

Determinants of an Evidence-Based Practice Environment: An Interpretive Description

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Abstract

Background Despite the available research to inform nursing practice many patients still fail to receive care that is evidence-based. A number of evidence-based practice (EBP) models have been developed to guide nurses through the steps in the process, yet these models have not been uniformly adopted or consistently used. The original purpose of this research was to gather perspectives and experiences of nurses using the Iowa Model of EBP to help inform its introduction into other practice settings. As a deeper understanding was gained the emphasis of the study shifted towards understanding the determinants of the EBP environment. **Method** The study was conducted in a 800 bed comprehensive academic medical centre with a 25 year history of using the Iowa Model of EBP. Semi-structured in-depth interviews were conducted with twelve nurses from various roles to ascertain their perspectives and experiences of using the model. The interview transcripts were reviewed alongside relevant published literature and internal documents in a process of synthesising, theorising, and conceptualising. Data were collected during the first four months of 2019. **Results** The determinants of the local EBP environment were clustered into four themes: 1) The importance of a shared model to guide staff through the EBP process; 2) Support for EBP in the form of education, hands-on training, and knowledge infrastructure; 3) Active team facilitation by direct care nurses, nurse managers, nurses specialists, and nurse scientists; and 4) A culture and leadership that encourages EBP. **Conclusion** Introducing an EBP model is an important first step for an organisation to improve consistent and reliable evidence-based care; to be most effective, this should be done in conjunction with efforts to optimise the EBP environment.

Background

Evidence-based practice (EBP) is considered the gold standard of care, and as such, it is now an expectation of patients, regulatory agencies, and healthcare funders. Despite the abundance of research to inform clinical practice many patients still fail to receive care that is evidence-based. Population level estimates of the quality of health care are limited, but two landmark studies, one from the US [1] and one from Australia [2], estimate adherence to clinical practice guidelines at 55% and 57%, respectively. Thus, almost four out of every 10 people do not get care that has been proven to be effective, or worse still, get care that is known to be ineffective, or even harmful.

There have been many reasons put forward as to why it is so difficult to provide evidence-based care. One of the most obvious is the fact that new evidence is being generated at an ever increasing rate. It is estimated that nearly one million new articles are posted on PubMed annually [3]. Health care professionals, therefore, face the challenge of providing care while also finding, appraising, and integrating new evidence into their routine practice.

A number of models that have been developed to guide nurses through EBP. Most are process models that focus on guiding the nurse through the necessary steps [4]. Although they vary in explicit criteria, they generally all contain a common series of steps from the identification of a clinical problem, to evidence synthesis, and then implementation and evaluation [5]. While many of the models have existed

for two decades or more their use varies considerably among organisations and between countries which has led to a call for more widespread dissemination and adoption [6].

The original aim was to gather the perspectives and experiences of nurses using the Iowa Model of EBP (Iowa Model) [7] to inform its introduction into other practice settings, particularly the lead authors home organisation in Australia. As with many interpretive descriptive studies, the focus of the research departed slightly from its original aim [8]. As a deeper understanding was gained the focus broadened to include all of the determinants of the EBP environment.

Methods

Design

An interpretive descriptive methodology [9] was used to identify themes and patterns within the subjective perspectives and experiences of nurses using the Iowa Model.

Analytic Framework

In interpretive description, qualitative inquiry is located within the existing body of knowledge with findings constructed through thoughtful linkages with other work in the field [10, 11]. This study was informed by current research on EBP and the models, frameworks, and theories that endeavour to explain it [12].

Setting

The setting was an 800 bed comprehensive academic medical centre and level one trauma centre located in Midwestern USA. The four-time-designated Magnet hospital has over 13,000 employees including 3,000 professional nurses who care for 37,000 in-patients, over a million clinic visits and 58,000 emergency department visits annually. The Iowa Model was first developed by local clinicians and nursing faculty 25 years ago.

Participants

An email invitation was sent from the Office of Nursing Research and EBP to nurses with experience using the Iowa Model. Maximum variation sampling [13] was employed to target participants from different nursing roles. The intention was to gather a broad selection of experiences and perspectives. In keeping with the methodology [9], data saturation was not the desired outcome as it was acknowledged that there may be an infinite variation of perspectives and experiences. Instead, the focus was to interview participants until a deep understanding was obtained while recognising that outliers may still exist.

Data Collection

A semi-structured interview schedule was developed which was informed by the literature. A reflective researcher diary documenting observations and experiences was used contemporaneously [14]. Interviews were conducted by the lead author who was embedded in the organisation as part of an academic exchange program. This extended exposure helped the researcher develop insights into the practice setting and build trust and rapport with the participants [15]. The interviews were audio recorded and transcribed verbatim. Documents relevant to the organisations EBP program were reviewed to generate further insights and corroborate the interview data [16]. The documents reviewed included annual reports, accreditation materials, meeting minutes, peer reviewed publications, organisational webpages, and EBP training materials. The published works that inform theme development have been referenced in the appropriate section of the findings.

Data Analysis

Data analysis was an ongoing iterative process conducted throughout data collection [9]. All transcribed interviews were uploaded to NVivo 12 software where they were read in detail several times. This enabled the identification of similarities and differences between participants making it possible to see patterns and generate initial themes. The review of the transcripts was interspersed with strategic periods of immersion in the literature and internal documents as part of the process of synthesising, theorising, and conceptualising [11]. After a preliminary analysis was performed the initial themes and organising framework were discussed with participants and other key stakeholders [8] and their feedback was incorporated into further rounds of synthesising, theorising, and conceptualising [11].

Rigour

To maintain rigour, the practices recommended by Thorne et al [11] were implemented; specifically, prolonged engagement with participants; the use of a reflexive researcher diary; the triangulation of data from multiple sources; and the confirmation of initial themes and organising framework with participants.

Results

A total of twelve in-depth interviews lasting between 60 and 120 minutes were conducted between February and May 2019. Participants including three staff nurses, three nurse faculty, one nurse leader, two nurse scientists, two nurse specialists, and one nurse manager. The three staff nurses had two to eight years' experience using the Iowa Model while the other participants had more than 20 years (see table 1).

Table 1 Characteristics of participants

Participant	Role	Experience with Iowa Model
1	Staff Nurse	2 years
2	Staff Nurse	2 years
3	Staff Nurse	8 years
4	Nurse Faculty	25 years
5	Nurse Faculty	25 years
6	Nurse Faculty	25 years
7	Nurse Scientist	25 years
8	Nurse Scientist	25 years
9	Nurse Leader	25 years
10	Nurse Specialist	20 years
11	Nurse Specialist	25 years
12	Nurse Manager	25 years

As the interviews and analysis progressed it became apparent that a supportive practice environment was the primary influence on nurses' ability to consistently and effectively deliver evidence-based care. Determinants of the EBP environment were clustered into four themes; process, support, facilitation, and context. These themes are represented in Figure 1 and described in detail below.

Process

All participants agreed that having the Iowa Model to guide the EBP process was a key determinant of the EBP environment. More than one interviewee described the model as a *'roadmap'* that staff use to navigate the EBP process.

It [the Iowa Model] is our roadmap for EBP. The model helps us know if you're heading in the right direction, where you're at, where you're going. When you get off course, it helps to pull you back on course. It helps identify some of the hazards and potholes that we can expect, and how to troubleshoot through them. P7

The fact that the model was locally developed was seen as a benefit as it gave staff a sense of ownership and an investment in the EBP process. Participants did acknowledge that the Iowa Model was one of a number of EBP process models that contained very similar steps. *'Having a model, whichever one is used'*, was seen as the important first step in creating an EBP environment.

The Iowa Model was first developed 25 years ago by local nurses and it is still predominantly the domain of nursing in the organisation today. However, it was pointed out that one step of the model is the establishment of an appropriate team to address the practice issue and in almost all cases this involved interdisciplinary collaboration. The fact that EBP is chiefly led by nursing was seen by interviewees as entirely appropriate.

I'm comfortable with EBP primarily being led by nursing, because nursing is at the front line of care. It's good to have one discipline who's leading it [EBP], who really gets the process, can establish the infrastructure, and hardwired it into business as usual. They can then partner with other professions to collaborate. P10

An identified strength of the Iowa Model and a proposed reason for its success is its focus on frontline practice issues that are meaningful to staff and patients. Projects where the topic was identified by frontline staff were found to be more successful than those topics '*imposed*' on staff.

Projects where frontline staff identify the trigger are the ones nurses are really interested in and commit to; compared to the knowledge focused triggers where we [nurse leaders] say what is needed. P4

An enduring theme with all interviewees was the benefit that comes from a direct care nurse leading practice change. The rationale proposed was that, '*bedside care providers are the ones that see the problems and are best placed to understand the ways to fix it*'. This emancipatory bottom-up approach, where staff are encouraged to identify problems and empowered to fix them, was seen as fundamental to practice change in the organisation.

We shouldn't underestimate the power of bottom-up [practice change] and the buy-in and the influence that happens naturally with it. People will do things for their colleagues that they wouldn't be motivated to do if it came from the top down. P8

Another highlighted strength of the model is its requirement for EBP initiatives to align with organisational priorities. This was seen as essential as, '*any practice change that is initiated by frontline staff must be supported by the organisation if it's to be effective and sustainable*'. It was recognised that when an EBP project didn't align with a priority there was a real risk that it would fail, potentially leaving the team disillusioned with the process.

Aligning to organisational priorities is key. You can have the most brilliant idea in the world, but if you can't get it through, then it's meaningless. All that happens is people get frustrated and they won't want to do it [change practice] again. P5

An essential adjunct to the Iowa Model is the implementation guide [17] which helps users select implementation strategies that are appropriate for the stage of change and target group. When asked what the most useful part of the Iowa Model was, more than one participant stated that '*the implementation guide is the most vital piece of the model*'. The tool was developed locally after it was recognised that there was '*very little guidance for staff on how to operationalise the implementation strategies*'. The focus on implementation is acknowledged internally and externally as one of the strongest features of the Iowa Model and a determinant of the local EBP environment.

Support

Within the nursing directorate EBP is seen as '*core business*' which is reflected in its visibility and status within the organisation. The Director of Nursing Research and EBP sits on the nursing and system executive team where she can influence the strategic direction and secure funds and resources necessary for EBP. There was an appreciation by participants that EBP is well supported with human, material, and financial resources. Particular mention was made of the Office of Nursing Research and EBP which provides EBP education and training, supports staff undertaking EBP projects, and promotes EBP within and outside of the organisation.

Having a centralised office is foundational to our EBP work. Our role is to have the EBP vision for the organisation and then provide the building blocks in order for us to get there. P9

Continuous targeted education on EBP is a key feature of the organisation and one of the identified determinants of the EBP environment. Education is scaffolded, with staff gradually introduced to the concepts and methods in greater depth over time. New staff members are introduced to the Iowa Model at orientation; recent graduates are exposed further during their residency [18]; staff nurses attend grand rounds or the annual national EBP conference; new managers receive targeted education during induction; and nurse specialist and leaders attend an intensive three day advanced EBP workshop [19]. This face to face education is supplemented with locally developed printed resource material, online modules, and an EBP textbook [5].

Theoretical education is complemented by an EBP Internship [20] and an EBP Change Champion program which provide experiential hands-on learning. Key features of both programs include training in EBP, dedicated project time, expert mentoring, and nurse manager support. The major difference between the two programs is that the internship topic is chosen by the staff nurse while the change champion topic is chosen by organisational leaders. The staff nurses interviewed particularly valued the sequestered time; while the managers appreciated that the projects were centrally funded so they did not impact the unit staffing budget.

Nursing in the organisation has close academic affiliations with the College of Nursing and partnerships with other University of Iowa colleges. A strong academic partnership was seen by participants as particularly important during the formation of the EBP environment. One interviewee who founded the Iowa Model recalled with appreciation how faculty helped '*span the boundary between academia and practice*'.

They [nurse faculty] were generous with their time, they were comfortable working outside their specialty fields, and they appreciated the value of practice knowledge as much as theoretical knowledge. P5

The academic and practice environments are highly intertwined with cross organisational representation on many committees. The synergy is further strengthened by the flow of students between the two organisations. Many of the hospital staff study at the college; while many of the graduate students undertake EBP projects at the hospital. To ensure EBP projects target organisational priorities the Nursing Research and EBP Committee maintains a list of priority topics and contact resource.

Being a university hospital, the organisation is well equipped with the infrastructure necessary for EBP. The hospital has a large co-located medical library and staff are well supported by a dedicated health librarian who is visible and accessible within the organisation. The Electronic Health Record (EHR) and the support within the organisation to leverage the EHR and digital data was reported as a facilitator of EBP. One participant described the benefit of using existing data in EBP projects.

I always think about what data I get from what already exists, whether it be an ICD-9 code, procurement data, or [EHR] documentation. I don't want a nurse to have to collect that information because that's a waste of their time. P12

The EHR was also seen as a valuable tool for implementing evidence into practice through the use of evidence-based order sets, reminders, practice alerts, nursing documentation, and flow sheets.

Facilitation

A major proportion of the education, training and support for EBP within the organisation is directed towards direct care nursing staff. Having clinicians lead projects was reported to have a number of benefits: Frontline staff are acutely aware of clinical issues and opportunities for improvement; they have a patient centred perspective; they understand workflows; and they have established clinical networks and influence.

To be successful at implementing evidence it was identified that staff nurses need to be surrounded by a supportive team. There is an expectation in the organisation that the nurse manager of an area (i.e., units or clinics) will be an active member of a team to facilitate practice change [21]. As one participant put it, the nurse manager *'makes or breaks an EBP project. If the manager doesn't support it then the project is going nowhere'*. Nurse managers are also charged with maintaining a local climate that supports EBP. Interviewees said that good managers achieved this in a number of ways including sharing an EBP vision for the area; committing to developing their own and their staffs EBP competency; communicating the expectation of EBP; recognising staff for their EBP; and hiring staff that value EBP.

Facilitating EBP is a major component of the nurse specialists' role within the organisation. They act as mentors for clinical staff undertaking projects while supporting managers to promote EBP in their area. As senior staff they are well acquainted with the workings of the organisation which makes them well placed to assist project leads to connect with other departments and navigate the intricate governance process. One nurse specialist put it this way:

So think of us as being there to help them [staff nurses] through the steps of the Iowa model. When they get stuck, they come to us and we help them try to figure it out. P11

The nurse scientist is a role within the organisation that is dedicated to building EBP capacity and supporting staff undertaking EBP projects. Having an EBP expert on-hand provided staff with a sense of security, which was seen as a significant benefit to both novice and experienced nurses alike.

Well, I know that I can always reach out to [Nurse Scientist] and say, 'Hey, I'm thinking about this. Here's what my situation is, here's what the problem is, this is what I'm finding', and she would help walk me through it. P1

Context

The culture within nursing in the organisation is collaborative yet competitive. There is a high degree of staff cooperation and it is common for staff to, *'jump in to help support each other, knowing that this is what it takes to make projects successful'*. The culture of collaboration is accompanied by a healthy dose of rivalry between and within the divisions which was viewed by one participant as a positive driver of EBP.

I think it's our culture that you don't want your division to look bad and have the other divisions in nursing doing things better. You want to make sure that your division is adequately represented and looks good compared to others. P2

Nursing's shared governance framework provides direct care nurses with the opportunity to be part of the decision making process in the organisation [22]. Nursing EBP is overseen by the Nursing Research and EBP Committee which is co-chaired by the Director of the Nursing Research and EBP, and a staff nurse. The shared governance structure facilitates communication and cooperation between the organisations committees and departments which is seen as essential for effective EBP.

I think it [shared governance] is key. It's about nurses being able to drive their own practice and our committee and our shared governance helps support this. You see, our EBP work impacts on the work of other committees, and other departments, so having this process that supports communicate is really beneficial. P8

The organisation as a whole has a strong focus on constant improvement where staff at all levels are given permission to question the status quo. In fact, direct care staff are challenged by senior staff to question work practices and they are rewarded when they do [23]. One nurse recounted:

I challenge my staff to ask themselves, 'why are we doing it this way? Is there a better way to do it?' We are trying to create this environment of, 'could we be better?' The status quo is not enough here. There's always room for improvement. P12

The interviewees acknowledged the relationship between EBP and quality improvement and the need for the two departments to work closely together. A nurse specialist whose role encompasses both described the essential interaction between the two within the organisation.

So, as I see it ... All EBP is quality but not all quality is EBP. In the Iowa Model we have a number of points where the two converge and diverge. At the front end of the model we can have a trigger that might start an EBP project or a quality project depending on the circumstances. As we progress to implementation

we will often use quality methods to implement [and sustain] the change. Once we have implemented the change we might hand off the project to quality for ongoing monitoring. P10

External recognition is highly valued by the organisation and this is seen as a major determinant of the EBP environment. The success of the EBP program has enhanced the organisations reputation which is a great source of pride to staff and leadership. The EBP projects are also key sources of documentation for external benchmarking, accreditation, and award nominations. Many of the interviewees particularly focused on the relationship between Magnet® and the organisations EBP program.

I like to think that if we do it [EBP] for the right reasons Magnet status will come. However, I will say that if we're looking to ask why it's a priority for the organisation then we can link it to Magnet status. There's a desire to have Magnet recognition and so, that makes EBP a priority for the organisation. P7

Leadership support was seen as crucial for establishing and maintaining an EBP environment. A senior staff member described the period when the Iowa Model was first introduced as a '*perfect storm*' of leadership. The hospital and the College of Nursing had leaders who shared a vision and were '*open to the opportunity that evidence-based nursing practice promised*'. It was acknowledged, however, that over the subsequent 25 years '*some leaders hadn't been as strong in terms of research and EBP*' but they had all valued the '*improved clinical outcomes, the reduced costs, the awards and recognition*'. These beneficial outcomes and the internal and external recognition were seen to reflect positively on the nursing leaders, which in turn bolsters support for the EBP program.

Discussion

Having a standardised approach to EBP was recognised by participants as central to reliable evidence-based care. This belief is also widely accepted in the literature [12], yet still it is noted that EBP models are infrequently used, used superficially, or misused [4]. This has led to a call to action for further wide scale adoption and use of EBP models and more research to support them [6]. This research helps answer that call by providing valuable insights into how an organisation might take up, support, and sustain an EBP model.

Given that many of the EBP process models share similar steps, the most important consideration when selecting a model should be its acceptability to users. The Iowa Model was embraced by local staff for its focus on frontline practice issues and alignment to organisational priorities. In the literature, the perception of key stakeholders about whether a change is externally or internally driven is known to influence success [24]. If the decision to adopt is made by leader edict with little user input then implementation is less likely to succeed [25]. There is also evidence that a receptive context where the evidence-based change is congruent to the organisations mission and strategy is more likely to be effective [26].

Introducing an EBP model is an important first step for achieving reliable evidence-based care; however, to be most effective, the findings from this study suggest that it should be done in conjunction with

optimisation of the practice environment. This finding is in keeping with the implementation science literature which has long identified the influence of organisational and contextual factors on EBP. A recent systematic review of 36 studies found similar determinants to EBP as the ones identified in this research, including a supportive culture; effective networks and communication; leadership support; necessary resources; education and training; a focus on data and evaluation; and EBP champions [27]. This research adds to this body of knowledge by providing a rich description of the determinants in one practice setting.

The relationship between outcomes and organisational and contextual factors is well described in the implementation science literature, but there is limited practical guidance on how best to optimise a practice environment for EBP. Currently these factors are best described by determinant frameworks such as the Consolidated Framework for Implementation Research (CFIR) [28], or the Theoretical Domains Framework (TDF) [29] but these do not offer the step by step guidance required by clinicians. There are a number of hybrid process-determinant theories which address implementation along with organisational and contextual factors [30-32]. Organisations seeking to optimise the practice environment for EBP could use one of these hybrid models or pair an EBP process model with the CFIR or TDF.

Experiential programs where participants get the opportunity to acquire practical skills is a key feature of the EBP environment observed in this study. This approach to education aligns with current research on factors that impact nurses' readiness for EBP. An integrative review of 39 studies on the topic found that, regardless of the amount of EBP education received, the most positive predictor of evidence use was a nurses previous participation in EBP activities [33]. Organisations wishing to grow their EBP capacity should therefore consider practical hands-on training that enhances EBP competency [34].

Facilitation – defined as the act of enabling others to implement practice change – would seem to be a central yet almost invisible component of most EBP process models. A team- based facilitation approach was identified as one of the principal determinants of the local EBP environment. Team based facilitation leverages different skill sets and professional networks to enable change at various organisational levels [35]. In this study, for example, the direct care nurses supported by the nurse manager use their insights into practice and influence over staff to shape practice at the micro level (unit level); while the nurse specialists and nurse scientists used their professional networks and knowledge of the organisation to build the mezzo and macro level support necessary to sustain and scale up the practice change.

Strengths and Limitations

Qualitative research is a valuable method for studying EBP because it rejects the notion of a single reality and instead appreciates the existence of multiple possibilities, which are context-bound, experientially based, and constructed through social interaction [11]. This in-depth interpretive study provides a rich description of the determinants of the EBP environment in one practice setting which may benefit others wishing to adopt an EBP model into their organisation.

The focus of this research changed over time which may be seen as a limitation but is in keeping with interpretive description, and indeed all qualitative methods [36]. If a question is worth studying qualitatively, it should be acknowledged that as it is investigated the emphasis of the inquiry may change as a deeper understanding of the phenomena is gained.

Conclusion

The findings from this research support previous studies which found that EBP is most effective in a supportive practice environment. In this setting the determinants of the local EBP environment included a shared EBP model, education, hands-on training, knowledge infrastructure, team facilitation, and a supportive culture and leadership. These findings will be of benefit to organisations and individuals wishing to implement an EBP model to improve the reliability and consistency of evidence-based care.

Abbreviations

EBP - Evidence Based Practice

CFIR - Consolidated Framework for Implementation Research

TDF - Theoretical Domains Framework

Declarations

Ethics approval and consent to participate

Ethical approval for the study was obtained from the University of Iowa Institutional Review Board (201902704) and the University of Newcastle Human Research Ethics Committee (H-2018-0399). All participants provided written, informed consent.

Consent for publication

Not applicable.

Availability of data and materials

The data that support the findings of this study are available on request from the corresponding author [JD]. The data are not publicly available due to it containing information that could compromise participant privacy.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

JD and VS developed the question and conceptual design of the study. JD conducted the interviews and performed initial analysis. LC, KH, VS contributed to the secondary analysis and interpretation of the data. All authors were involved in drafting and revising the manuscript and approved the version published.

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Figures

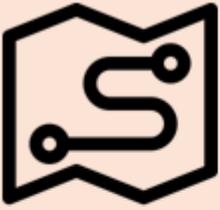
Determinants of an Evidence-Based Practice Environment			
			
Process	Support	Facilitation	Context
<ul style="list-style-type: none"> • Shared EBP model • Nurse led yet interdisciplinary • Focus on frontline practice • Aligned to organisational priorities • Implementation guidance 	<ul style="list-style-type: none"> • EBP as core business • Scaffolded EBP education • Experiential EBP training • Academic partnerships • Knowledge infrastructure 	<ul style="list-style-type: none"> • Direct care nurse leadership • Actively engaged nurse management • Facilitation by nurse specialist • Expert support from nurse scientist 	<ul style="list-style-type: none"> • Collaborative yet competitive • Continuous improvement • Shared governance • External recognition • Leadership support

Figure 1

Determinants of the EBP Environment