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## A Compelling Case for Evidence-Based Practice Mentor Development Programs: An Integrative Review

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**Improvements in Clinician, Organization, and Patient Outcomes Make a Compelling Case  
for Evidence-Based Practice Mentor Development Programs: An Integrative Review**

**A Compelling Case for Evidence-Based Practice Mentor Development Programs: An  
Integrative Review**

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**Background:** In 2008, The Institute of Medicine (IOM) set a goal that by 2020, 90% of healthcare decisions would originate from the best evidence available. This goal remains intangible for many organizations. Despite reporting quality and safety as a top organizational priority, a survey of 276 Chief Nurse Executives (CNEs) found that only roughly 50% of the CNEs said that EBP was practiced in their hospitals only “somewhat” or “not at all” (Melnik, Gallagher-Ford, Thomas, Troseth, Wyngarden, Kzalacha, 2016). Many organizations struggle to systematically integrate EBP into practice (Melnik et al., 2018; Warren et al., 2016a). The Advancing Research and Clinical Practice Through Close Collaboration (ARCC) Model presents a framework to promote the systematic integration of EBP using EBP mentors (Melnik, 2017).

**Aim:** To evaluate the research findings related to EBP mentor development programs, to identify effective practices, and to assess the outcomes associated with EBP mentor programs.

**Methods:** A comprehensive review of the literature was conducted to retrieve studies from CINAHL, PubMed, and Scopus, using keywords and subject headers related to EBP mentorship and quality and safety outcomes. Studies were appraised and reviewed to compare mentor program composition and examine clinician, organizational, and patient outcomes.

**Findings:** Fifteen studies met inclusion criteria: one randomized control trial (RCT), one literature review, eleven descriptive studies, and two case reviews. Most programs included didactic content, an EBP project with coaching, and resources to support learning. The studies found that these programs led to improvements in clinicians’ EBP beliefs, practices, and abilities, and the organization’s readiness for EBP, and improving patient safety.

**Implications to Practice:** There is solid justification for healthcare organizations to invest in an EBP mentor development program

*Keywords:* Evidence-Based Practice, EBP Mentor, EBP Champion, Nurses, EBP Fellowship, Implementation, Professional Development, Evidence Champion, Implementation Nurse, Mentorship

### **Background**

Evidence-based practice (EBP) is an approach to problem-solving that achieves optimal clinical outcomes by integrating the best evidence available (through a comprehensive search, appraisal, and synthesis of evidence), clinical expertise, and patient preference (Melnyk & Fineout-Overholt, 2019). The Institute of Medicine (2008) set a goal that 90% of healthcare decisions would be based on the best evidence possible by 2020, yet many challenges remain in achieving this goal. Common barriers include clinician's beliefs about the value of EBP, the ability to access and integrate evidence into practice, and systems issues, such as time, resources, and organizational value and preparedness (Melnyk et al., 2017). A national survey of 2,344 registered nurses (RNs) across the United States (U.S.) found significant gaps in self-reported competency in EBP and organizational preparedness (Melnyk et al., 2018). A different assessment of 6,800 RNs in the Mid-Atlantic region of the US found that less than half of the participants were confident in using EBP to change practice. Seventy-eight percent indicated that they had not accessed national practice guidelines nor literature reviews in the previous 8 weeks, and 69% had never generated a focused research question (Warren et al., 2016a). These findings indicate that nurses lack sufficient EBP competency and are not engaging in EBP activities frequently enough for organizations to achieve the IOM goal. Studies also reveal gaps in leadership and other key stakeholders' appreciation of the link between EBP and quality and patient safety. Melnyk et al. (2016) assessed leadership and organizational preparedness among 276 Chief Nurse Executives (CNEs) across 45 states and Washington DC. They found that

greater than 50% reported that EBP was practiced in their hospitals “somewhat” or “not at all,” and 72% reported that they had adequate financial resources allocated to EBP “somewhat” or “not at all.” While each of the CNEs listed quality and safety among the top three priorities for their organizations, only 3% listed EBP as a top priority. The disconnect between the discourse of patient safety and quality and EBP and the subsequent impact on how resources are allocated is staggering. EBP should be fundamental to the quality and patient safety endeavors, yet there appears to be a persistent disparity between the Institute of Medicine's (IOM) goal for EBP and the experiences of clinical nurses and nurse leaders. To bridge this gap, strategies are needed to address the individual and organizational barriers to implementation.

The ARCC Model is a conceptual framework that integrates Control theory (CT) and Cognitive behavior theory (CBT) to explain the facilitators and barriers to the widespread implementation of EBP (Melnyk & Fineout-Overholt, 2019). Control Theory explains how negative feedback loops drive behavior (Carver & Scheier, 1982). Melnyk and Fineout-Overholt (2019) used CT to explain the perceived disconnect between the current state of EBP and an organization’s goal motivates stakeholders to strive for the achievement of the ideal state. Organizations face intrinsic and extrinsic barriers that must be addressed to combat the negative feedback loop. EBP mentors help identify and address barriers and diminish resistance. The second theory integrated into the ARCC model is CBT, which was developed by Aron Beck in 1979 (Beck et al., 1979, as cited by Melnyk et al., 2019). According to CBT, behaviors are largely influenced by thoughts and feelings. The ARCC Model supposes that interventions that increase the implementation of EBP include supporting attitude and self-efficacy related to EBP activities. (Melnyk & Fineout-Overholt, 2019). The EBP mentor can make the connection

between EBP and quality and patient safety for leaders and staff, thereby strengthening the perceived value of EBP within the organization.

## **Methods**

### **PICO Question**

EBP mentors are at the center of the model because they lead the implementation of EBP, address barriers and facilitators, and role model integration of EBP into practice; however, there are pervasive gaps in EBP competency among nurses. Training and role development of nurses to become EBP mentors is a significant investment in time and resources. To evaluate the research findings related to EBP mentor development programs, to identify effective practices, and to assess the outcomes associated with EBP mentor programs, a literature search was conducted using the following PICO question: among registered nurses (P), how does implementation of an EBP mentor program (I) compared to no formal EBP program (C) affect clinician, organizational, and patient outcomes (O). Relevant keywords and subject headings were used to search in PubMed, Cumulative Index to Nursing, Allied Health Literature (CINHAL), and Scopus.

### **Inclusion and Exclusion Criteria**

The inclusion criteria for the search included (a) year of publication 2010 or newer, (b) sample includes registered nurses, (c) English language, and (d) studies with a sample greater than 20. Exclusion criteria included (a) publication older than 2010, (b) non-English language, (c) sample consists of prelicensure-nursing students (d) interventions discussed that did not include use of an EBP mentor. The initial search identified 37 articles. Citations and abstracts were screened using inclusion and exclusion criteria. Fifteen articles were selected for inclusion and appraised using the John Hopkins Nursing Evidence-Based Practice Research Appraisal

Tools (Dang & Dearholt, 2018). One article was appraised at Level I-Grade B, meaning it was a randomized control trial (RCT), and the quality was rated as good due to an adequate sample, consistent results, and some form of control.

Five studies were Level II-Grade A. Four were single quasi-experimental studies, and one was a systematic review of RCTs and quasi-experimental studies, each of them was graded high quality because they had consistent findings with adequate sample and control to allow for generalizable findings. There were six Level II-Grade B meaning they were quasi-experimental and of good quality. One Level II study was graded as Grade C due to a very low response rate and the fact that only one of two outcome measures included baseline data prior to the intervention. Two of the studies were organizational case reports appraised, and Level V. One was Grade A, and one Level V--Grade B. Both Level V studies demonstrated clear objectives, formal quality improvement, and strong methodology.

The Grade A study was across multiple settings, and the Grade B study was only in one unit. Fourteen of the studies were quantitative, and one study used a mixed-methods design. The studies included community health agencies, single and multi-site healthcare systems, and academic medical centers from the United States, Canada, and Singapore. Articles were assessed to compare interventions and examine clinician, organizational, and patient outcomes.

## **Findings**

### **Interventions**

A review of the literature revealed a high level of variation in the length and composition of EBP mentor training programs. Interventions varied in length from fewer than three months to one year, with the majority lasting six months to one year (Abdula et al., 2014; Breckenridge-Sproat, Throop, Raju, Murphy, Loan, & Patrician,., 2015; Chan, Glass, & Phang, 2020; Cullen et

al., 2020; Kim et al., 2017; Melnyk, Fineout-Overholt, Giggelman, & Choy et al., 2017; Royer, Crary, Fayram, & Heidrich, 2018). The most prevalent interventions included didactic content, an EBP project with individual or group coaching sessions, and an EBP toolkit or printed resources to supplement training.

Most programs utilized traditional classroom-style teaching; however, two studies used a flipped classroom model to deepen synchronous learning (Kim et al., 2017; Spiva et al., 2017), and two programs used blended learning consisting of in-person and web-based training (Cullen et al., 2020; Spiva et al., 2017). The majority of fellowships included completion of an EBP project with group coaching by an experienced EBP mentor (Abdula et al., 2014; Cullen et al., 2020; Friesen et al., 2017; Melnyk et al., 2017; Morgan, 2012; Spiva et al., 2017; Royer et al., 2018; Warren, Montgomery, & Friedman, 2016), while two utilized individual coaching throughout the program (Chan et al., 2020; Levin et al., 2011).

Six programs distributed a toolkit or printed materials to reinforce learning (Breckenridge-Sproat et al., 2015; Friesen et al., 2017; Levin et al., 2011; Lott et al., 2020; Melnyk et al., 2017; Morgan, 2012) and five programs gave trainees access to an electronic repository of resources (Breckenridge-Sproat et al., 2015; Friesen et al., 2017; Lott et al., 2020; Spiva et al., 2017, Warren et al., 2016). There is variation in the length and composition of the EBP mentor programs. Each of the studies showed some level of improved outcomes despite the variation. It can be concluded that a multifaceted approach to EBP mentor development leads to improved outcomes.

### **Outcomes**

Outcome variables identified in the review were categorized as clinician outcomes, organizational outcomes, and patient outcomes. Clinician outcomes were defined as those that

directly impacted the attitudes, values, practice, or competence of the healthcare worker. The outcome that impacted the organizations' culture, operations or finance was defined as organizational outcomes. Patient outcomes were defined as clinical outcomes that reflect the quality and safety of patient care.

### **Clinician Outcomes**

The most consistent finding in the literature was that EBP mentor programs improved clinician outcomes. Multiple studies showed that EBP mentor programs strengthened EBP beliefs, implementation, and ability. Four studies used the EBP Beliefs (EBPB) scale to measure the extent to which clinicians valued EBP, and the EBP Implementation (EBPI) scale to measure changes in the frequency of implementation of EBP in practice. The EBPB scale is a 16-item Likert scale that measures clinician's beliefs about EBP and the importance of EBP to clinical practice. The EBPI scale is an 18-item Likert scale that measures nurses' self-report of participation in EBP activities in the preceding eight weeks. Both scales have demonstrated validity through consistency with similar variables and reliability (Cronbach's  $\alpha = .90$ ) (Melnyk et al., 2008).

Kim et al. (2017) analyzed pre- and post-test scores for three cohorts of participants in regional collaborative EBP mentor fellowships and found statistically significant increases in EBPB and EBPI ( $p < .05$ ). They also reported an increase in job satisfaction and demonstrated a positive correlation between EBPB and job satisfaction ( $p = .002$ ). Breckenridge-Sproat et al. (2015) implemented a multifaceted EBP program across three military hospitals. The program's foundation was a team of unit-based EBP mentors who went through an EBP workshop and follow-up coaching sessions. The study team found a significant increase in the EBPB scores for

the mentors and a measurable but statistically insignificant increase in the EBPB scores of clinical nurses. They also found a statistically insignificant increase in EBPI for both groups.

Friesen et al. (2017) conducted a mixed-methods study to evaluate the effectiveness of an EBP mentoring pilot program at a multi-site healthcare system. Five hospitals, each designated one pilot unit, with each containing one team leader and one clinical nurse trained as an EBP mentor for the department. The team conducted pre- and post-tests for the EBPI and EBPB scales and recruited 24 nurses for focus groups to gather qualitative data. They found a significant increase in EBPI. They also discovered a small but not statistically significant increase in EBPB and nurses in the focus groups reported feeling happy to participate and that the program enhanced their engagement in EBP. While the increase in EBPB was not statistically significant, the improved mood and participation demonstrate the program's value.

Levin et al. (2011) randomized two groups of nurses from a large not-for-profit agency in New York. The experimental group participated in an EBP mentor program with a corresponding EBP project; the control group received an equal number of education hours on a clinical topic with no EBP training. The nurses in the experimental group had higher EBPB ( $p < .001$ ) and EBPI following the intervention ( $p = .006$ ), as compared to the control group. These findings indicate that a comprehensive EBP mentor program effectively improves EBPB and EBPI versus education alone. Melnyk et al. (2017) implemented an interprofessional EBP mentorship program over a 12-month period. Post-test scores showed an increase in the mean EBPB ( $p = .001$ ) compared to the pre-test scores, and the mean EBPI scores improved ( $p = .001$ ) after 12 months. While the types of settings and specialties of nurses varied in the studies described above, the findings remained consistent. All the EBP mentor development programs using the EBPB and EBPI scoring methodology led to improvements in EBP beliefs and implementation. .

Another tool that measures clinicians' attitudes, knowledge, and practice related to EBP is the Evidence-Based Practice Questionnaire (EBPQ). The EBPQ is a 24-item Likert scale survey with three subscales that measure knowledge, skill, attitude, and practice. Each subscale has a demonstrated Cronbach's score of  $>.70$  (Upton & Upton 2016, as cited by Chan et al., 2019).

Four of the studies reviewed used this scale, alone or in conjunction with other tools, to assess the benefits of EBP mentor programs on clinician outcomes. Chan et al. (2020) implemented nursing research and EBP mentorship in Singapore, with nine nurses recruited to participate in an EBP mentor fellowship using the ARCC model as a framework. They collected baseline and post-intervention surveys from the mentors and nurses working on the same units as the mentors using the EBPQ scales. Both mentors and their colleagues had increased scores for all three subscales, and the mentors had greater increases for each scale than the clinical nurses did. For both the mentors and the clinicians, the practice subscale had the greatest improvement. The authors demonstrated that investing in a small team of mentors can improve nurses' beliefs, knowledge, and practices regarding EBP in their departments.

Carter et al. (2018) implemented four infrastructure-related interventions to promote EBP in a large, six-hospital system in New York. One of these interventions included an EBP mentor program where the EBP mentors subsequently implemented additional interventions. Post-intervention surveys for 605 nurses found scores above the mid-point for each subscale. While no baseline data could provide a comparison, the authors found a significant increase in library utilization for RNs, a leading indicator for EBP practice. This increase in library utilization implies that nurses were asking more clinical questions and seeking evidence to answer these questions more often due to the interventions. The authors conclude that the

EBPQ scores above mid-point, combined with the increase in library utilization, support an increase in EBP implementation and value.

Spiva et al. (2017) conducted an EBP mentor training program where mentors spent a year implementing strategies to promote EBP in the organization. They were given the EBPQ survey pre/post-training, along with the EBP Confidence Scale, which uses a five-item spectrum to measure perceptions of knowledge and ability to implement EBP. It has a demonstrated context validity index of .90 and Cronbach's  $\alpha = .96$  (Spiva 2012, as cited by Spiva et al., 2017). Mentors were given each scale pre/post-training, and post-test scores for each scale were higher than pre-test scores. Following the year of interventions, clinical nurses were given a series of surveys that demonstrated similar findings. The EBP mentor program not only directly improved the attitudes, knowledge, and ability of the mentors immediately following the program, it also led to similar long-term gains among the nurses working alongside the peers.

Lott et al. (2020) evaluated the effectiveness of integrating EBP into existing professional governance infrastructure to promote EBP in a cost-neutral manner. This project included an EBP mentor development program, resources to support EBP, and existing structures to create opportunities for EBP mentorship and application. To measure mentors' impact, the authors used the Evidence-Based Nursing Practice Self-Efficacy Scale, which measures self-confidence to implement EBP. They used the EBPQ scale to measure the impact on clinical nurses. The mentors' self-efficacy was measured at baseline, immediately after the EBP training, and three months following the training. Scores increased over time, and the standard deviation decreased, indicating that mentors increased in confidence while their scores decreased in variation over time. Following project implementation, the clinical nurses

completed the EBPQ, and results were compared with a baseline survey conducted two years prior. The EBP practice domain showed the greatest impact, with significant increases for all items in the subscale. The other subscales showed small increases that did not meet the threshold of statistical significance. There is strong, compelling evidence that implementation of an EBP Mentor program improves nurses' knowledge, beliefs, and extent of EBP implementation.

### **Organizational Outcomes**

Seven studies reported improvements in organizational outcomes. According to the ARCC model, organizational readiness and culture can either be a facilitator or a barrier to EBP implementation. Four of the studies evaluated impact to organizational readiness to implement EBP. Three studies evaluated clinicians' perceptions of organizational preparedness and the organization's support of EBP. All three studies showed improvements in preparedness and support for EBP following the intervention (Melnyk et al., 2017; Spiva et al., 2017; Warren et al., 2016b). One study measured nurses' perceived barriers after piloting an EBP mentor program and found significant decreases in their perceptions of organizational barriers to EBP (Morgan, 2012). Each of these EBP mentor development programs increased the organizations' capacity for EBP implementation either by improving culture or addressing organizational barriers.

There were also improvements in staff engagement and professional development. Cullen et al. (2020) found that clinical nurses who participated in their EBP change champion programs reported motivation to improve outcomes in their practice areas. The authors also indicated that many participants in the program subsequently joined one or more shared governance committees. Another study described a 300% increase in EBP or performance improvement projects led or co-led by clinical nurses (Lott et al., 2020). A five-year longitudinal study

measured participants engagement in EBP, organizational leadership, and professional development. One year after program completion 70% of participants were mentoring others in EBP, performance improvement (PI), or research and 65% had started a new EBP, PI, or research project. More than two-thirds of participants had been asked to participate in a nursing shared governance council or interdisciplinary committee, 65% began or completed a graduate education program, and 49% experienced an advancement in career position (Royer et al., 2018). In their three-year long evaluation of multiple EBP mentor cohorts, Warren et al, (2016) discussed and increase in the number of EBP and research projects initiated by staff and reported that both new and experienced RNs presented and published their projects. Participation in EBP mentor development programs led to gains not only in EBP engagement, but also in clinical nurse engagement in practice councils, interdisciplinary committees, career advancement, and pursuit of graduate degrees.

Organizations also experienced financial benefits as a result of the EBP mentor development programs. These gains were experienced either through savings related to improved patient outcomes or decreased RN turnover. One case report which described the EBP mentor role in reducing CAUTI rates estimated a total cost savings of \$109,368 (Cullen et al., 2020). Levin et al, (2011) reported a reduction in turnover from 50% to 11% in the experimental group. According to a recent study of RN turnover in the US, the average cost of turnover ranges from \$33,300-\$56,000. (NSI Nursing Solutions, 2020). While there are only two studies that reported financial outcomes, the results are very compelling. There is solid evidence that EBP mentor programs provide significant cultural and financial benefits to healthcare organizations.

## Patient Outcomes

Five of the studies reported improvements in patient outcomes related to quality and safety. As part of an evaluation of a large EBP mentor development program, Melnyk et al. (2017) reported the outcome measures for improvements in projects led by the mentors. Five nurse-sensitive outcomes showed significant improvement regarding ventilator days; hospital-acquired pressure injuries (HAPI), ambulation rates, readmission rates, and exclusive breastfeeding rates.

In their systematic review, Abdulla et al. (2014) found mixed reviews related to patient outcomes, noting that many of the EBP projects evaluated clinician process measures, such as care bundle compliance, rather than patient outcomes. One case report discussed how a mentor-lead EBP practice improvement project decreased CAUTIs in a long-term acute care hospital. The mentor's role was to guide the unit-based EBP team in the EBP process and change management strategies. The project yielded a 26.1% decrease in catheter days (medium effect size = .65,  $p < .001$ ) and a 33% reduction in CAUTI rates (small effect size,  $p = .49$ ) (Magers, 2014).

A similar study by Cullen et al. (2020) found that using an EBP mentor reduced CAUTI rates from 0.78 to 0.00 infections per 1,000 catheter days. A satisfaction survey showed that project participants were satisfied, engaged, and motivated to implement change. Finally, Morgan (2012) used HAPI improvement as a pilot to determine whether EBP mentors improve nurse sensitive quality indicators. The intervention was rolled out in three phases. During phase one, the mentors led sessions on the EBP process basics, conducted a literature review, and made practice recommendations. In phase two, the team learned to evaluate the initiative's effectiveness, and phase three focused on sustainability. The organization reported a 5% decrease

in HAPI from one quarter to the next following this project. There is significant evidence that EBP mentor programs lead to improved patient outcomes.

### **Strengths and Limitations**

Bias was controlled during the literature search, appraisal, summary, and synthesis of findings using non-directional search terms and evidence-based tools. The majority of studies included were graded as high or good quality, indicating robust methodology and sound evidence. This literature review identified consistent findings across a diverse body of evidence. The settings varied in both types of healthcare organizations and geographic locations.

One limitation of the articles in this review is the potential for publication bias. Some of the studies sample size was too small to achieve statistical significance, and others included insufficient gains or negative findings. However, it is not possible to determine how many EBP programs with negative outcomes were not published.

Another limitation was using tools that rely on participant self-reports rather than objective measurement to evaluate clinician outcomes. It has been well documented that learner's self-assessment poses only a moderate correlation with either instructor evaluation or the results of objective measurement tools (Dunning, Heath, & Suls, 2018). The tools used to measure clinician outcomes were reported to be valid and reliable, and the findings showed a high level of consistency. There is a need for studies that control for bias related to self-reports by either including instructor or mentor evaluation of learners or through tools that do not rely on self-reporting.

### **Implications to Practice**

This literature review demonstrates strong evidence that multifaceted EBP Mentor development programs lead to improved outcomes for nurses, organizations, and their patients.

While there are many different types of successful EBP mentor development programs, the most common program elements include formal training on the EBP process, an EBP implementation project to reinforce training and build skills, group or individual coaching sessions throughout the EBP project, and availability of resources for mentors to refer back to during and after the program.

EBP Mentor program benefits to nurses include strengthened beliefs about EBP, improved knowledge, skill, and competence; increased implementation of EBP into their practice; and increased job satisfaction. Clinicians' beliefs, competency, and implementation of EBP are keys to system-wide integration of EBP, which, in turn, leads to increased quality, safety, and decreased costs (Melnyk et al., 2017). An EBP mentor program's organizational benefits include increased staff engagement, organizational readiness for EBP, and cost avoidance associated with a reduction in hospital acquired conditions and decreased RN turnover. Patients benefit from improved quality and safety when nurses and other health care professionals implement effective care based on the best evidence available. There is a solid justification for healthcare organizations to invest in an EBP Mentor development program.

**Linking Evidence to Action**

- EBP Mentors are foundational to organizational implementation of EBP.
- Development of EBP mentors requires a multifaceted approach.
- EBP mentor development programs lead to improved outcomes for nurses, organizations, and patients.
- Healthcare organizations which invest in an EBP mentor program are likely to see gains in quality, patient safety, affordability, and joy and meaning among clinicians.

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systems. *Worldviews on Evidence-Based Nursing*, 13(1), 15-24. doi:10.1111/wvn.12149

Warren, J. I., Montgomery, K. L., & Friedmann, E. (2016). Three-year pre-post analysis of EBP

integration in a magnet-designated community hospital. *Worldviews on Evidence-Based*

*Nursing*, 13(1), 50-58. doi:10.1111/wvn.12148

**Appendix A**

**Table of Evidence for Review and Online Submission Only**

Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility /Conclusion(s) / Recommendation(s) /
1. Abdullah, G., Rossy, D., Ploeg, J., Davies, B., Higuchi, K., Sikora, L., & Stacey, D. (2014). Measuring the Effectiveness of Mentoring as a Knowledge Translation Intervention for Implementing Empirical Evidence: A Systematic Review. Wiley-Blackwell. <a href="https://doi.org/10.1111/wvn.12060">https://doi.org/10.1111/wvn.12060</a>								
To explore the impact of mentorship as an intervention to improve EBP	None	Cochrane's Effective Practice and Organization of Care, PRISMA	10 articles from USA, Canada, Australia	Independent variables: Use of Mentor Vs No mentor & single-intervntn control/ or multi-intervntn control  Dependent: Knowledge Translation, related to EBP, guidelines, use of instruments  Patient Outcomes: definition specific to each study  Practitioner outcomes: Group cohesion,  Organizational Outcomes: Retention, LOS,	Descriptive statistics narrated	Summary of findings compared for each variable identified	One study compared a multi-thronged approach w/ vs without mentors and showed no statistical difference, 9 studies showed single intervention (education or audits w/ feedback) vs multi-thronged approach w/ mentors. A few studies showed improved adherence to guidelines, mixed results with knowledge and adherence to clinical recommendations, studies that evaluated value & beliefs related to EBP showed improvement w/ presence of mentor.	II, A  Worth: While use of mentor showed mixed results of patient outcomes they consistently show improved value, beliefs, and knowledge specific to EBP.  Strengths: Robust methodology for review, identified themes in outcomes and methodology related to mentorship  Weakness: Individual studies had great variability in study design, methodology, and measurement tools used.  Conclusions: Use of a mentor is likely to improve EBP beliefs, EBP competence, and may improve patient outcomes.  Recommendations: Use of consistent tools, further evaluation of patient outcomes w/ implementation of EBP mentors

Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
2. Breckenridge-Sproat, S., Throop, M. D., Raju, D., Murphy, D. A., Loan, L. A., & Patrician, P. A. (2015). Building a Unit-Level Mentored Program to Sustain a Culture of Inquiry for Evidence-Based Practice. <i>Clinical Nurse Specialist: The Journal for Advanced Nursing Practice</i> , 29(6), 329-337. <a href="https://doi.org/10.1097/NUR.000000000000161">https://doi.org/10.1097/NUR.000000000000161</a>								
To evaluate the effectiveness of an unit-level EBP mentor program at a multicite HCS	ARCC Model	Pre/post test	3 military hospitals that underwent significant restructuring in the middle of the interven	Organizational Readiness/EBP Culture  EBP Beliefs  EBP Implementation	OSRIEP, EBPB and EBPI scales	Dependent t-test for matched pairs of data, independnt t-test for unmatche d pre/post test results	There was improvement in all 3 scales, the results were only significant for the matched pair data on ORSIEP (p=.05) and EBPB P=.02	II, A  Demonstrates that an EBP mentor program improves organizational readiness and EBPB  Limitations: org restructure made it such that we cannot determine how many of the respondents of the post-test also participated in the pre-test, very low-volume of matched pairs for the results analysis because of org changes and incomplete or missing ID codes on paper surveys
Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
3. Carter, E. J., Rivera, R. R., Gallagher, K. A., & Cato, K. D. (2018). Targeted Interventions to Advance a Culture of Inquiry at a Large, Multicampus Hospital Among Nurses. <i>Journal of Nursing Administration</i> , 48(1), 18-24. <a href="https://doi.org/10.1097/NNA.0000000000000565">https://doi.org/10.1097/NNA.0000000000000565</a>								
To assess the impact of implementation of 4 structure related	Not identified	Descriptive Study	Large multi-cite HCO with 6 hospitals in NY	RN utilization of library resources  Self-reported EBP attitudes, knowledge, and practices	Library use tracked overtime using existing data collection tool for library	Library service over time using ANOVA	Library utilization increased significantly p=.0025  On a scale of 1-7 Knowledge 5.06, Attitudes 5.89, Practice 4.87	II, C RN access to library is an objective measure of RN participation in EBP that does not rely on self-reporting, it does not tell whether evidence was appraised or used but in promoting a culture of inquiry it does show questions are being asked and evidence

<p>interventions to promote EBP</p>			<p>Sample: clinical nurses, educators and nurse leaders n=6000</p>		<p>requests EBP attitudes, knowledge, practices measured using EBP Questionnaire Cronbach's a 0.87, internal consistencies 0.79-0,91</p>	<p>EBP Questionnaire descriptive statistics</p>		<p>sought out. Limitations- very low response rate (13%), no baseline data for survey so cannot say to what extent the interventions are responsible for the scores</p>
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Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
4. Chan, E., Glass, G. F., & Phang, K. N. (2020). Evaluation of a Hospital-Based Nursing Research and Evidence-Based Practice Mentorship Program on Improving Nurses' Knowledge, Attitudes, and Evidence-Based Practice. <i>Journal of Continuing Education in Nursing</i> , 51(1), 46-52. <a href="https://doi.org/10.3928/00220124-20191217-09">https://doi.org/10.3928/00220124-20191217-09</a>								
To evaluate the effectiveness of an EBP mentorship program on the mentees and their nursing colleagues	ARCC	Descriptive pre/post test	Large tert. hosp in Singapore  Sample: 9 Junior RN mentees plus their nursing colleagues n=210 per-surveys n=214 post-surveys, nurses on night shift excluded	Knowledge, attitudes, and practice of EBP	EBPQ survey with 3 subscales measuring knowledge, attitudes, and practice of EBP Cronbach a for each subscale is >0.7	Descriptive statistics using means and %  Wilcox rank sum test	There was improvement for all 3 subscales for both the mentees and their colleagues, the mentees have greater increase and had an increase in every line item on the scale. EBP Practice was the largest gain for both groups p<.001	II, A  Demonstrates effectiveness of a multifaceted approach to the development of EBP mentors, demonstrates diffusion of knowledge from mentees to nursing units  Limits: small sample of mentees, data collected as aggregate not individual, night shift nurses excluded, not yet able to assess impact on patient outcomes

Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
5. Cullen, L., Hanrahan, K., Farrington, M., Anderson, R., Dimmer, E., Miner, R., Suchan, T., & Rod, E. (2020). Evidence-Based Practice Change Champion Program Improves Quality Care. <i>JONA: The Journal of Nursing Administration</i> , 50(3), 128-134. <a href="https://doi.org/10.1097/NNA.0000000000000856">https://doi.org/10.1097/NNA.0000000000000856</a>								
Describe one organization's experience	IOWA Model for EBP	Organizational Experience	Large academic hospital in	NA knowledge, CAUTI rates, relative cost savings,	NA pre/post test	Pre and post data are	NA knowledge improved, CAUTI rates dropped and sustained, (from 0.78/1k CD to 0.00/1k CD) participants were satisfied,	V, B  Emphasis on Change Management and

<p>developing EBP Change Champions program</p>			<p>the Midwest</p>	<p>participant satisfaction</p>	<p>CAUTI rates infection per 1k CDs  Satisfaction via survey w/ Likert and open ended questions</p>	<p>compared by count or percentage</p>	<p>motivated to continue to champion change, more engaged  Estimated savings of \$109,368</p>	<p>important part of the EBP Mentor role  Limitation small sample, statistical analysis not clearly described.</p>
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Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
6. Friesen, M. A., Brady, J. M., Milligan, R., & Christensen, P. (2017). Findings from a Pilot Study: Bringing Evidence-Based Practice to the Bedside. <i>Worldviews on Evidence-Based Nursing</i> , 14(1), 22-34. <a href="https://doi.org/10.1111/wvn.12195">https://doi.org/10.1111/wvn.12195</a>								
To evaluate effectiveness of a EBP mentor based education program	ARCC John Hopkins Nursing Evidence-Based Practice Model, Roger's Diffusion of Innovation	Mixed methods Interventions: Classroom teaching, weekly bulletins, group coaching calls for appraisal, group meeting in-person for synthesis, application project,	5 nursing units, one from each of the 5 hospitals in a multi-site system	EBP Beliefs EBP Implementation	EBP Beliefs Scales EBPI Scale	Comparison of group means via t-test	EBPB had a slight increase but not statistically significant ( $p > .1$ ) EBPI had a statistically significant increase ( $t=1.75$ , $df=56$ , $p < .05$ )	II, B Worth to practice: supports existing evidence that an EBP mentorship improves nurses' participation in EBP activities. While EBPB increase not statistically significant, the perintervention mean was 64.54 which is on the higher end of the scale. The nurses were chosen based on being innovator and early adopters within their units which introduces bias towards a sample with high beliefs to begin with. Limitation: low response rate on post-intervention
7. Kim, S. C., Ecoff, L., Brown, C. E., Gallo, A. - M., Stichler, J. F., & Davidson, J. E. (2017). Benefits of a Regional Evidence-Based Practice Fellowship Program: A Test of the ARCC Model. <i>Worldviews on Evidence-Based Nursing</i> , 14(2), 90-98. <a href="https://doi.org/10.1111/wvn.12199">https://doi.org/10.1111/wvn.12199</a>								
Determine whether a regi, collaborative EBP fellowship prog improves participants' EBP beliefs,	ARCC Model	Pre-test/post-test	Attendees for 3 annual cohorts in a 9 month EBP fellowship	EBP beliefs- the extent to which nurse value EBP, EBP	EBP Beliefs Scale: 16-item tool w/ Likert scale responses)	Descriptive statistics to summarize study variable	Significant improvement for EBP beliefs $p < .001$ , EBP implementation $p < .001$ , job satisfaction $p = .047$ , and group cohesion $p = .014$ , not a significant difference for group attractiveness $p = .889$	A, II Supports implementation of EBP fellowship w/ mentorship vs standalone education re EBP. Provides further evaluation of ARCC model for EBP. This study uses 4 valid and reliable measurement tools which could be

<p>EBP implementation, job satisfaction, group cohesion, and group attractiveness</p> <p>Examine the relationship among the improvements using structural equation modeling</p>			<p>from multiple hospitals in San Diego, CA</p> <p>120/175 participants completed pre and post-test (69% completion rate)</p>	<p>implementation- extent to which nurses are participating in EBP-related activities ,</p> <p>Job satisfaction, Group cohesion- the productivity, efficiency, feelings of belonging, and morale of the group</p> <p>Group attractiveness- the extent to which participants enjoyed working with the group.</p>	<p>EBP Implementation Scale 18-item tool w/ Likert scale responses</p> <p>Job Satisfaction Scale</p> <p>Group Cohesion Scale</p> <p>Group Attractiveness Scale</p>	<p>Paired t-test to compare pre &amp; post score for each scale, improvements measures as (post test- pre-test score)</p>		<p>applied to DNP project</p> <p>According to lit review increased EBP implementation and beliefs leads to improved patient and nurse outcomes, this article is focused specifically on nurse outcomes.</p> <p>The fellowship in this article is too long to be feasible for DNP project (9 months), however the model could be applied on a shorter timeline.</p>
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Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
<p>To determine the preliminary effects of implementing the Advancing Research and Clinical practice through close</p>	<p>ARCC: EBP mentor assists clinicians in developing EBP competency and implementing EBP projects</p>	<p>2 group RCT Control group: didactic content of physical assessment comparable in length to EBP session in ARCC group</p>	<p>Members of Visiting Nurse Service in NY</p> <p>Criteria: &gt;21, read &amp; speak English, FT or PT employee</p>	<p>(a) nurses' beliefs about EBP; (b) nurses' implementation of EBP; (c) nurses' perceptions of group cohesion; (d) nurses' job</p>	<p>All scales Cronbach&gt;0.8 Beliefs about EBP- measure using 16 item EBP belief scale EBP Implementation -EBP</p>	<p>Descriptive statistics, x<sup>2</sup> t tests, analysis of variance w repeated measures all measured at baseline,</p>	<p>Intervention group had greater increase of EBPB &amp; EBPI scores at intervals 3&amp;4 vs control (p&lt;.001 for EBPB and p .006 for EBPI)</p> <p>No significant difference between experimental &amp; control groups for Group cohesion, work satisfaction, or productivity. One year after the pilot study the experimental group had reduction in turnover</p>	<p>I, B</p> <p>Worth to practice: one of the only RCTs related to EBP Implementation, Indicated ARCC model effective for improving nurse's beliefs about EBP and implementation.</p> <p>Strengths: solid design w/ strategy in place to control for bias, demographics of experimental and control well matched,</p> <p>Weakness: Methodology for randomizing into</p>

<p>collaboration  (ARCC) model on nurses' EBP beliefs, EBP implementation behaviors, group cohesion, productivity, job satisfaction, and attrition/turnover rates</p>	<p>-AND-  Implements strategies to overcome barriers to a culture of EBP  ARCC driven by Control Theory &amp; Cognitive behavioral theory</p>	<p>Experimental Group: didactic content on EBP, and EBP toolkit, environmental prompts, EBP mentor 4 weeks of training and 12 weeks implement</p>	<p>of VNSNY  N=46  22 in experimental and 24 in control  All female, most BSN, no significant difference in demographics between control and intervention group</p>	<p>satisfaction; (e) nurses' productivity; and (f) nurse turnover rate  Data collects pre, after 4 weeks of didactic, after implementation of project</p>	<p>Implementation Scale  Group Cohesion-measured by GCS  Nurses Job Satisfaction via Index of Work Satisfaction (IWS)  Productivity (visit by 1 RN during week)/ (days RN worked that week)  Turnover-measured via HR database</p>	<p>after completing the 16 week program, and after completing EBP project. Note: EBPB scale also given after 4 week intense didactic sessions</p>	<p>from 50% to 11% control group remained at 35% throughout</p>	<p>experimental &amp; control not completely random, rationale for control intervention not well defined-  Feasibility: study could reasonably be replicated  Conclusions: similar to other studies using same model and evaluation tools, increase in EBPB and EBPI significantly increased as is nurse turnover.  Recommendation's: further studies with better randomization,</p>
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Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
9. Lott, T. F., Hughes, R. G., & Johnson, E. (2020). The implementation of an evidence-based practice mentoring program. <i>Nursing Management</i> , 51(4), 11-14. <a href="https://doi.org/10.1097/01.NUMA.0000657292.87970.06">https://doi.org/10.1097/01.NUMA.0000657292.87970.06</a>								
To describe effectiveness of a cost-neutral EBP mentor program integrated into existing structure	IOWA Model of EBP to Promote Quality Care	Descriptive study	Community based system with 3 hospitals, one was Magnet® Sample comprised of nurses already participating in Nursing Excellence Council n not given	EBP Mentors: Self-efficacy w/ EBP  Clinical Nurses: EBP knowledge, skills, and utilization  % of projects that are nurse led or co-led	Evidence-Based Nursing Self-Efficacy Scale  EBPQ Scale  % of projects calculated	ANOVA and paired t-tests to compare pre/mid/post results  EBPQ scores pre (2017) and post (2019) compared	Mentors: scores increased at each interval p<.01  Clinical Nurses: EBP knowledge most scores slight increase none significant  EBP utilization improved significantly (p<.05)  300% increase in nurse led or co-led projects	II, B  Consistent w/ findings that EBP mentor is effective in increasing nurses' ability to engage in EBP, demonstrates how EBP mentorship aligns w/ Magnet® tenants

Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
10. Magers, T. L. (2014). An EBP Mentor and Unit-Based EBP Team: A Strategy for Successful Implementation of a Practice Change to Reduce Catheter-Associated Urinary Tract Infections. <i>Worldview of Evidence Based Nursing</i> 11(5), 341-343 <a href="https://doi.org/10.1111/wvn.12056">https://doi.org/10.1111/wvn.12056</a>								
To describe how an EBP mentor used an EBP model to reduce catheter associated urinary tract infection (CAUTI) rates in a long-term acute care hospital (LTACH)	None described though interventions consistent w/ ARCC framework	Rapid critical appraisal followed by EBP mentor lead team	Medium sized LTACH in south-easter USA	Catheter Days (CD)  CAUTI rates of infection	Compared baseline data from 6 months before intervention and 6 months after project implemented	t-test	26.1% reduction in CDs (p<.001)  33% reduction in CAUTI rate p=.49	V, A  Demonstrated improved patient outcomes following EBP interventions led by an EBP mentor and team.  Strengths: EBP methodology clearly described, patient outcomes improved, supports evidence that EBP programs improve patient outcomes,  Weakness: limited to one setting, unknown patient volume  Conclusions: EBP mentor lead projects

								<p>improve health care quality</p> <p>EBP clinical protocols including skillful nursing judgement and evidence improve outcomes</p> <p>EBP mentors are essential to promote quality and safety</p>
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Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
11. Melnyk, B. M., Fineout-Overholt, E., Giggelman, M., & Choy, K. (2017). A Test of the ARCC® Model Improves Implementation of Evidence-Based Practice, Healthcare Culture, and Patient Outcomes. <i>Worldviews on Evidence-Based Nursing</i> , 14(1), 5-9. <a href="https://doi.org/10.1111/wvn.12188">https://doi.org/10.1111/wvn.12188</a>								
To evaluate the effect of the ARCC model on organizational culture, EBP beliefs, EBP implementation, and patient outcomes	ARCC Model	Longitudinal pre-experimental design using pre & post t test  ARCC Model implemented over a year, focusing on development of EBP mentor	341 bed acute care hospital in San Francisco, CA  45 clinicians from nursing, pharmacy & allied health (out of 58)	EBPB, EBPI, organizational culture, and patient outcomes measured	Pre & post tests, retrospective review of patient outcomes  Data collection tools:  EBPB scale, EBPI scale, OCRSIEP scale,	T tests and effect sizes were calculated	EBPB, EBPI, and OCRSIEP all increased  Mobility project led to < vent days by 2.7  HAPI rate from 6.01 to 0.62%  CHF patient education 14.% reduction in readmission  Exclusive breastfeeding 61.7% to 71.1%	II, B  Worth to practice: suggests that using a systems focused model can improve EBP belief, implementation, and patient outcomes  Strengths: solid study design using validated tools, includes specific patient outcomes, improvement in patient outcomes over 12 years was significant.  Weakness: small sample, review of findings only explains projects with significant increase in patient outcomes, does not discuss how many total projects there were  Conclusions: Use of the ARCC model may increase beliefs and implementation of EBP as well as patient outcomes

Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
12. Morgan, L. A. (2012). A mentoring model for evidence-based practice in a community hospital. <i>Journal for Nurses in Staff Development</i> , 28(5), 233-237. <a href="http://search.ebscohost.com/login.aspx?direct=true&amp;AuthType=sso&amp;db=ccm&amp;AN=108103760&amp;site=ehost-live&amp;scope=site&amp;custid=s3818721">http://search.ebscohost.com/login.aspx?direct=true&amp;AuthType=sso&amp;db=ccm&amp;AN=108103760&amp;site=ehost-live&amp;scope=site&amp;custid=s3818721</a>								

To evaluate impact of a mentor-led EBP project on nurses' perceived barriers to EBP and HAPU prevalence	ARCC and Rogers Diffusion of Innovation	Descriptive Study	216 bed community hospital  Sample 23 RNs from wound and unit councils	RN perceived barriers to EBP  HAPU prevalence	BARRIER scale (Cronbach a 0.89)  NDNQI data collection tool for HAPU prevalence	BARRIER scale pre and post results analyzed using paired t-test  HAPU prevalence evaluated by comparing NDNQI data pre and post intervention	RN perceived barriers decreased in all subcategories p<.001  HAPU prevalence decreased by 5%	II, B  Mentor led-EBP project implementation improves clinician perception and quality outcomes  Limitations, small n, pilot study,
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Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
13. Royer, H. R., Crary, P., Fayram, E., & Heidrich, S. M. (2018). Five-Year Program Evaluation of an Evidence-Based Practice Scholars Program. The Journal of Continuing Education in Nursing, 49(12), 547-554. <a href="https://doi.org/10.3928/00220124-20181116-05">https://doi.org/10.3928/00220124-20181116-05</a>								
To evaluate long-term impact of a 5 year program to promote EBP in the organization	None	5 year pre/post  Intervention: 8 monthly workshops, EBP project w/ mentorship from a nurse scientist, projects shared at NGR	131 bed VA hospital  Sample-competitive application, FTE, manager recommendation, 2 yrs experience topic of interest n=47 RNs	Program completion rate  Workshop satisfaction  Program Satisfaction  EBP self-efficacy Scale  Engagement in EBP and Leadership  Qualitative Reflection	Satisfaction was measured after each workshop and upon completion of the program using surveys & w/ 5pt scale and open ended questions	ANOVA  Content analysis for open ended	High workshop and program satisfaction 4.7-5  EBP self-efficacy improved F(2,11) 30.0138 p<.01  Improvements in PD, scholarship, confidence, engagement in committee work	II, B  Strengths: captured experiences and perceptions of participants, findings consistent w/ other studies, demonstrates sustainability

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14. Spiva, L., Hart, P. L., Patrick, S., Waggoner, J., Jackson, C., & Threatt, J. L. (2017). Effectiveness of an Evidence-Based Practice Nurse Mentor Training Program. <i>Worldviews on Evidence Based Nursing</i> , 14(3) 183-191. <a href="https://doi.org/10.1111/wvn.12219">https://doi.org/10.1111/wvn.12219</a>								
To evaluate effectiveness of an EBP mentor training program  To evaluate effectiveness of creating formal infrastructure to integrate EBP into culture of organization	None discussed	Pre-test post-test quasi-experimental	66 EBP mentors  367 clinical nurses at  5 hospital integrated non-profit healthcare system in South-East USA	Conditions that impede or sustain EBP  EBP beliefs & attitudes  EBP Skill  EBP knowledge  EBP org support  EBP confidence (self-efficacy)	EBP Nursing Questionnaire  EBP Nurse Belief and Attitudes  EBP Nurse Skills  EBP Org Support  Confidence Scale	Descriptive statistics  Inferential statistics using IBM SPSS  Frequencies,	Mentors has improvements for all scales $p < .001$ for each  Clinical nurses also had improvements for all areas $p < .001$	II, A  Strong support for EBP as part of multi-intervention strategy to improve culture of EBP  Solid description of interventions for EPB mentor training and building infrastructure  Strengths: large sample, multiple sites, analysis of results showed significance, findings consistent with similar studies  Weakness: nurses volunteered for intervention- no randomization measurement of change in patient outcomes, minimal control  Recommendations: long term studies to evaluated interventions to sustain EBP and impact on patient outcomes

Purpose of Article or Review	Conceptual Framework	Design / Method	Sample / Setting	Major Variables Studied (and their Definitions)	Measurement of Major Variables	Data Analysis	Study Findings	Level of Evidence (Critical Appraisal Score) / Worth to Practice / Strengths and Weaknesses / Feasibility / Conclusion(s) / Recommendation(s) /
15. Warren, J. I., Montgomery, K. L., & Friedmann, E. (2016b). Three-Year Pre-Post Analysis of EBP Integration in a Magnet-Designated Community Hospital. <i>Worldviews on Evidence-Based Nursing</i> , 13(1), 50-58. <a href="https://doi.org/10.1111/wvn.12148">https://doi.org/10.1111/wvn.12148</a>								
To evaluate long term impact of a multifaceted strategy to promote EBP within an organization	ARCC Model	Retrospective descriptive study	380 bed hospital that is part of a 10 hospital system in MD	Attitudes re EBP, perception of EBP Implementation, perception of organizational readiness among Nurse Leaders and Clinical RNs	EBPB scale EBPI scale OCRSIEP scale	Linear models w/ fixed effects to examine difference in each outcome over time and by role (leader vs. clinical RN)	28% response rate  For EBPB Nurse leader scores significantly higher for both years but gap was smaller in second survey as nurse leader score did not increase significantly  Organizational readiness: increases near parallel and both significantly increased	II, B  Worth to practice: demonstrates some sustainability of results over time, highlights gap between nurse's perception of EBPI vs. actual rate of EBP adoption, shows importance of engaging nurse leaders and clinical nurses in the EBP process  Strengths: sufficient sample size, measures impact over 2 years, findings consistent w/ literature, good comparison in results between leaders & clinical RNS  Weakness: focus is on difference between leaders & clinical RNS does not describe in detail the changes overtime of clinical RNs  Conclusion: need more studies re long term impact of interventions to increase EBP at organizational level  Recommendations: incorporate EBP requirements into performance evals for nurse leaders, need strategies to address the inconsistency between self-reported outcomes and organizational level findings

**Appendix B**

**Interventions Synthesis Table for Review and Online Submission Only**

	1	2	3	4	5	6	7	8	9	11	13	14	15
<b>Fellowship &lt;3 months</b>	✓												
<b>Fellowship 3-6 months</b>	✓					✓		✓					
<b>Fellowship &gt; 6 months</b>	✓	✓					✓			✓	✓	✓	✓
<b>Classroom lessons</b>	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓
<b>Pre-work/ Flipped Classroom</b>							✓						✓
<b>Online Modules</b>					✓								✓
<b>Refresher sessions</b>		✓											
<b>Practice w/ steps of EBP</b>													
<b>EBP Project with 1:1 Coaching</b>				✓				✓					
<b>EBP Project with group coaching</b>	✓				✓	✓				✓	✓	✓	✓
<b>Learners teaching others</b>				✓	✓								
<b>Journal Clubs</b>				✓									
<b>Regular distribution of reinforcement materials (bulletins, soundbites, etc)</b>						✓							
<b>Printed materials</b>	✓	✓				✓			✓				
<b>Toolkit</b>	✓	✓						✓	✓	✓			
<b>Textbooks</b>													
<b>Establishing EBP mentorship structures</b>			✓						✓				
<b>Website/Digital repository</b>		✓				✓			✓			✓	✓
<b>Librarian Support</b>		✓	✓			✓							

Recognition/Dissemination Event

✓

**Appendix C**

**Outcomes Synthesis Table for Review and Online Submission Only**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
<b>Adherence to guidelines</b>	↑	NE	NE	NE	↑	NE	NE	NE	NE	↑	NE	NE	NE	NE	NE
<b>EBP Beliefs/Attitudes</b>	↑	↑	✓	↑	NE	↑	↑	↑	NE	NE	↑	NE	NE	↑	NE
<b>EBP Implementation/Utilization/Practice</b>	NE	↑	↑	↑	NE	↑	↑	↑	↑	NE	↑	NE	NE	NE	↑
<b>EBP Knowledge</b>	NE	NE	✓	↑	NE	NE	NE	NE	↑	NE	NE	NE	NE	↑	↑
<b>EBP Skills/Competence/Self-Efficacy</b>	NE	↑	NE	NE	NE	↑	↑	↑							
<b>Org Culture/ Readiness for EBP</b>	NE	↑	NE	↑	NE	NE	↑	NE							
<b>Perceived Barriers to Research Implementation</b>	NE	↓	NE	NE	NE										
<b>Job Satisfaction</b>	NE	NE	NE	NE	NE	NE	↑	NE							
<b>Group Cohesion</b>	NE	NE	NE	NE	NE	NE	↑	↑	NE						
<b>RN Turnover</b>	NE	↓	NE												
<b>Patient Quality &amp; Safety</b>	NE	NE	NE	NE	↑	NE	NE	NE	NE	↑	↑	↑	↑	NE	NE
<b>Staff Engagement</b>	NE	NE	NE	NE	↑	NE	NE	NE	↑	NE	NE	NE	↑	NE	↑
<b>Professional Development</b>	NE														
<b>\$ Savings/ Cost avoidance</b>	NE	NE	NE	NE	↑	NE									

NE- Not evaluated

