. The model allows all experts to focus on their own basic duties, whether direct patient care or disseminating evidence into practice. EBP is carried out directly at the point of care; specialized nurses and nurses in clinical care work with patients and need evidence-based knowledge in a synthesized form through, for example, systematic reviews and guidelines. Clinical nurse specialists and specialists in clinical nursing science[1] are involved in searching, appraising, synthesizing and disseminating evidence for clinical practice. Issues such as organizational culture, managerial support and career paths that accommodate clinical and research work need to be addressed in the professional development of expert nurses *(27)*.

1 Clinical nurse specialists are advanced nurse practitioners, usually educated to master's level, who work in clinical settings with patients. They have basic research skills that allow them to search and disseminate synthesized evidence and strengthen EBP. Specialists in clinical nursing science are more research-oriented. Usually they are educated to doctoral level. They lead implementation projects, evaluate EBP and are instrumental in disseminating EBP across organizations and at local and national levels.

The AME model indicates the focus of action of different types of experts: that of nurses and specialized nurses in clinical care, for instance, is on patients and clients as a means of utilizing evidence in their care, while that of the next two expert groups, clinical nurse specialists and specialists in clinical nursing science, is on staff and the organization through the dissemination of evidence-based knowledge, facilitation of implementation and the development of care. In addition to the types of experts mentioned in the AME model, there are groups of professional nurses whose competency in implementing and developing EBP is still evolving. Globally, there continues to be inconsistency in the titles, roles and tasks of different types of experts.

Example 16. The post-registration career development framework in United Kingdom (Scotland) *(94)*

The framework supports the continuing and changing development needs of the nursing, midwifery and allied health professional workforce. It identifies five levels of expertise through key aspects of practice that are transferable across discipline-specific and specialty groups. The overview of each level provides a description of the attributes required and suggests the qualifications that might be expected. The four pillars of practice are: clinical practice; facilitation of learning; leadership; and evidence, research and development. Each of the pillars is divided into aspects of practice, including an evidence-into-practice section. Key aspects of practice are described at each level under the categories of examples of sphere of responsibility, key knowledge, skills and behaviour, and opportunities for educational and professional development.

Example 17. A process innovation at organizational level

The AME in EBHC was utilized in the improvement of evidence-based hand-hygiene practices. The Oulu University Hospital joined the Finnish centre of the JBI, hosted by the Nursing Research Foundation, in 2010. A collaborative development programme involving the hospital and the Foundation was established to pilot JBI implementation tools for EBP.

The programme was based on collaboration between a clinical nurse specialist and a specialist in clinical nursing science. The clinical nurse specialist worked as a nursing director in the hospital infection-control unit and had advanced skills and knowledge in infection control in hospital settings. The specialist in clinical nursing science had the role of bridging scientific and practical knowledge in EBP. She had expertise in developing and applying the JBI tools into the Finnish health-care context.

Nurses in the hospital who had specialized in infection control were recruited into a continuous quality-improvement project that involved regular evaluation of hand-hygiene practices, reporting findings on the JBI Practical Application of Clinical Evidence System (PACES) audit tool *(15)*, and planning the changes needed in collaboration with the unit director and department head. Participants also informed nurses in clinical care and other staff members on how to implement correct protocols in hand hygiene.

5. SUSTAINING AN EVIDENCE-BASED CULTURE IN HEALTH CARE

The development of EBP continues to be a current topic, with special emphasis on quality improvement and implementation of EBP in clinical decision-making *(4)*. A common characteristic of health systems is their changing nature, which requires a sustainable approach to health-care improvements *(8)*. To truly enjoy the benefits associated with EBP, countries in the European Region need to continuously strive to create, support and sustain an evidence-based culture in health care. Supporting a culture of EBP is vital in developing and developed countries, even though health priorities vary. Dans & Dans *(95)* justify the need for EBP in developing countries, which are characterized by limits in their resources and capacity for drug regulation and continuing medical education. EBP may, for example, facilitate the allocation of scarce resources to treatments that prove effective and ultimately save countries money on health expenses *(95)*. Prior to allocating resources in developing countries, policy-makers and health-care practitioners need to consider health-care priorities and the effectiveness, potential benefits and harms of interventions *(96)*.

Health-care environments are complex. No single, linear approach to implementation of EBP will succeed every time in moving evidence into policy and practice *(8)*. Local application and implementation of evidence requires a collaborative approach with stakeholder involvement and continuous analysis of community-level knowledge needs. Special emphasis should be placed on the importance of social, cultural and historical organizational and individual influences on clinical decision-making *(8)*. Health-care organizations operate in broader environments, so health-care environments (global, national, regional and organizations) must be assessed for their culture and readiness for implementing EBP *(28,97)*. Organizations should not only focus on identifying potential determinants that influence the use of evidence in practice, but also potential influential contextual factors, such as organizational culture and leadership *(23)*. The process of EBP begins with a spirit of enquiry, which can be described as an EBP culture and environment that encourages and supports an atmosphere in which clinical questions are asked routinely by health-care professionals *(47,49)*.

Health-care organizations are challenged by the epidemic of medical errors and unsafe care. The implementation of EBP is a key strategy for addressing this challenge through improving quality of care *(59)*. Organizations should focus on establishing an EBP culture, building capacity and ensuring sustainability for successful infusion of EBP *(8,98)*. High-reliability health-care organizations that provide safe and efficient care have much in common with an EBP culture. The characteristics of each include *(59)*:

- commitment to delivering high-quality care, patient safety and reduced costs
- strong leadership
- emphasis on process and systems design
- transdisciplinary teamwork
- effective communication
- delivery/standardization of best practices and policies
- an environment that promotes a spirit of enquiry and continuous learning
- focus on continual process improvement
- outcomes monitoring/evaluation.

Leaders have a responsibility to engage staff at all levels, support an EBP culture and allocate resources to provide the necessary infrastructure to enable EBP *(56,62)*. In the end, this can enhance a professional work environment in which professionals feel engaged in clinical decisions and have the skills to base their practice on the best available evidence *(56)*.

Example 18. Multifaceted EBP mentorship programme
A multifaceted EBP mentorship programme *(62)* included a two-day intensive workshop targeted at a core group of nurse leaders who were identified as most likely to become EBP mentors throughout the organization. The workshop aimed to improve attendees' ability to implement EBP in their units. The programme provided ongoing mentorship skill-building activities, such as an EBP luncheon workshop on ways to strengthen mentorship, a holiday tea-party to celebrate and support EBP mentors and nurse leaders, and interactive lectures on basic issues. Results suggest the programme may have lasting positive effects on nurses' perceptions of organizational culture, beliefs about EBP and implementation in practice.

Organizational context and culture

EBP results in quality patient outcomes when delivered in a context of caring that is supported by an organizational culture (Infobox 5) supportive of EBP *(28)*. The characteristics of context can be placed on a continuum of weak to strong, with the latter defining a context in which boundaries are clearly defined and in which there are:

- information and feedback systems in place
- appropriate resources
- clear understandings of power and authority
- appropriate and transparent decision-making processes
- indications of receptiveness to change *(22)*.

Infobox 5. Organizational culture

An organization's cultural knowledge "consists of the beliefs it holds to be true on experience, observation, and reflection about itself and its environment" *(99)*. The shared beliefs shape the organization's purpose and identity, and determine the value of new information and knowledge. Aspects of organizational culture provide the so-called feel of the organization and may be largely subconscious *(97)*.

The relationship between context and culture is complex. McCormack et al. *(22)* state that:

> an understanding of context as the specific environment in which implementation, utilisation and creation of evidence may take place makes it easier to understand culture as a characteristic of context and one that shapes the dynamic and changing nature of practice.

A better organizational culture leads to better processing of information, including evidence, which in turn has important effects on patient outcomes and safety *(99,100)*. Organizational culture can be identified and categorized into three typical patterns

according to how organizations process information (Table 5): pathological, bureaucratic and generative *(100)*. Pathological power-oriented organizations have low cooperation and information is used as a personal resource in power struggles. Bureaucratic organizations are rule-oriented, with modest cooperation. Information is spread through standard channels or procedures, but is prone to failure in exceptional or crisis situations. Generative organizations are performance-oriented, with alignment taking place through identification with the mission and new ideas being welcomed *(99)*. Conscious efforts are made to seek new information actively and maintain awareness among team members. Leadership plays a key role in supporting a generative culture in which awareness and empowerment replace suspicion, isolation and passivity *(100)*. Sustainability of EBP requires that it becomes a part of the organizational culture *(97)*.

Table 5. Information cultures affecting EBP

	Pathological: power-oriented	Bureaucratic: rule-oriented	Generative: performance-oriented
Noticing	Do not want to know	May not find out	Actively seeks information
Messengers	Messengers shot	Messengers neglected	Messengers trained
Responsibility	Responsibility is shirked	Responsibility is compartmentalized	Responsibility is shared
Sharing	Bridging is discouraged	Bridging is allowed but neglected	Bridging is rewarded
Failures	Failure is punished or covered up	Organization is just and merciful	Inquiry and reflection
New ideas	New ideas are actively crushed	New ideas present problems	New ideas are implemented
EBP	Threat to professional authority	Proceeds slowly and hierarchically	Actively developed and implemented

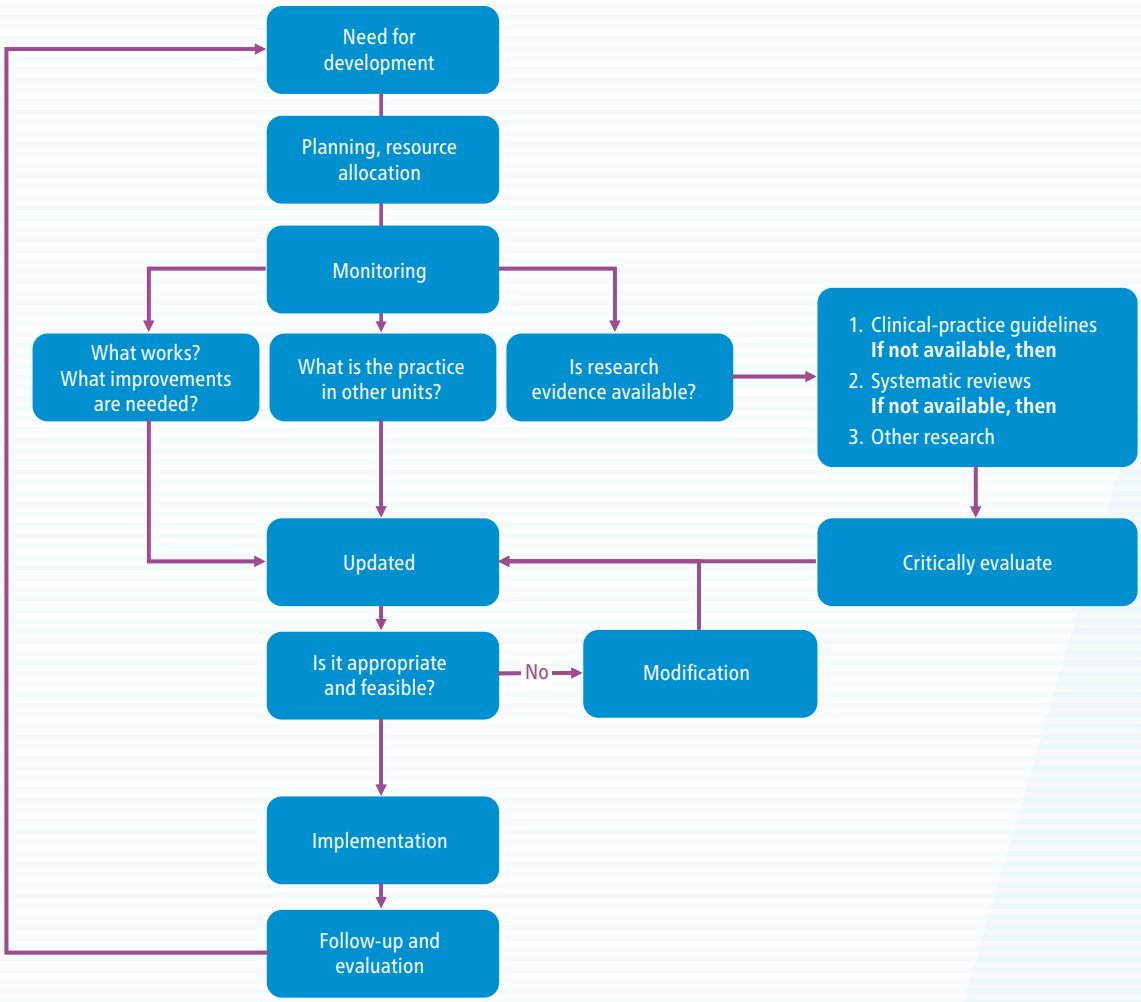
Sources: modified from Choo *(99)* and Westrum *(100)*.

The continuous development of EBP

The development or improvement of a certain health-care practice in an organization requires identification of the current practice *(101)*, knowledge needs *(8)* and potential barriers and obstacles to change *(102,103)* (Fig. 7).

It is imperative that a good understanding of the problem and target group is acquired *(102)*. The planning of a complex change needs to take into account the specific health-care context, nature of the innovation and characteristics of the professionals and patients involved *(103)*. Organizational readiness is the state of preparedness for change, which requires the necessary knowledge, skills, resources and support. The analysis of organizational readiness can be categorized into organizational culture, infrastructure and resources *(97)*.

Fig. 7.
The cycle of consistent practices



Source: © Nursing Research Foundation.

Part of the planning process includes mapping the current situation or practice. This can be done by asking the following questions.

- What works?
- What does not work?
- What is the practice in similar organizations?
- Is evidence available?

Different approaches to the categorization of evidence can be used, such as the JBI levels of evidence *(104)*. The JBI model of EBHC pictures the different forms of evidence that can be used in clinical decision-making: guidelines, evidence summaries, systematic reviews, discourse, expertise and research *(8)*. International databases (described in Annex 1) can be used in the search for systematic reviews or best-practice guidelines. The ADAPTE process presented in the previous chapter enables a systematic approach to

adapting guidelines developed in one setting to fit a different cultural and organizational context *(82)*. The available evidence should be assessed and utilized during the planning phase of a development or innovation. The feasibility of the new approach should be evaluated, and if it proves unfeasible, it should be modified appropriately *(8,101)*.

As Fig. 8 shows, the next step in the cycle of consistent practices is to support adoption of the innovation in practice. There are several models that help support clinicians in this vital phase.

A systematic approach to the adoption of consistent best practices should be taken to ensure the desired outcome. Pathman et al. *(105)* created the awareness-to-adherence model, which consists of steps relating to adherence to clinical guidelines – awareness, agreement, adoption and adherence (Infobox 6).

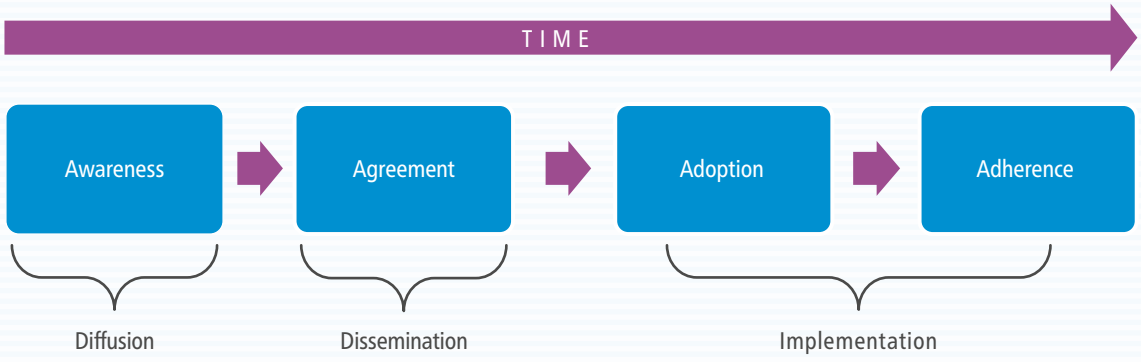
Infobox 6. The awareness-to-adherence model

The model *(105)* describes the cognitive and behavioural steps health professionals take prior to adherence to evidence-based guidelines. It includes the following steps:

- awareness: a professional has become aware of the guideline
- agreement: a professional intellectually agrees with the guideline
- adoption: a professional follows the guideline while caring for some patients
- adherence: a professional routinely follows the guideline for all applicable patients.

In the awareness stage, diffusion of the guideline or innovation takes place (Fig. 8). Diffusion is influenced by four main elements: the innovation, communication channels, time and the social system *(106)*. Five stages are included in the decision-making process: knowledge, persuasion, decision, implementation and confirmation *(106)*. Knowledge and information are spread during diffusion. This is followed by persuasion and decision-making, where the individual weighs the possible advantages and disadvantages associated with the innovation. In the last two stages, the individual tests and decides whether to continue using the innovation in practice.

Fig. 8.
Evidence transfer at the phases of the awareness-to-adherence model



Source: © Nursing Research Foundation.

The awareness stage requires nurse management to increase awareness through enhanced communication, marketing, a monitoring system and alerts for new information. This results in increased awareness among nurses and midwives *(101)*. The diffusion of innovation model can be used within the field of nursing to enhance the adoption of innovation relating to EBP *(107)*.

Dissemination of the innovation occurs in the agreement stage of the awareness-to-adherence model *(105)*. Dissemination is the "targeted distribution of information and intervention materials to a specific public health or clinical practice audience" *(108)*. In this stage, management should present a clear rationale for the innovation, which includes the risks, benefits and associated costs, and staff members' knowledge, attitudes and beliefs about the innovation should be assessed *(101)*. The adoption and adherence stages involve implementing the change into daily practice. Implementation is the "use of strategies to adopt and integrate evidence-based health interventions and change practice patterns within specific settings" *(108)*. To enhance adoption and adherence, management should provide clear instructions on the desired change, strive to promote consistent practices and inform stakeholders of changes. Leaders should strive to motivate, train and provide incentives to staff members. Management should have a plan for continuous evaluation of outcomes *(101)*.

Adherence routinely occurs for only an estimated one third of evidence in the awareness-to-adherence model *(109)*. It is important to consider the complexity of adoption of EBP when planning an innovation. Successful adoption and sustainability of EBP requires its adoption by individual care providers, leaders and policy-makers *(4)*. Individual team members cannot support and sustain EBP practices successfully on their own: a collaborative approach is necessary *(8)*. It is important that management, along with nurses and midwives, identify their roles and responsibilities in the process of EBP development and in sustaining a culture that supports EBP *(1)*.

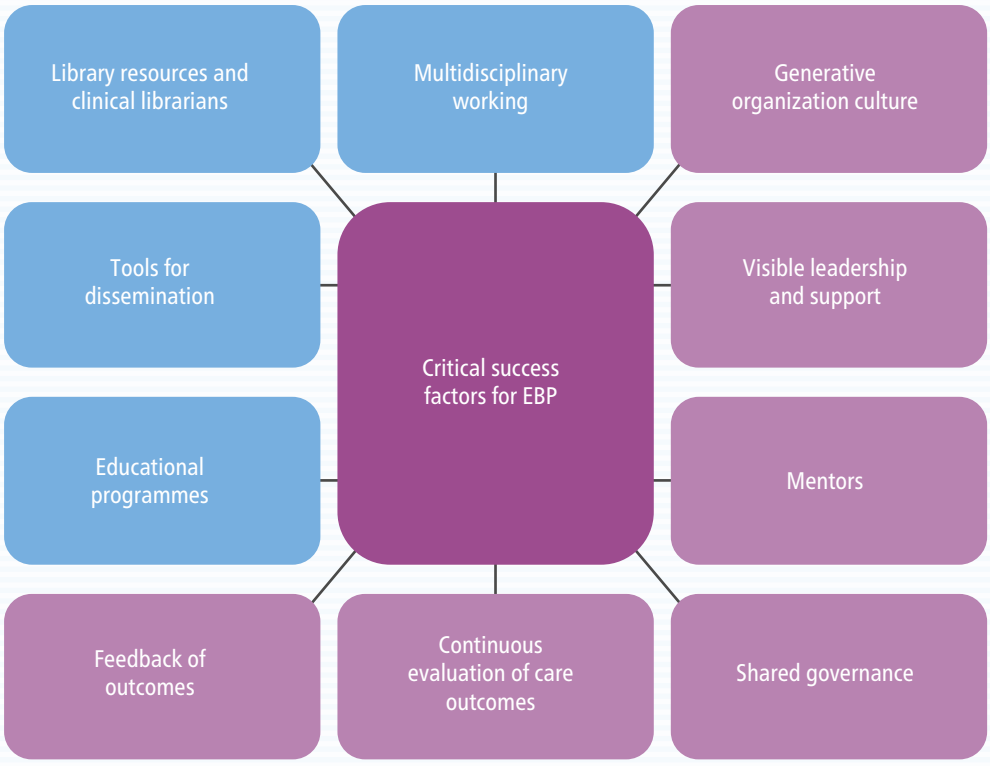
6. SUCCESS FACTORS

It is essential for nurse and midwife managers to commit to the development of consistent nursing and midwifery practice. The use of evidence-based nursing and midwifery guidelines, systematic reviews and recommendations require a new way of thinking, with recognition of the most reliable available evidence that can be applied to clinical practice. Collaboration between health-care organizations and education institutions is a prerequisite to promoting nurses' and midwives' competence in EBP.

Staff competence and their understanding of the basic principles of EBP are important success factors for the implementation of EBP in health care. Improvement opportunities should be offered to staff members so they can take part in developmental work, such as evidence synthesis and implementation projects that facilitate EBP and improve practice and other activities that influence patient outcomes. All actors, however, should have specified roles in the development of EBP to guarantee seamless collaboration.

Fig. 9 presents essential success factors for implementing and maintaining a successful EBP infrastructure. Six are associated with management: generative organization culture, shared governance, mentors, feedback of outcomes, visible leadership and support, and continuous evaluation of care outcomes. Nurse leaders in the organizations in which the Fitzsimons & Cooper study took place were advocates of EBP and allocated

Fig. 9.
Factors associated with successful EBP infrastructure



Source: modified from Fitzsimons & Cooper *(61)*.

the necessary resources for implementation. They strived to engage staff in EBP through feedback on patient outcomes *(61)*.

Success factors for EBP include integrating the use of EBP mentors in practice. Mentors play a significant role in implementation through their belief in EBP and ability to engage frontline staff. Shared governance consists of involving and accounting for frontline staff members' perceptions of commitment to, and implementation of, EBP. Staff should be encouraged to participate in EBP projects and decisions that affect the care they provide. Successful EBP infrastructure also requires attention to library resources and clinical librarians, tools for dissemination, multidisciplinary working and educational programmes to ensure successful implementation of EBP *(61)*.

The ultimate goal of promoting EBP and innovation in health care is to ensure the delivery of equitable, affordable, patient-centred and high-quality health-care services to the entire population. EBHC aims to improve the health and safety of patients while providing care in a cost-effective manner to improve outcomes for patients and health systems. Based on this guide, the following recommendations are offered to support successful development of EBP in nursing and midwifery.

Recommendations

Recommendation 1.
Define national and local structures that support evidence synthesis

Although an increasing amount of research is being conducted, reliable synthesized evidence is not available for all topics in nursing and midwifery practice. When evidence is not available, the predefined hierarchy of evidence and knowledge of the type of evidence that guides current practice needs to be clearly defined at national level. In terms of quality of evidence, it is important that independent national institutions or organizations are responsible for evidence synthesis and adapting evidence to local health-care settings and organizations.

Recommendation 2.
Identify necessary roles and competencies for the EBP process

Professionals in different positions at different levels in health care have their own important roles in the process of evidence-based health care. These roles are defined at organizational level to facilitate effective dissemination and implementation of reliable evidence. The roles often require different levels of education, competencies and authorized scopes of practice. Health-care policy-makers and leaders in nursing and midwifery should clearly identify them, using structured frameworks such as the AME model presented in Chapter 4. A collaborative approach is necessary to ensure implementation of EBP.

Recommendation 3.
Ensure a shared understanding of EBP in organizations

While nursing and midwifery increasingly rely on evidence-based knowledge, special attention must be paid to upgrading the skills and competencies of managers and other health-care professionals. Nurse and midwife managers should ascertain that the practices and methods used in nursing and midwifery are based on the best available

evidence and that care practices are consistent across units and organizations. Nursing and midwifery staff should also be aware of the best available evidence and know how to use it to influence care decisions. Professionals in nursing and midwifery need to adopt a reflective and critical approach to clinical practice to create more effective and meaningful care processes.

Recommendation 4.

Ensure that EBP principles form the foundation of education and training in nursing and midwifery

Education plays a central role in the development of EBP. Nursing and midwifery students need to achieve a basic understanding of EBP and its purpose through education and training, along with an understanding of their role in EBP. Nursing and midwifery education curricula should integrate the best available evidence into teaching, and educators should encourage students to adopt a more reflective and critical approach to current practice. Those working in education and research should provide the necessary support for efforts aimed at promoting evidence-based nursing and midwifery. Nursing and midwifery managers should work closely with experts in education and research to draw up long-term strategies to facilitate the adoption of EBP.

Recommendation 5.

Integrate EBP in the organizational culture

It is imperative to introduce and sustain a work culture that supports EBP throughout health-care organizations and units so that EBP becomes an integral part of daily activities and decision-making in nursing and midwifery. Managers act as role models in use of evidence in decision-making and their attitudes towards utilization of evidence has an impact on the attitudes of staff. An organization that is open to the development of work practices in accordance with current evidence will strive to seek new information, promote awareness among stakeholders and disseminate effective practices throughout the organization. Leadership plays a key role in supporting an organizational culture that encourages awareness and empowerment and in which new ideas are welcome.

Recommendation 6.

Establish continuous evaluation of care outcomes

The monitoring and evaluation of success in implementing EBP is a vital process that offers valuable information for developmental purposes. The evaluation process should be clearly defined and planned and include identified responsibilities and data-management plans. Observation may appear to be a feasible and appropriate method during data collection, but the utilization of existing data sources, such as patient records, should also be considered. The evaluation of compliance with, and adherence to, guidelines provides comprehensive data about EBP and assists in identifying gaps in implementing evidence. Information is also required on how updated practices affect care outcomes from different perspectives, such as patient outcomes, nursing or midwifery outcomes, and possible financial costs.

REFERENCES

1. European strategic directions for strengthening nursing and midwifery towards Health 2020 goals. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/en/health-topics/Health-systems/nursing-and-midwifery/publications/2015/european-strategic-directions-for-strengthening-nursing-and-midwifery-towards-health-2020-goals, accessed 2 July 2017).
2. Quality of care: a process for making strategic choices in health systems. Geneva: World Health Organization; 2006 (http://apps.who.int/iris/handle/10665/43470, accessed 2 July 2017).
3. Pearson A, Jordan Z, Munn Z. Translational science and evidence-based healthcare: a clarification and reconceptualization of how knowledge is generated and used in healthcare. Nurs Res Pract. 2012;1–6. doi:10.1155/2012/792519.
4. Stevens K. The impact of evidence-based practice in nursing and the next big ideas. Online J Issues Nurs. 2013;18(2):4. doi:10.3912/OJIN.Vol18No02Man04.
5. Jun J, Kovner CT, Stimpfel AW. Barriers and facilitators of nurses' use of clinical practice guidelines: an integrative review. Int J Nurs Stud. 2016;60:54–68. doi:http://dx.doi.org.pc124152.oulu.fi:8080/10.1016/j.ijnurstu.2016.03.006.
6. Scott K, McSherry R. Evidence-based nursing: clarifying the concepts for nurses in practice. J Clin Nurs. 2009;18(8)1085–95. doi:10.1111/j.1365-2702.2008.02588.x.
7. Spector N. Evidence-based nursing regulation: a challenge for regulators. J Nurs Regul. 2010;1(1):30–6.
8. Jordan Z, Lockwood C, Aromataris E, Munn Z. The JBI model for evidence-based healthcare: a model reconsidered. Adelaide: The Joanna Briggs Institute; 2016 (http://joannabriggs.org/assets/docs/approach/The_JBI_Model_of_Evidence_-_Healthcare-A_Model_Reconsidered.pdf, accessed 2 July 2017).
9. Pearson A, Wiechula R, Court A, Lockwood C. The JBI model of evidence-based healthcare. Int J Evid Based Healthc. 2005;3(8):207–15.
10. Khangura S, Konnyu K, Cushman R, Grimshaw J, Moher D. Evidence summaries: the evolution of a rapid review approach. Syst Rev. 2012;10(1):10. doi:10.1186/2046-4053-1-10.
11. Institute of Medicine. Clinical practice guidelines we can trust. Washington (DC): National Academies Press; 2011.
12. Enabling breastfeeding for mothers and babies. In: Cochrane Library Special Collection [website]. London: The Cochrane Collaboration; 2017 (http://www.cochranelibrary.com/app/content/special-collections/article/?doi=10.1002/14651858.10100214651858, accessed 2 July 2017).
13. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: World Health Organization; 2016 (http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/anc-positive-pregnancy-experience/en/, accessed 2 July 2017).
14. Korhonen A, Ojanperä H, Puusti T, Järvinen R, Kejonen P, Holopainen A. Adherence to hand hygiene guidelines – significance of measuring fidelity. J Clin Nurs. 2015;24(21–22):3197–205. doi:10.1111/jocn.12969.
15. Operational model: hand hygiene practice evaluation and development. In: Evidence-based operational models [website]. Helsinki: Nursing Research Foundation; 2017 (http://www.hotus.fi/hotus-en/evidence-based-operational-models, accessed 2 July 2017).
16. Sackett DL, Rosenburg WMC, Muir Gray JA, Haynes RB, Richardson WS. Evidence-based medicine, what it is and what it isn't. Br Med J. 1996;312:71–2. doi:https://doi.org/10.1136/bmj.312.7023.71.
17. Sackett DL, Richardson WS, Rosenberg W, Haynes B. Evidence-based medicine: how to practice and teach EBM. Edinburgh: Churchill Livingstone; 1997.
18. Newhouse RP, Spring B. Interdisciplinary evidence-based practice: moving from silos to synergy. Nurs Outlook 2010;58(6):309–17. doi:10.1016/j.outlook.2010.09.001.
19. Kelly MP, Heath I, Howick J, Greenhalgh T. The importance of values in evidence-based medicine. BMC Medical Ethics 2015;16:69. doi:10.1186/s12910-015-0063-3.
20. DiCenso A, Cullum N, Ciliska D. Implementing evidence-based nursing: some misconceptions. Evid Based Nurs. 1998;1(2):38–9. doi:10.1136/ebn.1.2.38
21. Sackett DL, Straus SE, Richardson WS, Rosenberg W, Haynes RB. Evidence-based medicine: how to practice and teach EBM, 2nd edition. Edinburgh: Churchill Livingstone; 2000.
22. McCormack B, Kitson A, Harvey G, Rycroft-Malone J, Titchen A, Sers K. Getting evidence into practice: the meaning of "context". J Adv Nurs. 2002;38(1):94–104.
23. Rycroft-Malone J. Evidence-informed practice: from individual to context. J Nurs Manag. 2008;16(4):404–8. doi:10.1111/j.1365-2834.2008.00859.x.
24. Clarke S. Perceptions of organizational safety: implications for the development of safety culture. J Organ Behav. 1999;20(2)185–98. doi:10.1002/(SICI)1099-1379(199903)20:2<185::AID-JOB892>3.0.CO;2-C.
25. Muir Gray JA. Evidence-based healthcare: how to make health policy and management decisions. Edinburgh: Churchill Livingstone; 1997.

26. Muir Gray JA. Evidence-based healthcare and public health: how to make decisions about health services and public health, 3rd edition. Edinburgh: Churchill Livingstone; 2009.
27. Craig JV, Smyth RL. The evidence-based practice manual for nurses, 3rd edition. Edinburgh: Churchill Livingstone; 2012.
28. Melnyk BM, Fineout-Overholt E, Giggleman M, Cruz R. Correlates among cognitive beliefs, EBP implementation, organizational culture, cohesion and job satisfaction in evidence-based practice mentors from a community hospital system. Nurs Outlook 2010;58(6):301–8. doi:10.1016/j.outlook.2010.06.002.
29. LoBiondo-Wood G, Haber J. Nursing research: methods and critical appraisal for evidence-based practice, 8th edition. St Louis (MO): Elsevier Mosby; 2014.
30. Woodbury MG, Kuhnke JL. Evidence-based practice vs. evidence-informed practice: what's the difference? Wound Care (Canada) 2014;12(1):18–21.
31. Ciliska D, Thomas H, Buffett C. An introduction to evidence-informed public health and a compendium of critical appraisal tools for public health practice (revised). Hamilton (ON): National Collaborating Centre for Methods and Tools (NCCMT), School of Nursing, McMaster University; 2010 (http://www.nccmt.ca/uploads/media/media/0001/01/b331668f85bc6357f262944f0aca38c14c89c5a4.pdf, accessed 2 July 2017).
32. Lavis JN, Posada FB, Haines A, Osei E. Use of research to inform public policymaking. Lancet 2004;364(9445):1615–21.
33. Evidence-informed Policy Network (EVIPNet). In: WHO Regional Office for Europe [website]. Copenhagen: WHO Regional Office for Europe; 2017 (http://www.euro.who.int/en/data-and-evidence/evidence-informed-policy-making/evidence-informed-policy-network-evipnet, accessed 2 July 2017).
34. Sawatzky-Dickson D. Evidence-informed practice. Resource package. Winnipeg (MB): Winnipeg Regional Health Authority; 2010 (http://www.wrha.mb.ca/osd/files/EIPResourcePkg.pdf, accessed 2 July 2017).
35. Miles A, Loughlin M. Models in balance: evidence-based medicine vs. evidence-informed individualized care. J Eval Clin Pract. 2011;17:531–6.
36. Total health expenditure as % of GDP, WHO estimates 2014. In: European Health for All database [online database]. Copenhagen: WHO Regional Office for Europe; 2016 (https://gateway.euro.who.int/en/hfa-explorer/, accessed 2 July 2017).
37. Jha AK, Larizgoitia I, Audera-Lopez C, Prasopa-Plaizier N, Waters H, Bates DW. The global burden of unsafe medical care: analytic modelling of observational studies. BMJ Qual Saf. 2013;22(19):809–15.
38. Institute of Medicine Committee on Quality of Health Care in America. Crossing the quality chasm: a new health system for the 21st century. Washington (DC): National Academies Press; 2001 (http://www.nationalacademies.org/hmd/~/media/Files/Report%20Files/2001/Crossing-the-Quality-Chasm/Quality%20Chasm%202001%20%20report%20brief.pdf, accessed 2 July 2017).
39. Future directions for the national healthcare quality and disparities reports. Rockville (MD): Agency for Healthcare Research and Quality; 2014 (http://www.ahrq.gov/research/findings/final-reports/iomqrdrreport/index.html, accessed 2 July 2017).
40. Patient safety. In: World Health Organization [website]. Geneva: World Health Organization; 2017 (http://who.int/patientsafety/about/en/, accessed 2 July 2017).
41. Berwick DM. What "patient-centered" should mean: confessions of an extremist. Health Aff. 2009;28(4):w555–65. doi:10.1377/hlthaff.28.4.w555.
42. Burman ME, Robinson B, Hart AM. Linking evidence-based nursing practice and patient-centered care through patient preferences. Nurs Adm Q. 2013;37(3):231–41.
43. Carter SM, Rychetnik L, Lloyd B, Kerridge IH, Baur L, Bauman A et al. Evidence, ethics, and values: a framework for health promotion. Am J Public Health 2011;101(3):465–72. doi:http://dx.doi.org.pc124152.oulu.fi:8080/10.2105/AJPH.2010.195545.
44. Swift JK, Callahan JL. The impact of client treatment preferences on outcome: a meta-analysis. J Clin Psychol. 2009;65(4):368–81. doi: 10.1002/jclp.20553.
45. McGinty J, Anderson G. Predicators of physician compliance with American Heart Association guidelines for acute myocardial infarction. Crit Care Nurs Q. 2008;31(2):161–72. doi:10.1097/01.CNQ.0000314476.64377.12.
46. Considine J, McGillivray B. An evidence-based practice approach to improving nursing care of acute stroke in an Australian emergency department. J Clin Nurs. 2010;19(1/2):138–44. doi:10.1111/j.1365-2702.2009.02970.x.
47. Melnyk BM, Fineout-Overholt E, Gallagher-Ford L, Kaplan L. The state of evidence-based practice in US nurses: critical implications for nurse leaders and educators. J Nurs Adm. 2012;42(9):410–7. doi:10.1097/NNA.0b013e3182664e0a.
48. Hyrkas K, Rhudy JP. Promoting excellence – evidence-based practice at the bedside and beyond. J Nurs Manag. 2013;21(1):1–4. doi:10.1111/jonm.12051.
49. Melnyk BM, Gallagher-Ford L, Long LE, Fineout-Overholt E. 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. 2014;11(1):5–15. doi:http://dx.doi.org/10.1111/wvn.12021.

50. Padula WV, Mishra MK, Makic MBF, Wald HL, Campbell JD, Nair KV et al. Increased adoption of quality improvement interventions to implement evidence-based practices for pressure ulcer prevention in US academic medical centers. Worldviews Evid Based Nurs. 2015;12(6):328–36. doi:http://dx.doi.org/10.1111/wvn.12108.
51. Genrich I, O'Mara SK, Sulo S. Using a new evidence-based trauma protocol to improve detection and reduce costs in patients with blunt cardiac injury. J Trauma Nurs. 2015;22(1):28–34. doi:10.1097/JTN.0000000000000096.
52. Ho J K-M, Chau J P-C, Cheung N M-C. Effectiveness of emergency nurses' use of the Ottawa Ankle Rules to initiate radiographic tests on improving healthcare outcomes for patients with ankle injuries: a systematic review. Int J Nurs Stud. 2016;63:37–47. doi:http://dx.doi.org/10.1016/j.ijnurstu.2016.08.016.
53. Melnyk BM. Important information about clinical practice guidelines: key tools for improving quality of care and patient outcomes. Worldviews Evid Based Nurs. 2015;12(1):1–2. doi:http://dx.doi.org/10.1111/wvn.12079.
54. Global guidelines on the prevention of surgical site infection. Geneva: World Health Organization; 2016 (http://www.who.int/gpsc/ssi-prevention-guidelines/en/, accessed 2 July 2017).
55. Kim SC, Stichler JF, Ecoff L, Brown CE, Gallo A-M, Davidson JE. Predictors of evidence-based practice implementation, job satisfaction, and group adhesion among regional fellowship program participants. Worldviews Evid Based Nurs. 2016;13(5):340–8. doi:http://dx.doi.org/10.1111/wvn.12171.
56. Newhouse RP. Creating infrastructure supportive of evidence-based nursing practice: leadership strategies. Worldviews Evid Based Nurs. 2007;4(1):21–9. doi:10.1111/j.1741-6787.2007.00075.x.
57. Mitchell PH. Defining patient safety and quality care. In: Hughes RG, editor. Patient safety and quality: an evidence-based handbook for nurses. Rockville (MD): Agency for Healthcare Research and Quality; 2008:1–5 (https://archive.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/nurseshdbk.pdf, accessed 2 July 2017).
58. Titler MG. The evidence for evidence-based practice implementation. In: Hughes RG, editor. Patient safety and quality: an evidence-based handbook for nurses. Rockville (MD): Agency for Healthcare Research and Quality; 2008:1–20 (https://archive.ahrq.gov/professionals/clinicians-providers/resources/nursing/resources/nurseshdbk/nurseshdbk.pdf, accessed 2 July 2017).
59. Melnyk BM. Achieving a high-reliability organization through implementation of the ARCC model for systemwide sustainability of evidence-based practice. Nurs Adm Q. 2012;36(2):127–35.
60. Centers for Medicare and Medicaid Services. Medicare program: changes to the hospital inpatient prospective payment systems and fiscal year 2009 rates. Fed Registr. 2008;19(73):48433–9084.
61. Fitzsimons E, Cooper J. Embedding a culture of evidence-based practice. Nurs Manag. 2012;19(7):14–9.
62. Wallen GR, Mitchell SA, Melnyk B, Fineout-Overholt E, Miller-Davis C, Yates J et al. Implementing evidence-based practice: effectiveness of a structured multifaceted mentorship programme. J Adv Nurs. 2010;66(12):2761–71. doi:10.1111/j.1365-2648.2010. 05442.x.
63. The global nursing shortage: priority areas for intervention. A report from ICN/FNIF. Geneva: International Council of Nurses; 2006 (http://www.icn.ch/publications/the-global-shortage-of-registered-nurses-an-overview-of-issues-and-actions/, accessed 2 July 2017).
64. McKee M, Stuckler D, Basu S. Where there is no health research: what can be done to fill the global gaps in health research? PLoS Med. 2012;9(4):e1001209.
65. Nurses and midwives: a vital resource for health. European compendium of good practices in nursing and midwifery towards Health 2020 goals. Copenhagen: WHO Regional Office for Europe; 2015 (http://www.euro.who.int/en/health-topics/Health-systems/nursing-and-midwifery/publications/2015/nurses-and-midwives-a-vital-resource-for-health.-european-compendium-of-good-practices-in-nursing-and-midwifery-towards-health-2020-goals, accessed 2 July 2017).
66. Godshall M. Fast facts for evidence-based practice in nursing: implementing EBP in a nutshell, 2nd edition. New York (NY): Springer Publishing Company; 2016.
67. Polit D, Beck C. Nursing research: generating and assessing evidence for nursing practice, 9th edition. Philadelphia (PA): Lippincott Williams & Wilkins; 2012.
68. Undergraduate. In: School of Health and Life Sciences [website]. Glasgow: Glasgow Caledonian University; 2017 (http://www.gcu.ac.uk/hls/nursing/courses/undergraduate/, accessed 2 July 2017).
69. Advanced practice (MSc). In: Postgraduate [website]. Cardiff: Cardiff University; 2017 (http://www.cardiff.ac.uk/study/postgraduate/taught/courses/course/advanced-practice-msc2, accessed 2 July 2017).
70. Doctor of advanced healthcare practice. In: Postgraduate [website]. Cardiff: Cardiff University; 2017 (http://www.cardiff.ac.uk/study/postgraduate/research/programmes/programme/doctor-of-advanced-healthcare-practice, accessed 2 July 2017).
71. Oslo manual: guidelines for collecting and interpreting innovation data, 3rd edition. Paris: OECD Publishing; 2005 (http://dx.doi.org/10.1787/9789264013100-en, accessed 2 July 2017).
72. Varkey P, Horne A, Bennet KE. Innovation in health care: a primer. Am J Med Qual. 2008;23(5):382–8. doi:10.1177/1062860608317695.
73. Omachonu VK, Einspruch NG. Innovation in healthcare delivery systems: a conceptual framework. Innov J. 2010;15(1):article 2 (https://www.innovation.cc/scholarly-style/omachonu_healthcare_3innovate2.pdf, accessed 2 July 2017).

74. Global footprint. In: Joanna Briggs Collaboration [website]. Adelaide: The Joanna Briggs Institute; 2017 (http://joannabriggs.org/jbc.html, accessed 2 July 2017).
75. Wales Centre for Evidence Based Care – a Joanna Briggs Institute centre of excellence [website]. Cardiff: Cardiff University; undated (http://www.cardiff.ac.uk/research/explore/research-units/wales-centre-for-evidence-based-care, accessed 2 July 2017).
76. Estonian handbook for guidelines development. Geneva: World Health Organization; 2011 (http://apps.who.int/iris/handle/10665/44734, accessed 2 July 2017).
77. Holopainen A, Korhonen T, Miettinen M, Pelkonen M, Perälä M-L. Hoitotyön käytännöt yhtenäisiksi – toimintamalli näyttöön perustuvien käytäntöjen kehittämiseksi [Consistent nursing practices – a model for developing evidence-based practices]. Premissi 2010;1:38–45 (in Finnish).
78. Health and well-being by evidence based nursing. The national target and action plan 2004–2007. Helsinki: Ministry of Social Affairs and Health; 2003.
79. Increasing the effectiveness and attraction of nursing care by means of management. An action plan for the years 2009–2011. Helsinki: Ministry of Social Affairs and Health; 2009.
80. Perälä M-L, editor. The direction of nursing. A strategy for quality and effectiveness. Project group on nursing. Helsinki: National Research and Development Centre for Welfare and Health and Ministry of Social Affairs and Health; 1998.
81. Eriksson E, Korhonen T, Merasto M, Moisio E-L. Sairaanhoitajan ammatillinen osaaminen – sairaanhoitajakoulutuksen tulevaisuus-hanke [Nurse professional know-how – the future of nursing education project]. Helsinki: Polytechnic Health Network and Finnish Nursing Association; 2015 (https://sairaanhoitajat.fi/wp-content/uploads/2015/09/Sairaanhoitajan-ammatillinen-osaaminen.pdf, accessed 2 July 2017) (in Finnish).
82. ADAPTE Collaboration. The ADAPTE process: resource toolkit for guideline adaptation. Pitlochry: Guideline International Network; 2009 (http://www.g-i-n.net/document-store/working-groups-documents/adaptation/adapte-resource-toolkit-guideline-adaptation-2-0.pdf, accessed 2 July 2017).
83. Tervo-Heikkinen T, Äijö M, Holopainen A. A multidisciplinary and multiactor approach to falls prevention: the RFP Network. In: Aase K, Schibevaag L, editors. Researching patient safety and quality in healthcare: a Nordic perspective. Boca Raton (FL): CRC Press; 2016:131–44.
84. Heiwe S, Kajermo KN, Tyni-Lenne R, Guidetti S, Samuelsson M, Andersson I-L et al. Evidence-based practice: attitudes, knowledge and behavior among allied health care professionals. Int J Qual Health Care 2011;23(2):198–209.
85. Stavor DC, Zedreck-Gonzalez J, Hoffmann R. Improving the use of evidence-based practice and research utilization through the identification of barriers to implementation in a critical access hospital. J Nurs Adm. 2017;47(1):56–61. doi:10.1097/NNA.0000000000000437.
86. Alanen S, Kaila M, Välimäki M. Attitudes toward guidelines in Finnish primary care nursing: a questionnaire survey. Worldviews Evid Based Nurs. 2009;6(4):229–36.
87. Solomons NM, Spross JA. Evidence-based practice barriers and facilitators from a continuous quality improvement perspective: an integrative review. J Nurs Manag. 2011;19(1):109–120.
88. Dalheim A, Harthug S, Nilsen RM, Nortvedt MW. Factors influencing the development of evidence-based practice among nurses: a self-report survey. BMC Health Serv Res. 2012;12:367. doi:10.1186/1472-6963-12-367.
89. Brämberg EB, Nyman T, Kwak L, Alipour A, Bergström G, Schäfer Elinder L et al. Development of evidence-based practice in occupational health services in Sweden: a 3-year follow-up of attitudes, barriers and facilitators. Int Arch Occup Environ Health 2017;90(4):335–48. doi:10.1007/s00420-017-1200-8.
90. Stevens KR, McDuffie K, Clutter PC. Research and the mandate for evidence based practice, quality and safety. In: Mateo M, Kirchoff K, editors. Research for advance practice nurses: from evidence to practice. New York (NY): Springer Publishing Company; 2009:43–70.
91. Donald FD, Bryant-Lukosius R, Martin-Misener S, Kaasalainen K, Kilpatrick N, Carter P et al. Clinical nurse specialists and nurse practitioners: title confusion and lack of role clarity. Nurs Leadersh. (Tor Ont.) 2010;23:189–210.
92. Medves J, Godfrey C, Turner C, Paterson M, Harrison M, MacKenzie L et al. Systematic review of practice guideline dissemination and implementation strategies for healthcare teams and team-based practice. Int J Evid Based Healthc. 2010;8:79–89.
93. Expertise in evidence-based health care [website]. Helsinki: Nursing Research Foundation; 2017 (http://www.hotus.fi/hotus-en/expertise-evidence-based-health-care, accessed 2 July 2017).
94. Post registration career development framework [website]. Edinburgh: NHS Education for Scotland; 2017 (http://www.careerframework.nes.scot.nhs.uk/, accessed 2 July 2017).
95. Dans AL, Dans LF. The need and means for evidence-based medicine in developing countries. Evid Based Med. 2000;5:100–1.
96. Rehfuess EA, Durao S, Kyamanywa P, Meerpohl JJ, Young T, Rohwer A. An approach for setting evidence-based and stakeholder-informed research priorities in low- and middle-income countries. Bull World Health Organ. 2016;94(4):297–305. doi:http://dx.doi.org/10.2471/BLT.15.162966 (http://www.who.int/bulletin/volumes/94/4/15-162966-ab/en/, accessed 2 July 2017).

97. Smith JR, Donze A. Assessing environmental readiness: first steps in developing an evidence-based practice implementation culture. J Perinat Neonatal Nurs. 2010;24(1):61–71.
98. Dang D, White K. Creating a supportive evidence-based practice environment. In: Dearholt SL, Dang D, editors. John Hopkins nursing evidence-based practice: model and guidelines, 2nd edition. Indianapolis (IN): Sigma Theta Tau International; 2012:163–93.
99. Choo CW. Information management for the intelligent organization. The art of scanning the environment. Medford (NJ): Information Today Inc.; 2002.
100. Westrum R. A typology of organizational cultures. Qual Saf Health Care 2004;13:22–7. doi:10.1136/qshc.2003.009522.
101. Holopainen A, Junttila K, Jylhä V, Korhonen A, Seppänen S. Johda näyttö käyttöön hoitotyössä [Lead evidence into nursing practice]. Helsinki: Fioca Oy; 2013 (in Finnish).
102. Grol R. Beliefs and evidence in changing clinical practice. Brit Med J. 1997;5(315):418–21.
103. Grol R, Wensing M. What drives change? Barriers to and incentives for achieving evidence-based practice. Med J Aust. 2004;180:S57–60.
104. The JBI levels of evidence [website]. Adelaide: The Joanna Briggs Institute; 2016 (http://www.joannabriggs.org/jbi-approach.html#tabbed-nav=Levels-of-Evidence, accessed 2 July 2017).
105. Pathman DE, Konrad TR, Freed GL, Freeman VA, Koch GG. The awareness-to-adherence model of the steps to clinical guideline compliance: the case of pediatric vaccine recommendations. Med Care 1996;34(9):873–89.
106. Rogers EM. Diffusion of innovations, 5th edition. New York (NY): Free Press; 2003.
107. Pashaeypoor S, Ashktorab T, Rassouli M, Alavi-Majd H. Predicting the adoption of evidence-based practice using Rogers diffusion of innovation model. Contemp Nurse 2016;52(1):85–94. doi:http://dx.doi.org/10.1080/10376178.2016.1188019.
108. Dissemination and implementation research in health. PAR 10-038. Bethseda (MD): National Institutes of Health; 2013 (http://grants.nih.gov/grants/guide/pa-files/PAR-10-038.html, accessed 2 July 2017).
109. Mickan S, Burls A, Glasziou P. Patterns of "leakage" in the utilization of clinical guidelines: a systematic review. Postgrad Med J. 2011;87:670–9.

ANNEX 1.
INTERNATIONAL COLLABORATORS

International collaborators	Type of information	Website[a]
Agency for Healthcare Research and Quality (AHRQ)	Provides data resources, clinical guidelines and evidence summaries for health-care professionals	www.ahrq.gov
National Guideline Clearinghouse (NGC)	Public resources for summaries of evidence-based clinical-practice guidelines	https://www.guideline.gov/
Appraisal of Guidelines, Research and Evaluation (AGREE)	Development and evaluation of clinical guidelines	http://www.agreetrust.org/
Campbell Collaboration: the Campbell Library	Promotes positive social and economic change through the production and use of systematic reviews and other evidence synthesis for evidence-based policy and practice: systematic reviews	https://www.campbellcollaboration.org/
Centre for Reviews and Dissemination (CRD)	Produces policy-relevant research and innovative methods that advance the use of research evidence: systematic reviews, economic evaluations, summaries of health technology assessments, summaries of Cochrane and Campbell reviews	http://www.york.ac.uk/crd/
Cochrane Collaboration	Methodology for systematic reviews	http://www.cochrane.org/
Cochrane Library	Collection of six databases that contain different types of high-quality, independent evidence to inform health-care decision-making: systematic reviews	http://www.cochranelibrary.com/
GRADE working group (Grading of Recommendations Assessment, Development and Evaluation)	The GRADE working group has developed an approach to grading quality of evidence and strength of recommendations	http://www.gradeworkinggroup.org/

[a] Accessed 2 July 2017.

International collaborators	Type of information	Website
Guidelines International Network (G-I-N): the International Guideline Library	An international network that develops and promotes the implementation of clinical guidelines: clinical guidelines	www.g-i-n.net
Joanna Briggs Institute (JBI)	Methodology for systematic reviews	http://www.joannabriggs.org
JBI Database of Systematic Reviews and Implementation Reports (JBISRIR)	A refereed online journal that publishes systematic review protocols and systematic reviews of health-care research following the JBI methodology and undertaken by the JBI and its international collaborating centres and groups	http://journals.lww.com/jbisrir
Clinical Online Network of Evidence for Care and Therapeutics (COnNECT+)	Implementation tools	http://connect.jbiconnectplus.org/
Lippincott's Evidence-based Practice Network	Works in collaboration with JBI to spread health-care-related practice guidelines and research evidence from over 70 journals	http://www.nursingcenter.com/evidencebasedpracticenetwork/home.aspx
National Institute for Health and Clinical Excellence (NICE): National Health Service (NHS) evidence	Provides access to high-quality evidence and best practice through an extensive set of journals and bibliographic databases	https://www.nice.org.uk/
Registered Nurses' Association of Ontario (RNAO)	Clinical-practice guidelines	http://rnao.ca/bpg/guidelines
Scottish Intercollegiate Guidelines Network (SIGN)	Clinical-practice guidelines	http://www.sign.ac.uk/

The WHO Regional Office for Europe
The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

Member States
Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
Lithuania
Luxembourg
Malta
Monaco
Montenegro
Netherlands
Norway
Poland
Portugal
Republic of Moldova
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Tajikistan
The former Yugoslav Republic of Macedonia
Turkey
Turkmenistan
Ukraine
United Kingdom
Uzbekistan

World Health Organization
Regional Office for Europe
UN City, Marmorvej 51,
DK-2100 Copenhagen Ø, Denmark
Tel.: +45 33 70 00
Fax: +45 33 70 01
Email: euwhocontact@who.int
Website: www.euro.who.int