The Innovative Environment of the Engaged Nurse Scholar: Setting the Stage for a Nurse Scholar Program

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Jason Warren is a registered nurse with Dignity Health.

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Abstract

Background: The purpose of this project was a culture assessment on nurses' perception about evidence-based practice (EBP) prior to creating an EBP training program. EBP improves patient outcomes, job satisfaction and retention, and decrease healthcare costs.

Methods: A descriptive study design was used. Nurses at a hospital and outpatient cancer center were sent a voluntary anonymous survey through work email. 630 nurses were invited to participate, and 245 completed the survey with a response rate of 38.9%. The survey consisted of 3 instruments developed by Melnyk, along with demographic information.

Results: Most nurses surveyed answered "strongly agree" or "agree" to questions pertaining to EBP knowledge and implementation. "I believe that EBP results in the best clinical care for patients," resulted in 93.9% answering "strongly agree" or "agree." For questions referring to the organizational culture towards EBP, the results were less positive. Only 59.6% answered, "strongly agree" or "agree" to "My organization provides EBP mentors to assist clinicians in implementing EBP."

Discussion: Strengths and current EBP beliefs and practices can be identified through organizational assessment. This project will spur further discussion and knowledge growth of EBP practice, inspiring the nursing organization to examine current culture to create an innovative community.

Conclusions: Along with areas of strength including a positive knowledge and use of EBP in the organization, barriers to implementation such as leadership support were identified. These factors will influence further development of mentors and education and the formulation and implementation of the fellowship program.

Keywords: Evidence-based practice; research training, organizational culture, nurse scholar

The Innovative Environment of the Engaged Nurse Scholar:

Evidence-based nursing practice refers to the use of nursing research to guide practice and decision making (Leasure et al., 2008). The pool of evidence and research available to the clinician continues to grow, in the form of online databases, research and guidelines (Melnyk & Fineout-Overholt, 2019). While nurses are educated in critical thinking and skilled decision making, the translation and utilization of new research and evidence produced takes a time and faces many barriers. Resource utilization, cost, attitude and behavior, knowledge and understanding of evidence-based practice (EBP), access to search engines, and other issues have been implicated as obstacles to EBP implementation (Leasure et al., 2008). Many hospitals are implementing research training programs with varying degrees of success in engaging nurse staff and leadership to embrace EBP supported practice change (Black, Ali, et al., 2019; Friesen et al., 2017a). Hospital programs can be effective in the synthesis and dissemination of evidence and the implementation of practice changes (Jayakumar et al., 2016).

Background and Significance

Leasure et al. found that nurses do not access EBP resources routinely or effectively (2008). While encouraged to use EBP, nurses felt that they did not have the opportunity to be involved in research or EBP implementation projects. Bedside nurses are increasingly expected to be able to utilize EBP to inform their own practice. Research training programs have been created at various hospitals and educational institutions and these programs have been shown to have an encouraging effect on practice changes and nurse engagement (Black et al., 2019). However, nurses do not always have the opportunity or educational support to seek out new EBP. Lack of time, cost, limited knowledge and mentorship, and lack of leadership interest are

all barriers to nurses at the bedside translating research into practice (Koehn & Lehman, 2008). Nurses need to be empowered to identify practice needs, study the literature, and implement practice changes based on evidence. Climate and leadership behavior must be considered for any EBP practice change (Shuman et al., 2019). Nurse managers and executives play a critical role in establishing the practice environment that facilitates nursing staff empowerment towards scholarly nursing practice (Beal et al., 2008).

Recent studies have shown that exposure of undergraduate nursing students to EBP education had a positive effect on their understanding and attitude towards EBP practice (Reid et al., 2017). However, master's and doctoral prepared nurses have been shown to have a lack of knowledge of EBP implementation and the confidence to incorporate EBP into their practice (Moore et al., 2019). Koen and Lehman found that age and experience of nursing staff had a profound impact on the education and acceptance of EBP, thought to be related to initial education of EBP being absent, thus supporting the need for clinical training (2008). Lack of time and lack of support and incentive have been found to be significant barriers to nursing implementation of EBP (Hasanpoor et al., 2019). Both background training and facility-based training have a positive association with nurses' perceptions about EBP, highlighting the importance of establishing a culture of best practice (Melnyk et al., 2008).

Purpose and Rationale

Riley and Omery submit that nursing professionals on a personal level are obligated to participate in the "generation, utilization, and evaluation" of evidence-based practice (1996). This engagement of the "Nurse Scholar" places the professional nurse at the forefront of nursing as a practice discipline. Nursing scholarship benefits society through discovery, integration, teaching, and application. (Riley & Omery, 1996).

Nurse Scholars

Clinical nurses and nurse managers lead the charge in establishing a culture of EBP practice and implementation. Perception, knowledge, support, and mentorship are all factors in determining the extent to which EBP becomes a cultural norm (Koehn & Lehman, 2008; Moore et al., 2019; Riley & Beal, 2013; Wagner AL & Seymour ME, 2007). Studying this population to gain insight into barriers and areas in need of support will assist in creating the best environment for EBP program implementation. Various instruments exist to examine the education and perceptions of staff and managers and to utilize these findings to strengthen the environment to facilitate EBP implementation (Melnyk et al., 2008).

EBP Fellowship Programs and Evaluation

Research shows that the implementation of research training programs, research fellowship programs, mentorship programs, and EBP centers have positive effects on nursing staff's perception and engagement in EBP implementation (Black, et al., 2019; Friesen et al., 2017; Jayakumar et al., 2016; Kim et al., 2016). Various measures of nurse engagement and impact of programs can be measured using instruments such as the evidence-based practice beliefs scale and the EBP implementation scale (Friesen et al., 2017; Melnyk et al., 2008). Some hospitals have been able to implement EBP fellowship programs, showing success in equipping nursing staff to become "EBP champions" and mentors for newer staff (Kim et al., 2016). Nurses have been shown to respond well to programs that educate and promote EBP, which utilize support and resources like mentors and library staff (Friesen et al., 2017). Nurses also recognize that the education of the Nurse Scholar goes beyond initial education, and requires a blend of academic and clinical experience (Riley & Beal, 2013).

Engagement and Empowerment

Establishing an innovative practice environment encourages EBP, values nursing input, and supports nursing educational development and the professional scholar. Multiple programs have been shown to increase in the positive perception of EBP and implementation, resulting in nurse scholars and nurse scientists that produce quality EBP that drives the nursing profession as a practice doctrine (Friesen et al., 2017b; Jayakumar et al., 2016; Riley & Beal, 2013).

Innovative EBP education has become integral in the innovation and improved quality of care given by nurses. More nurses are becoming exposed to EBP and can be involved in educational programs. The barriers to implementing best practice fall away as more hospitals develop avenues to support and empower Nurse Scholars to search the literature, seek out best practices, and implement these practice changes within their units.

Internal Evidence

A large health care system in the greater Phoenix area is interested in implementing an Evidence-Based Practice Fellowship Program (EBPFP) in their multi-hospital system. Two initial steps are to find out the cultural acceptance of EBP in the system, and to seek out Nurse Scholars that will actively engage with the program, and to identify managers of units that are willing to implement EBP practice changes. The organization aims to create a dynamic community across their system that have the skills, support, and desire to generate new knowledge, innovation, and process improvement.

PICOT Question

This inquiry has led to the PICOT question, "Among the nursing and administrative staff of a large hospital organization, how does the implementation of an EBP fellowship program

(EBPFP) vs. no EBP fellowship program facilitate engagement and participation in a one-year cycle of the program.

Evidence Synthesis

To answer this important PICOT question, a broad search of several databases was performed. These databases included the Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline, and PubMed, and Psycinfo. Keywords used included: *nurse, evidence-based practice, EBP implementation, and program.* Expanders were used to capture variations in "nurse," including *nursing,* and *nurses.* The initial search of nurs* AND evidence-based practice AND EBP implementation AND program led to a total of 103 results in CINAHL, 180 results in Medline, 143 results in PubMed, and 59 results in PsycINFO. Search limits were set to include only articles published between the years of 2016 and 2021. This narrowed the results to 64 in CINAHL, 27 results in Medline, 79 results in PubMed, and 27 results in PsycINFO. Further filters included the English language, peer reviewed journal articles. An exclusion search term *student* was used to exclude any student-based research, focusing on practicing clinicians in the hospital setting. These search limits produced a total of 48 results in CINAHL, 20 results in Medline, 64 results in PubMed, and 17 results in PsycINFO for a grand total of 149 articles. Because of the variations in terminology describing nurse scholar programs, other search strategies were incorporated, including citation reviews.

Review of article abstracts produced an inclusion criterion of hospital based "fellowship" or "Scholar" programs designed to educate clinicians to implement practice changes and excluded any specific intervention related studies. 20 articles were selected, and rapid critical analysis was done, with 10 final articles chosen for this literature review. Exclusion criteria included articles describing specific EBP practice changes and evaluations.

Critical Appraisal and Synthesis of Evidence

Studies were evaluated using rapid critical appraisal (RCA) as indicated in the search strategy (Melnyk & Fineout-Overholt, 2019). Studies consisted of an equal number of pretest-posttest forms and cross-sectional surveys. Although these studies indicate a lower level of evidence, they are instrumental in measuring the attitudes, knowledge, and frequency of EBP in the organization, along with measurement of these variables based on the integration of educational programs implemented in the organization.

Five studies utilized the ARCC model as a guiding framework, two used the PARHIS model, the Iowa model was used once, and two studies failed to identify a guiding framework or model. Most studies were done in large hospital systems, with 70% of studies based in the United States. The mean sample size was 341. The average years of experience of those sampled was 15 years, and the average age of those sampled was 41. These studies mostly utilized widely reliable and validated survey instruments including the Evidence Based Practice Beliefs Scale (EBPB), Evidence Based Practice Implementation Scale (EBPI), and the Organizational Culture and Readiness Scale for System-Wide Integration of Evidence-Based Practice Scale (OCR-SIEP). The five studies utilizing pretest-posttest methods surveyed participants in programs focused on EBP education and mentorship. Various methods were used to evaluate survey results with an overall increase in EBP knowledge and beliefs of participants.

Conclusions from Evidence

EBP implementation has been proven to be indicated in increased positive patient outcomes, nursing job satisfaction and retention, with a decrease in overall healthcare costs to the system. With this evidence, innovated leaders are examining their hospital systems and utilizing tools to assess organizational readiness for the adoption of EBP practices. As evidenced by these

studies and others, nursing staff and leadership can increase their capacity for EBP through education and engagement. The culture of EBP has the potential to perpetuate decreased hospital costs, increased positive patient outcomes, and increased engagement, job satisfaction, and retention for nursing staff.

Theoretical Framework

An underlying framework useful in the innovation of healthcare organizations is Roger's Diffusion of Innovation theory (Rogers, 2003). This theory suggests that innovations are developed and adopted slowly, spreading through organizational pieces in a predictable manner. Rogers introduces five groups of individuals that constitute an organization. The introduction of process changes, new ideas or behaviors are initially presented and adopted by small groups of individuals, called Innovators. The innovator in relation to my project is the CNO of the hospital system with the vision of a EBP fellowship program, along with his team of stakeholders that design and create the program. Early Adopters represent the second slightly larger group, called early adopters. Within the fellowship program, this group will be represented by the participants in the program, or "Scholars." With training in the fellowship program, they then can utilize their knowledge to influence the rest of the organization. The final 3 groups consist of the Early Majority, Late Majority, and Laggards, which make up the bulk of the organization. Within my project, these groups represent the rest of the hospital system and will benefit from the EBP Scholars project implementation and exposure to EBP. In the hospital system, the implementation of EBP champions, clinical mentors, and leaders will affect change through their own EBP implementation. projects, and to inspire further EBP focus and pursuit from their peer colleagues. This project will help to define these groups through an assessment of the culture, beliefs, and attitudes of the nursing organization towards EBP. This assessment will help to

identify those Early Adopters, creating a fertile ground for the dissemination of EBP to the rest of the organization.

Implementation Framework

Barriers to organizational change are well known and documented. Multiple models exist for guidance in organizational innovation through the implementation of EBP. The Advancing Research & Clinical Practice through Close Collaboration (ARCC) model is a well-known and effective model that has been used extensively in the incorporation of EBP at the organizational level (Melnyk & Fineout-Overholt, 2019). It applies not only to implementing EBP at the clinical level, but the overarching application of the organization's EBP culture. The first step in the ARCC model involves assessing the organizational cultures and readiness for system-wide change. Through assessment, strengths and barriers to EBP implementation can be identified and addressed by the leadership. As a further step, EBP mentors are developed who are knowledgeable and passionate about building a sustainable EBP culture. These mentors work with staff to stimulate and educate, guiding EBP practice changes and overall EBP cultural increase. With increased EBP, the ARCC model suggests that patient outcomes are improved, nurse job satisfaction and turnover is improved, and these factors result in decreased healthcare system costs. Specific barriers such as a lack of knowledge or skills, or a lack of perceived leadership support can be identified and addressed. Strengths related to the implementation of EBP fellowship programs, such as a high degree of EBP beliefs and support can be cultivated and encouraged. Utilizing this data can help organizations to sustain an EBP culture that has the potential to influence each nurse to support their own practice with EBP.

Methods

The project design was a cross-sectional survey. Institutional Review Board approval was obtained from the organization on September 22, 2021 and received exemption status from Arizona State University Institutional Review Board on October 26, 2021.

The project utilized demographics and questionnaires as instruments for data gathering. These instruments have high validity. There were three specific instruments used, each containing three questions for total of nine questions. (Melnyk et al., 2021). The first was the EBP Beliefs Scale – Short Version, which at the time of use had a Cronbach alpha of 0.81. The second was the EBP Implementation Scale – Short Version with a Cronbach alpha of 0.89, and finally the Culture and Readiness Scale – Short Version with a Cronbach alpha of 0.87. These tools were shortened versions of similar surveys also developed by Melnyk. The shortened versions' convergent validity was between $r = .42$ and $r - .72$ ($p < .001$) which is acceptable. Permission to utilize these instruments was obtained. Seven demographic questions were also included, which asked age, gender, highest level of education, years of RN experience, years of employment with the organization, type of facility employed at, and current nursing role. At the end of the survey period, all surveys completed were collected by an employee of the organization associated with the research team.

This project was based in a large urban hospital organization in Arizona, consisting of six large hospitals and two surgery centers with a total of 1426 beds. This organization employs approximately 4,400 RNs. Five of the six hospitals are Magnet accredited, and two are level one trauma centers. Currently there are no formal training opportunities for nurses to engage in EBP development. There are some advancement opportunities, in the form of a clinical ladder, but no systematic or organizational focus on EBP education or implementation. To increase the amount

of EBP development in the nursing staff of this system, the Chief Nursing Officer (CNO) of one of the hospitals championed the development of a research program. This program was forecasted to begin in January of 2022 and was designed be a 1-year program consisting of didactic training with both in-person and virtual classes consisting of 4-hour sessions once per month with assignments and work between sessions. The didactic portion focused on learning about EBP, both research and the translation of research to practice, with additional education on innovation, utilizing time in the ASU HEALab. In addition, the participants address specific concerns and develop evidence-based clinical solutions to apply on their units while under the mentorship of an experienced nurse scholar/scientists. The CNO was instrumental in garnering support from other key leadership and obtaining the funding necessary to support for the program. Other stakeholders include several key faculty members at an area university, which is serving as an educational institution partner to aid in curriculum development and provide faculty to serve as mentors to the nurses enrolled in the program. Finally, nurses associated with the organization are important stakeholders. As the point-of-service personnel of the hospital, nurses with increased knowledge and skill pertaining to EBP will be highly instrumental in shifting the organizational culture to one of system-wide EBP implementation and high-quality care delivery.

Planning the Intervention

The primary goal of this project was an organizational culture assessment on nurses' perception about EBP. Evaluation of this system attempted to identify organizational strengths and weakness and assist leaders in tailoring the program toward identified needs, while also identifying potential barriers that can be addressed. Utilizing the ARCC model, this project served as an initial inquiring into the beliefs and exposure of the nursing organization. After

carefully examination of the literature, several survey tools were decided upon to study the current landscape and culture. Considering that this was an initial examination, these proven survey instruments will be able to be utilized after the fellowship program has been implemented to assess for changes in organizational culture and RN beliefs and implementation of EBP. With assessment of the organizational culture completed and analyzed, strengths and current EBP beliefs and practices can be identified. The survey will also act as a catalyst for further discussion and knowledge growth of EBP practice, inspiring the nursing organization to examine current practices and culture and help to create an innovative community that possess the skill to translate knowledge and innovation into practice. Also identified will be barriers to implementation such as nursing inadequate knowledge or beliefs associated with EBP, and support issues such as leadership resistance to change. These factors will influence further development of mentors and education and the formulation and implementation of the fellowship program.

Participants and Recruitment

The participants of this project include 630 registered nurses employed at one hospital in the system and an outpatient cancer care network. Inclusion criteria included full, part-time, and prn registered nurses and nursing leadership. Nursing personnel consisting of point of care nurses, administrators, nurse managers, clinical nurse specialists, and advanced practice nurses. Participants had to have the ability to read and write in English. Excluded were non-RN staff (Nursing Assistants, pharmacy staff, doctors, ect.).

Data Collection and Outcome Measurement

Participants in this project were recruited to participate in the survey through their work email. An information letter about the project was included with the survey with the following

wording: "Completing the survey will be considered your consent to participate in the project." No paper consent forms were stored. To ensure the confidentiality of participants, the anonymous responses setting was utilized on the survey development software by disabling IP address tracking and email address tracking. The survey did not include identifiable questions. The survey was sent out in November with a link to an online survey built through Survey Monkey, which was available for one week.

Results

A total of 245 participants completed the nine questions regarding EBP, with a response rate of 39%. Between 225 and 237 participants answered the demographic questions.

225 participants answered the question of age with 20 skipping. Completed responses indicated that 22 (9.8%) were 18 to 25, 75 (33.3%) participants were 26 to 35, 61 (27.1%) participants were 36 to 45, 40 (17.8%) participants were 46 to 55, 24 (10.7%) participants were 56 to 75, 3 (1.3%) participants were 66 to 75, and no participants were over 76. 229 participants completed the question of gender while 16 did not answer. Completed responses indicated that 34 (14.9%) participants were male, while 193 (84.3%) were female, and 2 (0.9%) chose “other.” Looking at years with the organization, 230 answered and 15 skipped. Responses indicated that 77 (33.5%) had less than 1 year, 61 (26.5%) and 1 to 3 years, 26 (11.3%) had 4 to 5 years, 30 (13%) had 6 to 10 years, 20 (8.8%) had 11 to 15 years, 6 (2.6%) had 16 to 20 years, 6 (2.6%) had 20 to 25 years, and 4 (1.8%) had more than 26 years at this organization. For years of experience, 231 answered and 14 skipped. Responses indicated that 26 (11.3%) had less than 1 year, 32 (13.9%) had 1 to 3 years, 29 (12.6%) had 4 to 5 years, 52 (22.5%) had 6 to 10 years, 33 (14.3%) had 11 to 15 years, 15 (6.5%) had 16 to 20 years, 8 (3.5%) had 20 to 25 years, and 36 (15.6%) had more than 26 years of nursing experience. For the question “type of facility primarily

working at," 237 participants answered and 8 skipped. 197 (83.1%) answered "hospital," and 40 (16.9%) answered outpatient. For participants highest level of education, 236 answered and 9 skipped. 2 (0.9%) participants reported diploma. 36 (15.3%) participants reported having a associates degree. 162 (68.6%) reported a bachelors degree, 35 (14.8%) reported master's degree, and 1 (0.4%) reported a doctorate (PhD, DNP, DNSc, or other). When questioned about their nursing role, 233 participants answered and 12 skipped. 189 (81.1%) identified as clinical nurses. 19 (8.2%) identified as supervisors. No participants identified as advanced practice. 10 (4.3%) identified as management/leadership. 1 (0.4%) identified as an educator. 14 (16%) answered "other."

Interestingly, while 173 (75%) nurses who identified their years of experience had 4years of experience or more, 138 (60%) of nurses answered that they had 3 or less years of employment at this facility.

EBP Beliefs Scale – Short Version

For the question "I believe that EBP results in the best clinical care for patients," 146 (59.6%) signaled that they "strongly agree," 84 (34.3%) signaled "agree," 12 (4.9%) chose "neither agree nor disagree," 1 (0.4%) chose "disagree," and 2 (0.8%) chose "strongly disagree." For the question "I am sure that I can implement EBP," 120 (49%) signaled that they "strongly agree," 103 (42%) signaled "agree," 19 (7.8%) chose "neither agree nor disagree," 2 (0.8%) chose "disagree," and 1 (0.4%) chose "strongly disagree." For the question "I am sure that implementing EBP will improve the care that I deliver to my patients," 131 (53.5%) signaled that they "strongly agree," 94 (38.4%) signaled "agree," 18 (7.4%) chose "neither agree nor disagree," 0 (0%) chose "disagree," and 2 (0.8%) chose "strongly disagree."

EBP Implementation Scale – Short Version

For the question "I use evidence to improve patient outcomes in my healthcare setting," 108 (44%) signaled that they "strongly agree," 117 (47.8%) signaled "agree," 18 (7.4%) chose "neither agree nor disagree," 1 (0.4%) chose "disagree," and 1 (0.4%) chose "strongly disagree." For the question "I implement the steps of the EBP process in my practice," 96 (39.2%) signaled that they "strongly agree," 120 (50%) signaled "agree," 28 (11.4%) chose "neither agree nor disagree," 0 (0%) chose "disagree," and 1 (0.4%) chose "strongly disagree." For the question "I promote the use of EBP in my healthcare setting to improve outcomes," 106 (43.2%) signaled that they "strongly agree," 118 (48.2%) signaled "agree," 19 (7.8%) chose "neither agree nor disagree," 1 (0.4%) chose "disagree," and 1 (0.4%) chose "strongly disagree."

Culture and Readiness Scale – Short Version

For the question "My organization has a culture that supports clinicians to implement evidence-based practice," 86 (35.1%) signaled that they "strongly agree," 121 (49.4%) signaled "agree," 32 (13.1%) chose "neither agree nor disagree," 5 (2%) chose "disagree," and 1 (0.4%) chose "strongly disagree." For the question "My organization has readily available resources to implement evidence-based practice," 77 (31.4%) signaled that they "strongly agree," 106 (43.3%) signaled "agree," 47 (19.2%) chose "neither agree nor disagree," 13 (5.3%) chose "disagree," and 2 (0.8%) chose "strongly disagree." For the question "My organization provides EBP mentors to assist clinicians in implementing EBP," 62 (25.3%) signaled that they "strongly agree," 84 (34.3%) signaled "agree," 67 (27.4%) chose "neither agree nor disagree," 27 (11%) chose "disagree," and 5 (2%) chose "strongly disagree."

Due to a variety of factors, the raw data associated with the survey was unavailable to the author. The initial intention was to run descriptive and inferential statistical analysis on the data.

Only a summary of participant responses was provided as previously described. This limitation prevented the authors from further data analysis and comparisons.

Discussion

These findings indicated that while nurses believe strongly that EBP is important in their practice, more efforts can be made to empower staff with mentorship and resources necessary to fully implement EBP. The culture of EBP has the potential to impact the organization through decreased hospital costs, increased positive patient outcomes, and increased engagement, job satisfaction, and retention for nursing staff. Assessing the organizational culture prior to the implementation of a research program is itself based in evidence. Through this assessment, the organization can tailor its program specifically to the barriers and facilitators that the nursing staff identified. This will aid in a successful implementation of the program, resulting in a greater increase in EBP practice changes that will promote lasting changes that will benefit patient outcomes, nurse engagement and satisfaction, and the hospital system. Unfortunately, due to several factors, the organization decided to forego the development of a scholar program as previously designed. Instead, the organization used a program developed by a midwestern university that performed a weeklong intensive training in EBP for their nursing and leadership. While not the type of local and sustained program initially desired, the efforts to advance the culture of EBP in the organization were still accomplished. This “compromise” represents the difficulty that comes with organizational cultural change. Leadership vision, communication, and cooperation are all vital when it comes to affecting change both at the micro and macro level.

Limitations

Several factors negatively affected this project and its implementation. As is the case with all one-point-in-time surveys, participant responses are inherently biased to their situation and specific culture. A response rate of 39% also could have contributed to sampling bias. As this survey only examined the nursing population of one hospital and outpatient network, generalizability is difficult. Additionally, 83% of the respondents were from an inpatient setting, creating an imbalance of representation. During the time just prior to implementing the survey, nursing staff had undergone a biannual system wide employee engagement survey. This could have resulted in "survey fatigue" and have been a cause of the low response rate. The COVID-19 epidemic was in full force during this time as well, which has had well documented effects on employee moral and engagement, thus also could have resulted in a low response rate and could have affected responses. Finally, system wide changes including the CNO moving to a different hospital may have affected the project.

Conclusion

EBP implementation has been proven to be indicated in increased positive patient outcomes, nursing job satisfaction and retention, with a decrease in overall healthcare costs to the system. With this evidence, innovative leaders are examining their hospital systems and utilizing tools to assess organizational readiness for the adoption of EBP practices. As evidenced by these studies and others, nursing staff and leadership can increase their capacity for EBP through education and engagement.

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Appendix A

Synthesis Table

Evaluation Table Quantitative Studies

Citation	**Theoretical/ Conceptual Framework**	**Design/ Purpose**	**Sample/Setting**	**Variables**	**Measurement/ Instrumentation**	**Data Analysis**	**Results/ Findings**	**Level of Evidence; Application to practice/ Generalization**
Friesen et al. (2017) Findings from pilot study: EBP to the bedside **Country:** USA **Funding:**	Roger's Diffusion of Innovations Theory ARCC model Ottawa model JHNEBPM	**Design**: Pretest-post test **Purpose**: To assess the pilot implementation of a EBP exemplar model in a large multihospital system	**n** = 57 **Demographics** M age = 42.63 BACC = 66.7% M YE = 12.95 **Setting** Multihospital system	IV EBP competency building program DV 1 - EBP beliefs DV 2 - EBP implementation	EBPB Scale EBPI Scale	Descriptive statistics one sample t-tests	DV 1 t = no statistically significant change ($p>0.1$) DV 2 t = 1.75 ($p<0.05$)	**LOE**: 3 **Strengths** Extensive study of existing program **Limitations :** Small pilot study with purposeful

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Citation	Theoretical/ Conceptual Framework	Design/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Seed grant from hospital system **Bias:** None listed			**IC** – nursing staff of pilot units **EC –** non unit staff					sampling, may not be generalizable. Study did not measure useful information like degree of participation and tracking individuals over time.

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								Conclusions: Overall useful study in examining usefulness of EBP education and the use of the ARCC model for structured framework. Also the used of the JHNEBPM

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								to guide education will be good to emulate. Also references to the Roger's theory as a guide to learning theory will be useful.
(Hasanpoor et al., 2019)	None provided.	**Design:** Cross-sectional	**N=212** **f=** 63% **BACC** = 63%	**IV** – Nurse managers of hospital system	EBMgt Questionnaire (Cα .89)	Descriptive statistics	**EBMgt Questionnaire**	**LOE:** III

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Nursing Managers' Perspectives on the facilitators and barriers to Implementation of EBMgt **Country**: Iran **Funding**: None listed **Bias**: None listed		**Purpose:** To assess nursing manager's perspectives on the facilitators and barriers to implementation of EBMgt in large hospital system in Iran.	**M age** = 41 **YE** = 17 **Setting:** Large hospital system in Iran **IC –** nursing managers of hospital system **EC –** Non-nursing managers	**DV1**: factors associated with barriers to EBMgt **DV2**: Factors associated with facilitators of EBMgt	1. Overall Barriers and sub questions 2. Facilitators Barriers and sub questions	independent t tests ANOVA Pearson Correlation	**DV1** (0-100) M = 63.20 **DV2** (0-100) M = 61.72	**Strengths:** Large sample size and response rate **Limitations:** Only management perspective, self-survey. **Conclusions:** Nurse managemen

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								t plays important role in implementing EBP, and are integral in identifying barriers to implementation
(Kim et al, 2017)	ARCC	**Design:** Pretest-posttest Quasi-experimental	**N**=120 **Demographics**:	IV – EBP fellowship program	Descriptive statistics Paired t-tests	EBPB Scale EBPI Scale	**DV1** ESI = +5.65, p<.001	**LOE**: III **Strengths:** Findings

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Evaluating the effect of a regional EBP fellowship program. Country: United States Funding: None listed Bias: None stated		**Purpose:** To determine whether a EBP Fellowship program improved EBP beliefs, implementation, job satisfaction, group cohesion and group attractiveness in participants.	M age = 42 YE =16 BACC = 47.5% SN = 52.5 % **Setting** Mentors (43) and fellows (77) of a EBP fellowship program based out of a large, multi-hospital center with academia involvement.	**DV1**: EBPB **DV2**: EBPI **DV3**: JS **DV4**: GR-COH **DV5**: GR-ATTR **DV6**: Relationship between variables	Bivariate Pearson's correlations Level of significance $p < .05$ Path analysis	JS Scale GR-COH Scale GR-ATTR Scale	**DV3** ESI = +9.84, p<.001 **DV3** ESI = +0.38, p<.047 **DV4** ESI = +1.03, p<.014 **DV5** ESI = +0.03, p<.889 (not significant)	support previous studies. Good completion rate **Limitations:** No randomization and control groups, not generalizable to nursing staff due to

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			IC – program participants **EC –** non-program participants				**DV6** ↑EBPB + ↑JS r = .27, p=.003 ↑GR-ATTR + ↑JS r = .27, p=.003 ↑GR-ATTR + GR-COH r = .26, p=.005 ********** **No correlation between** ↑EBPB + ↑EBPI	selecting nurses already involved in EBP fellowship **Conclusions:** Comprehensive study positive effects of an EBP fellowship program with

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								continued success in improving EMP implementation in medical institution. Benefits also show to academia partnership with institution.
(Melnyk et al., 2017)	ARCC model	**Design** Pretest/posttest longitudinal pre-	**N**=45	**IV** – ARCC model	OCR-SIEP EBPB Scale	t-tests effect sizes	**DV1** t+3.9, p = .00 effect size = .70	**LOE**: 3 **Strengths**

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ARCC model Improves implementation of EBP, culture, and patient outcomes **Country** USA **Funding**: None listed **Bias:** None stated		experimental design **Purpose** To examine impact of ARCC model on organizational culture, clinicians' EBP beliefs and implementation, and patient outcomes at one health-care system	**No Demographics given** **Sample:** Interprofessional HCPs Convenience **Setting** 341 bed hospital in San Francisco Bay area **IC** – Participants in	**DV 1** Organization Culture **DV 2** Individual nurse beliefs and **DV 3** Implementation	EBPI Scale	p .05	**DV2** t = 4.2, p= .00, effect size 0.62 **DV 3** t = 12.9, p= .00, effect size = 2.3	Strong findings towards effectiveness of ARCC model **Limitations:** Not much tabulated information about study Little demographic information

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			12-month EBP workshop **EC** – nonparticipants					Narrow research findings No limitations discussed, **Conclusions:** Study focused on the results of a specific program implementation at one hospital. Generalizati

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								on suffers. And that the way the cookie crumbles.
(Mudderman et al., 2020) Effect of EBP Program on knowledge, practice, and attitudes toward EBP in rural hospital **Country:** USA	Iowa Model Revised	**Design** pretest-posttest nonexperimental **Purpose** Determine the effect of an EBP education and mentoring program on the knowledge,	**N=9** **Demographics: nursing** – 7 **non-nursing** – 2 **Nurses' highest education** ASSC: 44% BACC: 33%	IV: EBP education and mentoring program **DV1:** Total EBPQ Score **DV1:** EBP knowledge **DV2:**	EBPQ (Cα .87) **EBPQ subscales:** EBPQ knowledge (Cα .91) EBPQ practice	Descriptive Statistics Wilcoxon matched-pairs tests (small sample size)	**DV1** ↑ +1.38, p=.011 **DV2** ↑ +1.3+, p=.008 **DV3** ↑ +2.16, p=.015 **DV4** ↑ +1.00, p=.106*	**LOE – III** **Strengths:** results agree with similar studies **Limitations :** Very small study, convenience

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Funding: none listed **Bias:** none listed		practice, and attitudes toward EBP among staff nurses and clinicians in a rural CAH.	**Setting** 25 bed CAH in Midwest	EBP Practice **DV 3**: EBP attitudes	(Cα .85) EBPQ attitudes (Cα .75)		*not significant	sample, change in mentors during study, cited costs **Conclusions:** EBP programs in rural and small settings shown to increase nurse EBP knowledge

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(Pereira, et al. 2018) Beliefs and Implementation of EBP among CHN working in CHC Country: Switzerland Funding: Bias:	ARCC	**Design:** Cross-Sectional Descriptive **Purpose:** Describe beliefs about EBP and record levels of implementation.	**N=100** **f=** 88% **M age =** 45 **YE =** 20.3 **BACC =** 57% **IC –** Nursing staff in regional CHC **EC –** Students, contracted RNs, >3 months experience.	**IV** – CHN **DV1** – EBPB **DV2** – EBPI **DV3** – Association between EBPB and EBPI	EBPB Scale (range 16-80) (Cα = .84) EBPI Scale (range 0-68) (Cα = .92)	Descriptive Statistics Kolmogorov-Smirnov test for equality of variances Spearman correlation coefficient	**DV1** M = 53.11 **DV2** M = 12.51 **DV3** (ρ=.764, p<.001)	**LOE –** III **Strengths:** Findings similar to other studies. **Limitations:** Geographically limited, not generalizable, smaller response

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								rate, Lack of understanding resulted in decreased participation in survey, **Conclusions:** Found a positive correlation between nurses EBP beliefs and implementation. Nurses

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								report positive feelings about EBP, but implementation remains low. Culture and opportunity are essential for more EBP focused care.
(Spiva et al., 2017)	None stated	**Design:** 2 group pre-test-posttest,	**n** = 66 mentors **n** = 367 nurses	**IV1**: Formalized	Evidence-Based Nursing	Descriptive and	**DV1**:	**LOE:** III

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Effectiveness of an EBP nurse mentor training program **Country:** USA **Funding:** none listed **Bias:** none listed		quasi-experimental, interventional **Purpose**: 1. To investigate the effectiveness sofa mentor training program on mentor's perception of EBP and research utilization 2. To investigate the effectiveness	**Demographics:** Mentor subset M age: 42.9 Y Exp: 15.9 BACC: 71% Nurse subset M age 45.9 M YE: 19 BACC: 54% No statistical differences found in demographics.	Mentor and nurse training program for EBP **DV1: Mentors knowledge** **DV2: Mentors confidence** **DV3: Nurses knowledge**	Questionnaire (nurses and mentors) Confidence Scale (mentors) Barriers to Research Utilization Scale (nurses) EBP Nurse Leadership (nurses)	inferential statistics Paired t-tests Frequencies, percentages, means, standard deviations.	t = -8.64; p=<.001 **DV2:** t=-6.36; p=<.001 **DV3:** t = -19.12; p=<.001 **DV4:** t = 20.86; p=<.001 **DV5:** t = -20.18; p=<.001	**Strengths**: Good retention of mentor group, Findings are similar to other studies **Limitations** : Non-randomized. Some delay in nurse training resulted in

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		of creating a structure to enculturate EBP to prepare nurses to incorporate EBP into practice .	**Setting:** Convenience sample of registered nurses and nurse mentors in a hospital system in the southeast	**DV4: Nurses perceived barriers** **DV5: Nurse EBP work environment** **DV6: EBP Nurse leadership**	EBP Work Environment Scale (nurses)		**DV6:** t = -16.50; p=<.001	high attrition of nurse group **Conclusions**: A mentorship program was effective in improving EBP knowledge, attitude, skill, and confidence

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								levels nurses training to be mentors. A culture of EBP is assisted by well-educated mentors. Feasibility
(Shuman et al., 2018) Unit leadership and climates for EBP Implementation	PARHIS framework	**Design** cross-sectional **Purpose** 1. Describe NMs self-	**N = 310** **n = 23 (NM)** **n = 287 (SN)** **Demographics**	**IV:** NMs and SNs **DV1:** EBP Competency	NM- EBPC ILS ICS	Descriptive Statistics independent t-tests with	**DV1 (0-3)** M=1.62 **DV2 (0-4)** M = 2.88 (SN) M = 2.73 (NM)	**LOE:** III **Strengths:** Multiple units in

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Country: USA **Funding**: None stated **Bias**: None stated		perceptions of EBP competency 2. Describe NMs EBP leadership behaviors as perceived by self and SNs 3. Describe SNs and NM's perception of unit climate for EBP	**f** = 87%(NM), 84% (SN) **BACC** = 52%(NM), 59% (SM) **M Age** = 42 (NM), 35 (SN) **YE** = 16 (NM), 8 (SN) **Sample** Convenience sample of 24 units of 7 hospitals in Midwest and Northeast.	**DV2**: Leadership behaviors **DV3**: Climate perception		Bonferroni correction	**DV3 (0-4)** M = 2.24 (SN) M = 2.16 (NM)	multiple hospitals **Limitations:** Convenience sample, not generalizable, only adult med-surg, some subscales (ILS) had low reliability

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		4. Compare SN and NMs perceptions of EBPI leadership behavior and climate	IC – adult care units, have eligible nurse manager **EC –** mother-baby, pediatric, neonatal, psychiatric, and ICU unit RNs					**Conclusions:** Nurse managers play a vital role in EBP implementation. Unit climate, leadership EBP competency needs to improve.

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(Warren et al., 2016) No space Strengths and Challenges of Implementing EBP in Healthcare Systems **Country:** **Funding:** **Bias:**	PARIHS Dillman's	**Design** **Cross-Sectional** Survey design **Purpose** To describe RN's attitudes, beliefs, and perceptions about EBP and examine differences in demographics, professional characteristics, and leadership differences	**N**= 1608 **Demographics** **f** = 92% **YE**= 17 **BACC** = 52% **Setting** Large hospital system in Northeast **IC –**RNs in hospital system **EC –** non-RNs	**IV:** RNs in large hospital system **DV1:** EBP Beliefs **DV2:** EBP Implementation **DV3:** Organizational Culture survey	EBPB Scale (Cα .90) EBPI Scale (Cα .95) OCRSIEP Scale (Cα .95)	Descriptive Statistics ANOVA Levene's test Tukey HSD Welch ANOVA Games-Howell post hov	**DV1:** Know how to use EBP to make practice changes (41%) **DV2:** Access to EBP resources - 49% **DV3:** Little to no readiness - 64%	**LOE – III** **Strengths:** Findings consistent with other studies, large sample despite low response rate **Limitations :** Low response rate, self-

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								reported data. Not generalizable. **Conclusions:** EBP culture assessment prior to program implementation can identify baseline culture. Mentorship

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								and support from nurse leaders are critical to successful integration of an EBP culture. **Feasibility**
(Yoo et al. 2019) Clinical nurses' beliefs, knowledge, organizational readiness, and	ARCC model	**Design:** Descriptive and cross-sectional design **Purpose**	**N= 521** **Demographics:** **M age** = 31.69 **M YE** = 9.0 years **f** = 93.3%	**IV: Clinical nurses in hospital system** **DV1:** EBP knowledge	EBP Knowledge Questionnaire EBP Beliefs tool OROC-SIEP	Inferential statistics Descriptive Statistics	**DV1** 52.5/98 **DV2** 51.7/80 **DV3**	**LOE –** III **Strengths** – Large sample, good power,

Key:– **ANOVA** – Analysis of variance; **ARCC** -Advancing Research and Clinical Practice through Close Collaboration; **BACC** – Baccalaureate or higher; **Cα** – Cronbach's α; **CAH** – Critical Access Hospital; **CHC –** Community Health Center; **CHN –** Community Health Nurse; **CNS –** Clinical nurse specialist; **DV**-dependent variable; **EBMgt** – Evidence Based Management; **EBN** – Evidence Based Nursing; **EBP** – Evidence Based Practice; **EBPB** – Evidence Based Practice Beliefs; **EBPI –** Evidence Based Practice Implementation; **EBPK** – Evidence Based Practice Knowledge; **EBPQ** – Evidence-Based Practice Questionnaire; **EC –** Exclusion Criteria; **ESI** - Effect size improvement (posttest score minus pretest score); **f** = female; **GR-ATTR** – Group attractiveness; **GR-COH** – Group Cohesion; **HCP** – Healthcare Professionals; **IC –** Inclusion Criteria; **ICS** – Implementation Climate Scale **ILS –** Implementation Leadership Scale; **IV**- independent variable; **JS –** Job Satisfaction**; JHNEBPM** – Johns Hopkins Nursing Evidence-Based Practice Model; **LOE** – Level of Evidence; **M** – Mean; **N**- number of participants in study, **n** = number of participants in subset; NA – Nurse administrator; NM **-** Nurse Manager; **NM-EBPC -** Nurse Manager Evidence Based Practice Competency Scale **OCR-SIEP –** Organizational Culture and Readiness Scale for System-Wide Integration of Evidence-Based Practice; **OREBP** – Organizational Readiness for Evidence Based Practice; **Ottawa** – Ottawa Model of Research Use; **PARIHS** – Promoting Action on Research Implementation in Health Services; **SN** – Staff Nurse; VAP – Ventilator associated pneumonia; **YE**- Years of experience

Citation	Theoretical/ Conceptual Framework	Design/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
level of implementation of EBP: The first step to creating an EBP culture **Country:** South Korea **Funding:** Research fund from Chosun University **Bias:** none listed		1. To identify nurses' EBP knowledge, beliefs, organizational readiness, and EBP implementation levels 2. Examine relationship between EBP knowledge beliefs, organizational readiness, and	**BACC** = 65.7% **SN** = 80.1% **Setting** Convenience sample of nurses at large hospital in South Korea **IC –** Clinical RNs, CNSs, NM, NA **EC –** part time RNs, training	**DV2:** EBP beliefs **DV3:** Organizational readiness and **DV4:** EBP implementation.	EBP Implementation tool	Hierarchical multiple regression independent t-tests ANOVA Scheffe Test Effect size of 0.02; significance level of 0.05, and test power of 0.80	76.4/120 **DV4** 15.0/72 EBK, EBPB, OR significantly correlated with EBPI, rated as major predictors	**Limitations -** One hospital, convenience sample; not generalizable, **Conclusion** – Level of OREBP shown to be greatest factor in EBPI.

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Citation	Theoretical/ Conceptual Framework	Design/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
		EBP implementation 3. To Identify the factors that affect EBP implementation	RNs, non-direct patient care RN					

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Appendix B

Synthesis Table

Table A2

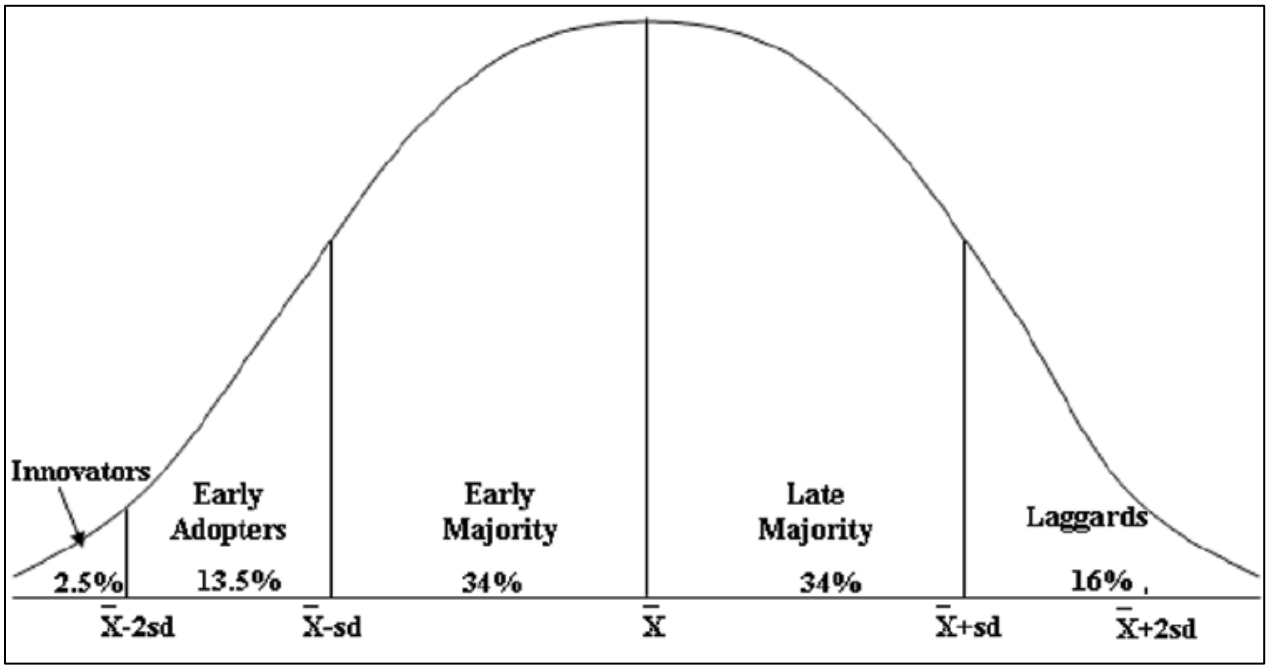
Study (Author, year)	Freisen, 2017	Hasanpoor, 2019	Kim, 2017	Melnyk, 2017	Mudderman, 2020	Pereira, 2018	Spiva, 2017	Shuman, 2018	Warren, 2016	Yoo, 2019
Design LOE	Pretest-Posttest III	Cross-Sectional III	Pretest-Posttest Quasi-experimental III	Pretest-Posttest Longitudinal III	Pretest-Posttest III	Cross-Sectional Descriptive III	2 group Pretest-posttest Quasi-experimental III	Cross-Sectional III	Cross-sectional Survey III	Cross-Sectional III
Sample										
n subjects	57	212	120	45	9	100	433	310	1608	521
mean age	43	41	42	-	-	45	44	39	-	32
% with BACC	67	63	48	-	33	57	63	56	52	66
YE	13	17	16	-		20	18	12	17	9
Country	USA	Iran	USA	USA	USA	Switzerland	USA	USA	USA	S Korea
Setting	Multi-hospital system	Multi-hospital system	Multi-hospital system	Single hospital (341 bed)	Rural CAH (25)	Community Health Center	Multi-hospital system	Multiple Hospitals	Multi-hospital system	Single Hospital
Model	Roger's DOI ARCC Ottawa JHNEBPM	--	ARCC	ARCC	Iowa Model	ARCC	---	PARHIS framework	PARHIS Dillman's	ARCC
Intervention Tools Used										
EBPB	X		X	X		X			X	X

Study (Author, year)	Freisen, 2017	Hasanpoor, 2019	Kim, 2017	Melnyk, 2017	Mudderman, 2020	Pereira, 2018	Spiva, 2017	Shuman, 2018	Warren, 2016	Yoo, 2019
EBPI	X		X	X		X			X	X
OCR-SIEP				X					X	X
EBMgt Q		X								
JS			X							
GR-COH			X							
GR-ATTR			X							
EBPQ					X					
Confidence Scale							X			
Barriers to Research Utilization Scale							X			
EBP Work Environment Scale							X			
EBP Nurse Leadership							X			
NM- EBPC								X		
ILS								X		
ICS								X		
EBP Knowledge Questionnaire										X
Associated with Research/mentoring Program	X		X		X		X			
How long was the program?										
Assessment of Nursing Staff	X	X	X	X	X	X	X	X	X	X
Assessment of Managers		X		X			X	X	X	X

Study (Author, year)	Freisen, 2017	Hasanpoor, 2019	Kim, 2017	Melnyk, 2017	Mudderman, 2020	Pereira, 2018	Spiva, 2017	Shuman, 2018	Warren, 2016	Yoo, 2019

Appendix C

Roger's Diffusion of Innovation Model: Adopter Categories on the Basis of Innovation



Appendix D

The Advancing Research & Clinical practice through close Collaboration Model