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Evidence-informed practice: simplifying and applying the concept for nursing students and academics

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Abstract

Background: Nurses' ability to effectively apply evidence into practice is a critical factor in the delivery of quality patient care. Evidence-Based Practice (EBP) is recognized as the gold standard for the delivery of safe and effective person-centred care. Yet, after several decades of its inception, nurses continue to encounter difficulties in implementing the concept. Existing models for implementing EBP offer stepwise approaches, nevertheless, certain factors, such as the context of care and its mechanistic nature act as barriers to the effective and consistent implementation of EBP. It is, therefore, imperative that a solution to solving the way in which evidence is applied into practice is found. Evidence-Informed Practice (EIP) is an evolving concept. In recent times, there has been a focus on EIP as an alternative to EBP. This has generated an international debate as to which of the two concepts better facilitate the application of evidence into practice. While several EBP models and educational interventions exist, there is limited research directed towards understanding the concept of EIP and how it facilitates the application of evidence into clinical nursing practice.

Aim: This article aims at clarifying the concept of EIP and provides an integrated systems-based model of EIP in facilitating the application of evidence into clinical nursing practice. This is achieved through the application of two nursing case scenarios. Case scenario 1 is about caring for a high-dependent patient and case scenario 2 involves a patient with a low white blood cell count.

Method: this article takes the reader through the various factors, elements, and associated systems and processes of the EIP model.

Results: The case scenarios detail the various factors and elements of the EIP model and defines how it facilitates the application of evidence into clinical nursing practice.

Conclusion: The EIP model provides a framework for nurses (indeed all healthcare practitioners) to deliver clinically effective care, and to be able to defend the processes used and the service provided by referring to reliable evidence.

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Abstract

Background: Nurses' ability to effectively apply evidence into practice is a critical factor in the delivery of quality patient care. Evidence-Based Practice (EBP) is recognized as the gold standard for the delivery of safe and effective person-centred care. Yet, after several decades of its inception, nurses continue to encounter difficulties in implementing the concept. Existing models for implementing EBP offer stepwise approaches, nevertheless, certain factors, such as the context of care and its mechanistic nature act as barriers to the effective and consistent implementation of EBP. It is, therefore, imperative that a solution to solving the way in which evidence is applied into practice is found. Evidence-Informed Practice (EIP) is an evolving concept. In recent times, there has been a focus on EIP as an alternative to EBP. This has generated an international debate as to which of the two concepts better facilitate the application of evidence into practice. While several EBP models and educational interventions exist, there is limited research directed towards understanding the concept of EIP and how it facilitates the application of evidence into clinical nursing practice.

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Keywords

Evidence-informed practice, Professional accountability, Evidence-based practice, Clinical decision-making

Key points:

- ✓ Two main concepts have been associated with the application of evidence into practice: EBP and EIP.
- ✓ The main feature that distinguishes EIP from EBP is the processes used in implementing the concepts
- ✓ EIP is the mechanisms or processes you go through to implement EBP.
- ✓ EIP is not a substitute or replacement for EBP. EIP is an integrated approach to applying evidence into practice, which incorporates the steps of EBP in its processes.

The evidence-based movement: Origin and related concepts.

The evidence-based working group in the United States of America (USA) coined the term 'Evidence-Based Medicine (EBM). Their aim was to shift the focus in clinical decision-making from "intuition, unsystematic clinical experience, and pathophysiologic rational to scientific, clinically relevant research" (Guyatt et al. 1992 p.2420). However, Archibald (Archie) Cochrane is considered the inventor of EBM in the modern era (Stavrou et al. 2014). Archie Cochrane was an eminent physician and epidemiologist who at some point in his career joined the British army and served as a medical officer in prisoner of war camps during the Second World War. His experience during this period in the camp stimulated his belief that much of medicine did not have enough evidence to justify its use (Cochrane 1984).

Cochrane (1972) pointed out the importance of properly testing the effectiveness of healthcare strategies and stressed on the role of Randomised Controlled Trails (RCT) to provide evidence on which healthcare is based. An RCT is a study design that involves the assignment of individual participants in a study to either an intervention or a control group (Higgins and Green 2011). Cochrane's early work was eventually developed by Rosenberg and Donald (1995, p.2). They defined EBM as "the process of systematically finding, appraising and using contemporaneous research findings as the basis for clinical decisions." Building on the works of Cochrane and Rosenberg and Donald, EBM has since evolved to include "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett 1996, p. 76).

The benefits of EBM have been adapted and implemented in other healthcare fields with the use of universal terms including Evidence-Based Practice (EBP), or more

specific terms such as Evidence-Based Nursing (EBN). Central to all these definitions and terms, however, is the fact that they are based primarily on the original principles of EBM (Young et al. 2015).

Evidence-based nursing is specific to the nursing profession. It was first introduced to the literature by Nicky Cullum and colleagues in April 1997 before the launch of the EBN journal in November 1997. Cullum et al. (1997) described what EBN is and is not and how the concept was important in ensuring the best possible nursing outcomes for patients. Mulhall (1998, p. 5) further stated that evidence-based care in nursing "concerns the incorporation of evidence from research, clinical expertise and patient preferences into decisions about the health of individual patients." A myriad of researchers (including Flemming 1998; Dicensor et al. 1998; Ingersoll 2000; Thompson 2003) have offered definitions of the concept and how it impacts healthcare delivery and patients' outcome. Scott and McSherry (2009) conducted a review of the various definitions of EBN, with emphasis on the differences and similarities among these definitions. They concluded that EBN is "an ongoing process by which evidence, nursing theory and the practitioner's clinical expertise are critically evaluated and considered, in conjunction with patient involvement, to provide delivery of optimum nursing care for the individual" (Scott and McSherry 2009, p. 1089). Internationally, organisations such as the International Council of Nurses (ICN 2012), and nursing's professional regulatory bodies including Nursing and Midwifery Councils worldwide (e.g. the United Kingdom NMC code 2015) have incorporated the importance of basing nursing clinical decision-making and action on best evidence for practice. This article will use the universal term EBP

Evidence-based practice was first mentioned in the literature by Muir-Gray (1997). Muir-Gray (1997, p. 97) defined EBP as "an approach to decision-making in which the clinician uses the best available evidence in consultation with the patient to decide upon the option, which suits the patient best." Since its initial definition in 1997, EBP has gained prominence as the gold standard for the delivery of safe and effective healthcare. The concept has since been recommended by several healthcare agencies worldwide (e.g. UK NMC 2015; ICN 2012).

Are existing approaches of evidence-based practice effective?

The purpose of EBP is to standardise care and reduce variations in healthcare practice. Several researchers (including Sackett et al. 1996; 2000; Ubbink et al. 2013; Melnyk et al. 2014; Warren et al. 2016; Melynk 2018) have argued the benefits of implementing EBP into clinical practice: first, the consistent implementation of EBP improves healthcare delivery and the quality of patient care; second, it encourages transparency and produces positive intervention outcomes; third, it facilitates knowledge sharing and collaboration among healthcare professionals, patients, and carers. Lastly, it enhances patient experience as well as job satisfaction among healthcare professionals.

Regardless of its benefits, however, EBP has significant undesirable effects for healthcare delivery and policy. Critics of EBP have questioned its validity (Nevo and Slovin-Nevo 2011; Rubin 2007); what setting, and practice works to support its use (Nutley et al. 2009); its failure to address the complexity of health and healthcare, and the patient's context (Muir Gray 1997); and its mechanistic approach (McNeill 2006; Epstein 2009).

Several models exist for the implementation of EBP. Examples include: Rosswurm and Larrabee's (1999) model; the Iowa model (Titler et al. 2001); collaborative research utilization model (Dufault 2004); the star model of knowledge transformation (Stevens, 2004); DiCenso et al.'s (2005) model; Greenhalgh et al.'s (2005) model; Johns Hopkins Nursing model (Newhouse et al. 2005); and Melnyk et al.'s (2010) model. Although a comprehensive review of these models is beyond the scope of this article, a brief assessment of the models reveals some shared commonalities. The common elements among these models include, asking or selecting a practice question, searching for the best evidence, critically appraising the evidence, applying the evidence, evaluating the outcome(s) of patient care delivery, and disseminating the outcome(s).

Consistent implementation of EBP in healthcare settings requires complex interdependence among factors such as the characteristics of the organisation (including the internal and external healthcare environment, and organisational structures and values), the EBP topic (for example, reduction of hospital-acquired infections), and the attitudes of the individual practitioner towards EBP (Titler and Everett, 2001; Nieva, Murphy and Ridley, 2005; Cullen and Adams, 2012). Consequently, authors such as Titler and Everett (2001) and Cullen and Adams (2012) have suggested strategies for the implementation of EBP, including the use of change advocates in the healthcare organisation who can tackle potential challenges to implementation, and the use of multidisciplinary healthcare professionals as implementation teams to support the practical aspects of integrating innovations into organisational processes aimed at improving the implementation of EBP. Once the EBP change is integrated into the organisational structure, the change is considered as a standard of care (Greenhalgh, Robert and Bate, 2005).

Despite the existence of multiple EBP models, and research on strategies intended to facilitate the application of evidence into practice, nurses continue to struggle to effectively implement EBP (McSherry et al. 2002; Melnyk et al. 2012; Ubbink, Guyatt and Vermeulen (2013); Stevens 2013; Melnyk 2017; Mick 2017). Melnyk et al (2012) conducted a survey with a random sample of 1015 registered nurses practicing in the United States to determine their perception and attitudes towards the implementation of EBP. The authors reported that although participants believed in EBP, they indicated low levels of implementation of the concept into clinical nursing practice. Participants in the study attributed their ineffective implementation of EBP to barriers such as resistant from nurse leaders, managers, and colleagues. Melnyk et al (2012) concluded that educators and nurse leaders must provide nurses opportunities to train in EBP, as well as enhance supportive cultures in order to improve the implementation of EBP among nurses.

Furthermore, Ubbink et al (2013) conducted a systematic review to determine the views of nurses and clinical doctors regarding knowledge, attitudes, skills, barriers, and behaviour towards EBP. The review included thirty-one studies from seventeen countries, with a quarter (8 studies) from North America and one-third (11 studies) from European countries. The results revealed that organisational and individual barriers prevent the uptake of EBP among nurses and (doctors). Organisational barriers include the lack of material and human resources, and lack of support from managers and leaders. Individual barriers include knowledge deficit regarding EBP, time, and workload (Ubbink et al, 2013). Researchers including Majid et al (2011); Khammarnia et al (2015); and Warren et al (2016) have reported similar barriers to the implementation of EBP among nurses.

Indeed, the ineffective implementation of EBP remains a challenge among many healthcare professionals (Akindipe and Guidon, 2008; Schreiber, Downey and Traister, 2009; Thomas, Soroyan, and Dauphinee, 2011; Ubbink et al, 2013; Barends and Briner, 2014; Hitch and Nicola-Richmond, 2017), not just the nursing profession. However, most research works on teaching approaches and implementation of EBP have primarily focused on the nursing and medical professions (Patelarou et al, 2017). This notwithstanding, studies that involved the other healthcare professionals (such as, physiotherapy, occupational therapy, and physical therapy) as participants, have also reported challenges with regards to the implementation of EBP among these professional groups.

For instance, in a study by Schreiber et al (2009) to investigate implementation of EBP among physical therapist following participation in an EBP workshop, it was reported that although participants had a positive attitude towards EBP, they indicated only a modest change in their use of EBP and continued to depend on more traditional methods in decision-making at six-months follow-up. Akindipe and Guidon (2008) reported similar results in a study aimed at examining the attitudes of physiotherapist towards the implementation of EBP. The authors indicated that participants had challenges with the actual implementation of EBP, although they had a positive attitude towards the concept. Besides, the barriers to the successful implementation of EBP identified for nurses are similar for all other healthcare professions. In Baatiema et al's (2017) systematic review aimed at exploring healthcare professionals' (including nurses, medical doctors and allied health professionals) views regarding barriers to EBP, the results revealed lack of organisational and managerial support, limited competence, knowledge and skills, lack of support from peers and colleagues, as well as limited resources to support

the implementation of EBP.

Existing approaches of EBP have been ineffective in facilitating its implementation (McSherry et al, 2002; McSherry, 2007; Nevo and Slovin-Nevo, 2011; Greenhalgh et al, 2014). Some proponents of EBP have proposed ways to improve the low implementation of the concept. In a recent study by Melnyk et al. (2018) to determine EBP competencies (including EBP knowledge, belief, skills and Implementation, among others) among nurses, it was revealed that key deficits exist that threaten patient safety, the quality of healthcare, and overall patient outcomes. Hence, there is the need for healthcare training institutions to include the training of EBP competencies in academic programs to ensure EBP competencies in graduating students (Melnyk et al. 2018). In addition, the authors recommend that health care organisations set competencies in EBP as a standard for all healthcare professionals. Greenhalgh (2013) and Greenhalgh et al. (2014) have also called for a resurgence of the concept, especially concerning the components of EBP associated with involving patients in decision-making, and with expert judgement and experience. Greenhalgh et al. (2014, p. 3) believe it is time to return to implementing "real EBP", where person-centred care is the top-most priority, and healthcare professionals and their patients "are free to make appropriate care decisions that may not match what best evidence seems to suggest". Nevertheless, researchers (including McSherry et al, 2002; McSherry, 2007; Epstein, 2009; Nevo and Slovin-Nevo, 2011) have proposed an alternative, holistic approach to the application of evidence into practice, termed Evidence-Informed Practice (EIP).

Towards Evidence-informed practice

Evidence-informed practice is based on the premise that healthcare practice should,

as a matter of principle be informed by, rather than based on evidence (Nevo and Slovin-Nevo 2011). This implies that other forms of evidence (for example, patient experiences, the nurse's expertise and experiences), not just the scientific evidence, should be considered in the application of evidence into practice. The term 'evidence-informed' first emerged in the scholarly literature few years after the inception of the evidence-based movement. Entwistle et al. (1998) coined the term Evidence-Informed Patient Choice (EIPC), aimed at tackling the practical issues associated with involving patients in healthcare decision-making. Additionally, it was intended to overcome the problems associated with the evidence-based movement of failing to recognize and integrate patient participation and experiences within the definitions.

Evidence-informed patient choice "involves providing people with research-based information about the effectiveness of health care options and promoting their involvement in decisions about their treatment" (Entwistle et al. 1998, p. 317). Evidence-informed patient choice has since been adopted by various disciplines, including nursing (evidence-informed nursing), social work (evidence-informed social work), education (evidence-informed teaching), and management (evidence-informed management). Other terms such as Evidence-Informed Decision Making (EIDM) and Evidence-Informed Policy Making have been used as well. Nevertheless, it is broadly referred to as EIP (Barrat and Hodson 2006; Epstein 2009; Nevo and Slovin-Nevo 2011). Evidence-informed practice is the assimilation of professional judgment and research evidence regarding the efficiency of interventions (McSherry et al, 2002). This definition was further elaborated by Nevo and Slovin-Nevo (2011) as an approach to patient care where:

"Practitioners are encouraged to be knowledgeable about findings coming from all types of studies and to use them in an integrative manner, taking into consideration clinical experience and judgment, clients' preferences and values, and context of the interventions" (p. 18).

Evidence-informed practice has gained momentum in recent times, and it is often used instead of EBP. For example, in Canada, the term has been widely adopted and is used more often in the health and social care fields. This was reflected in a position statement by the Canadian Nurses Association (CNA 2008) and the Canadian Physiotherapy Association (CPA 2017), where healthcare practitioners, including nurses, clinicians, researchers, educators, administrators and policy-makers were encouraged to collaborate with other stakeholders to enhance EIP in order to ensure integration of the healthcare system. In addition, extensive research on the application of evidence into practice (termed knowledge translation) has been conducted in Canada. The term knowledge translation has been adopted by the Canadian Institute of Health Research to signify the use of high-quality research evidence to make informed decisions (Straus et al. 2009). In 2006, Graham and colleagues developed a "knowledge to action" model intended to integrate the creation and application of knowledge. The model acknowledges the nonlinear process of applying evidence into practice, where each stage is influenced by the next stage. Indeed, in a typical clinical setting, the actual process of applying evidence into practice is not linear, as indicated by proponents of EBP, but cyclical and interdependent. Ciliska (2009, p. 7) linked Graham et al.'s (2006) model to the components of EIDM. According to Ciliska (2009), the knowledge to action model "fits with the steps of EIDM".

In the United Kingdom, the term EIP has been extensively adopted in the field of education, with a lot of resources being invested to assess the progress towards an evidence-informed teaching (Coldwell et al, 2017). In addition, an evidence-informed chartered college of teaching has been lunched (Bevins et al, 2011) to ensure evidence-informed teaching and learning.

Although EIP seems desirable, its processes and outcomes are poorly understood, and demands careful review and evaluation (Entwistle 1998; McSherry 2007; Nevo and Slovin-Nevo 2011). Some proponents of EIP (such as Epstein 2009; Epstein 2011; Nevo and Slovin-Nevo 2011; Webber and Carr 2015) have identified significant differences between EBP and EIP and have argued that the term EBP be replaced with the term EIP. However, other researchers (for example, Ciliska, 2009; Gambrill 2010; Cordoso 2017) have used the terms interchangeably. For instance, Ciliska (2009) developed an EIDM module, but referred to the steps of EBP (i.e. Ask, Acquire, Appraise, Integrate, Adapt, Apply, Analyse) as the processes to be followed in implementing EIDM. Ciliska (2009) claimed the term EIDM was adopted to signify that other types of evidence are useful in clinical decision making, and, to attempt to get beyond the criticisms of EBP. This notwithstanding, the author maintained the existing process of implementing EBP. Similarly, in an article by Shlonsky and Mildon, (2014), there appeared to be contradictory statements on EBP and EIP as the authors consistently referred to an EBP approach as EIP. Examples of such include referring to the steps of EBP as "the steps of EIP" (p. 3) and referring to Haynes et al.'s (2002) expanded EBP model as "revised EIP model" (p. 2).

It is important to note that the main feature that distinguishes EIP from EBP is the processes used in implementing the concepts. Whilst EBP provides a step-wise

approach to the application of evidence into practice, EIP offers a more integrated and systems-based approach to the application of evidence into practice, where person-centredness is the focus of care, and the healthcare professional is free to make decisions (that may not always be in agreement with what the 'research evidence' seems to suggest) in consultation with the patient and other members of the multidisciplinary healthcare team. Thus, unlike EBP, EIP is more flexible and "leaves ample room for clinical experience as well as the constructive and imaginative judgements of practitioners and clients who are in constant interaction and dialogue with one another" (Nevo and Slovin-Nevo 2011, p. 1176).

Subsequent versions of EBP (for instance, Titler, Kleiber and Steelman, 2001; Haynes et al. 2002; Melnyk et al. 2010) have attempted to shift focus from just the 'research evidence' to include patient preferences and circumstances, and the clinician's expertise. Moreover, although initial definitions of EBP regarded RCTs as the best evidence for EBP, this has now been expanded to include empirical evidence from other research methods such as qualitative and descriptive research methods, data from case reports and expert opinions (Titler, 2008). Titler (2008) believes that when there is available research evidence, healthcare decisions should be made based on the research evidence in combination with patient values and the healthcare professional's clinical expertise. However, in instances where enough research evidence is not available, decision-making in healthcare should be guided by non-research evidence sources such as expert opinions (Titler et al, 2001). This highlights the fact that research evidence alone is not adequate in making decisions about patient care.

Haynes et al. (2002) addressed some of the limitations of EBP in "a new prescriptive

model for EBP", which recognizes 'patient preferences' rather than the 'health professional's preferences' or the 'research evidence' as the first priority in clinical decision making. This is essentially the tenets of EIP. However, it is not clear, from Haynes et al.'s (2002) model, the stages one has to go through to apply evidence into clinical practice. Evidence-based practice and EIP are two different concepts that integrate to facilitate the effective application of evidence into practice.

Implementing evidence-informed practice into clinical nursing practice: the application of systems thinking using case scenarios

It has been over two decades since EIP emerged in the literature, however, primary research on the concept has been limited. Little is known about the concept of EIP and the methods needed for its effective implementation (Woodbury and Kuhnke, 2014; McSherry, 2007). Consequently, the concept has had a relatively low implementation rate and difficulties still exist in applying evidence into practice.

Over the years, proponents of EIP have focused their attention on arguing and explaining why the term EBP need to be replaced by EIP, instead of defining the actual processes involved in applying EIP. Thus, the concept remains a mirage in healthcare practice. Stakeholders and researchers in healthcare continue to invest in EBP (Tucker 2014), which has proven to be ineffective in applying evidence into practice. We cannot continue to do the same thing and expect different results. There must be a change in the way in which evidence is applied into practice. Indeed, change is difficult and occurs over time. As Allison et al. (2007, p. 1) rightly puts it, "one of the biggest challenges for healthcare practitioners is implementing a new programme or a new practice". The reason for the seeming lack of acceptance of EIP and the resultant low implementation, are primarily due to inadequate

information on strategies that foster efficient and successful implementation of the concept.

An alternative approach to lessen the adverse effect of "policy resistance" (in this case, EBP and EIP by nurses, (indeed, all healthcare professionals) is by viewing the problems in a more holistic way: systems thinking (Senge 1990; McSherry and Warr 2010). The clinical setting in which nurses work is a complex system made up of several interdependent and interrelated parts. Therefore, problems with healthcare delivery and management must be perceived as a consequence of the exchanges among the element of the systems instead of the outcome or malfunctioning of a particular element. Effective implementation of EIP demands an understanding of the various parts of the system that come together to aid the application of evidence into practice. McSherry (2007) established that the application of EIP passes through three stages (i.e. an input, throughput, and an output). The "output" of applying EIP is an evidence-based practitioner: an empowered nurse who is a critical thinker and doer (McSherry 2007).

The evidence-informed practice model
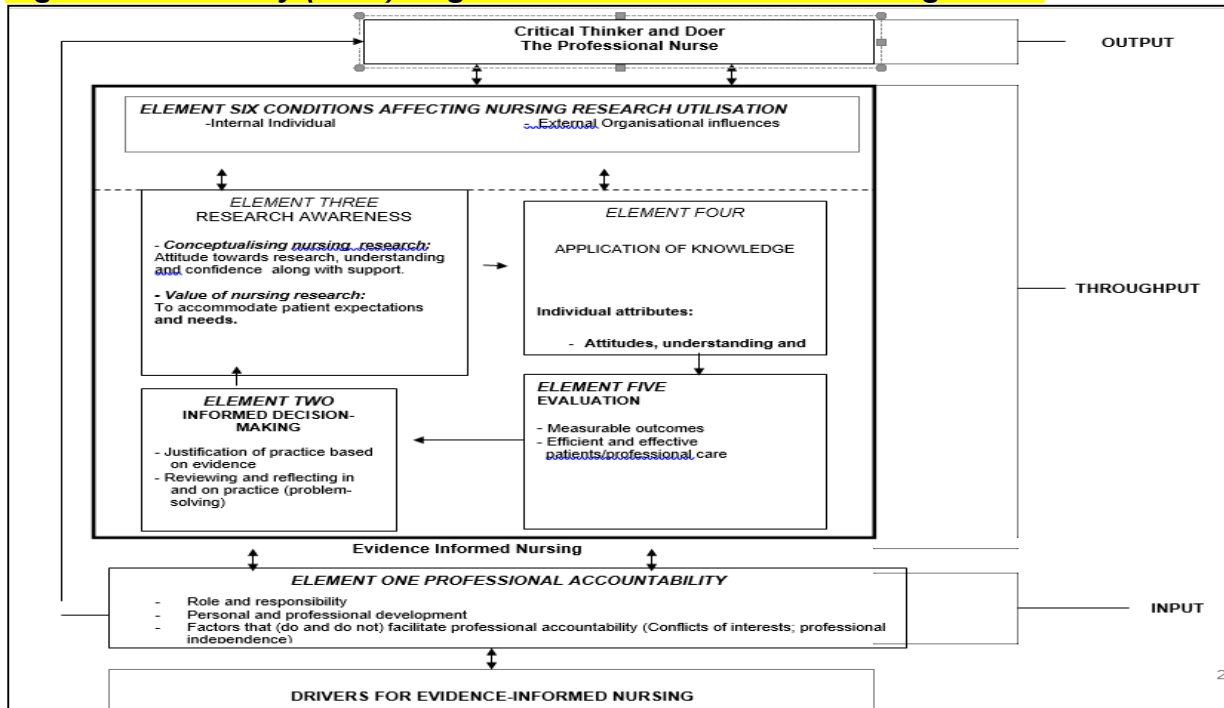
The original model

The original version of McSherry's (2007) model is depicted in Figure 1 below. The model was specifically developed for nurses and was originally named 'the evidence-informed nursing model'. The model presented in Figure 1 was originally developed through a Doctor of Philosophy (PhD) research conducted by Professor Robert McSherry (2007) with the aim to explore, through a mixed-methods study design, why the utilisation of research as evidence in support of clinical nursing practice remains problematic. Study participants were registered nurses practicing in a

hospital trust located in the North-East of England, United Kingdom. Participants were included in the quantitative elements of the study by using a probability sampling technique, where all registered nurses (total of 239) were invited to complete a research awareness questionnaire, of which 149 (response rate of 62%) participants returned a completed questionnaire. The qualitative element involved a purposive sample of 31 nurses of all grades who participated in six focus group discussions. The results showed that to effectively apply evidence into clinical nursing practice, nurses need to be informed of, and be able to interact with, several important elements. The evidence-informed nursing model was developed as an alternative framework for facilitating the application of evidence into clinical nursing practice. The model provides clear lines of accountability by stipulating the systems and processes required to get evidence into practice and by recognising that it is a shared responsibility between the individual and employer in making this happen.

The evidence-informed nursing model (Figure 1) is grounded in the principles and practices of systems thinking. This is because, primarily, the model provided an integrated process to applying evidence into practice, consisting of:

➢ A clearly defined input; to encourage nurses to use evidence in practice

➢ Throughput; facilitation of the processes associated with the elements

➢ Output; improved standards of professional practice

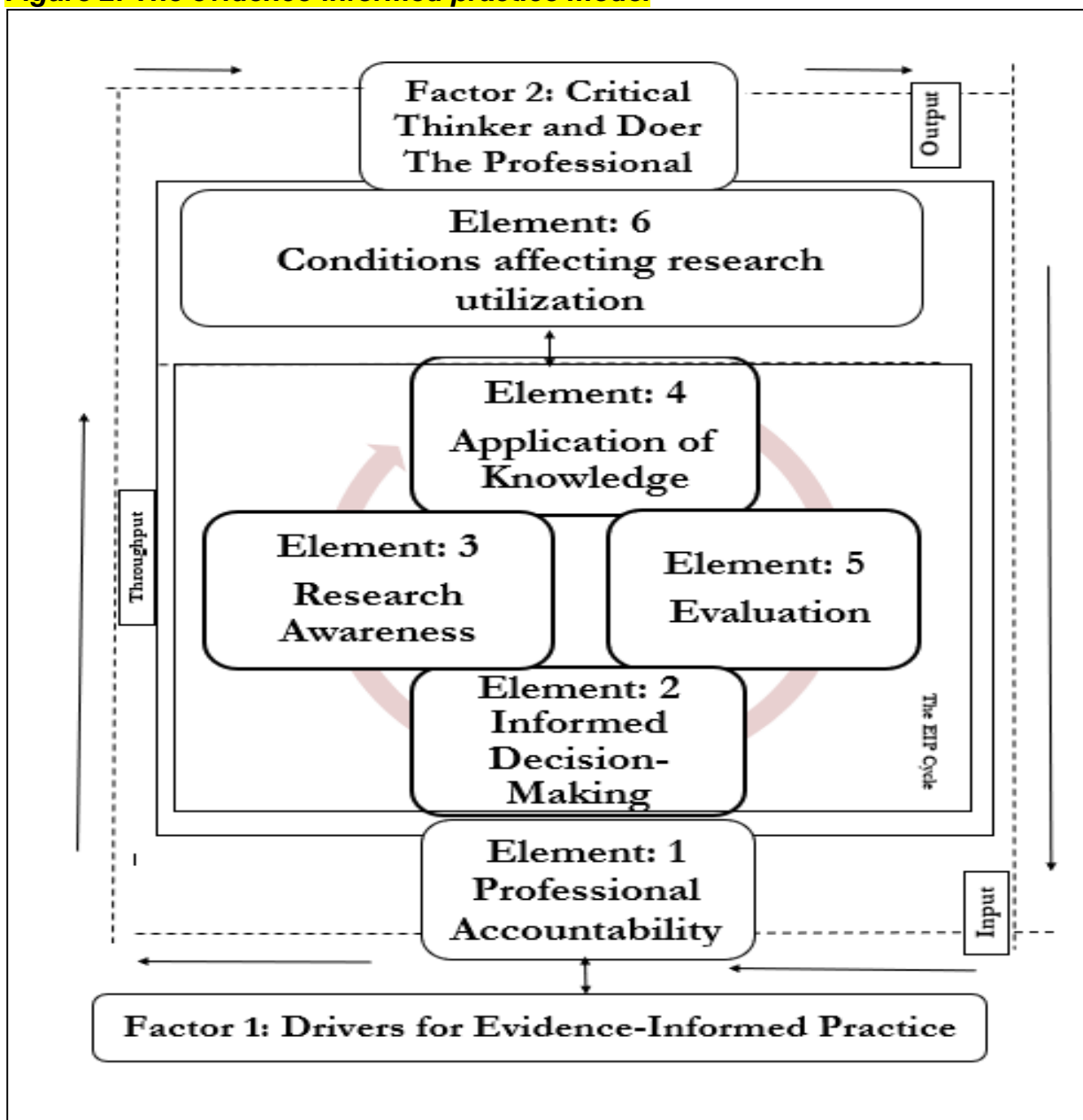**Figure 1: McSherry (2007) original evidence-informed nursing model**

The revised model

The 'evidence-informed nursing model' (McSherry, 2007) has been adapted to 'evidence-informed practice model'. The new 'evidence-informed practice model' (presented in Figure 2 below) is adapted from the original 'evidence-informed nursing model' in several ways. Firstly, the revised model in Figure 2, has been modified to be inclusive of all things evidence-based, which could be applied to any healthcare profession. Secondly, the model has been simplified to show the interconnectedness of the various factors and elements that enable a professional to use evidence in support of their clinical decision-making. Thirdly, the model demonstrates the on-going complexity that healthcare professionals find themselves working in, in the quest to apply evidence into clinical practice. Lastly, the evidence-informed practice model incorporates the various components and activities akin to EBP. The outcome of implementing the evidence-informed practice model is a critical practitioner and doer, who is reflective, responsive, and experienced to

Figure 2: The evidence-informed practice model

explored in more detail in the subsequent sections, by means of two case scenarios. The case scenarios have been used to unpick and apply the evidence-informed practice model to clinical nursing practice in both a scientific and the wider context in which nursing care occurs.

Case Scenarios

Case scenario 1:

Mitchell, aged 58, arrives in the emergency department complaining of severe chest pain. He is diaphoretic (excessive sweating) and says his pain is radiating down his left arm and up into his jaw and adds that he is nauseated. A few minutes after admission, Mitchell suffers a cardiac arrest. He is resuscitated and transferred to the Intensive Care Unit (ICU). He is intubated, is on a ventilator, and has a central-line catheter in place.

Case scenario 2

Yvonne aged 31 is admitted to the Emergency Medical Unit (EMU) following a visit to her General Practitioner (GP) for a non-healing wound to her right big toe. The GP also reported that Yvonne had a recurring sore throat, extreme tiredness, and a low white blood cell count. The GP requested an urgent investigation of these symptoms. Yvonne was placed in a side room for precaution.

The drivers for evidence-informed practice (Factor 1)

Both case scenarios reaffirm the following aligned to getting evidence into practice: in order for nurses to enhance patient care and experiences, along with improving their knowledge and skills of the patient's condition and associated signs and

symptoms, they need to be aware of what EIP is, involves, and the principles required to make it happen. Care plans and associated actions require the nurse to be aware and informed of best evidence, so they can involve the patient in shared decision-making about their care and treatment. Therefore, it is essential that the nurse understands and can identify the key elements that drive the successful implementation of the EIP concept. This is referred to as the drivers for EIP, illustrated in Figure 3 and further elaborated upon in the subsequent sections.

Figure 3: Drivers for Evidence-informed practice (adapted from Allison et al. 2007)
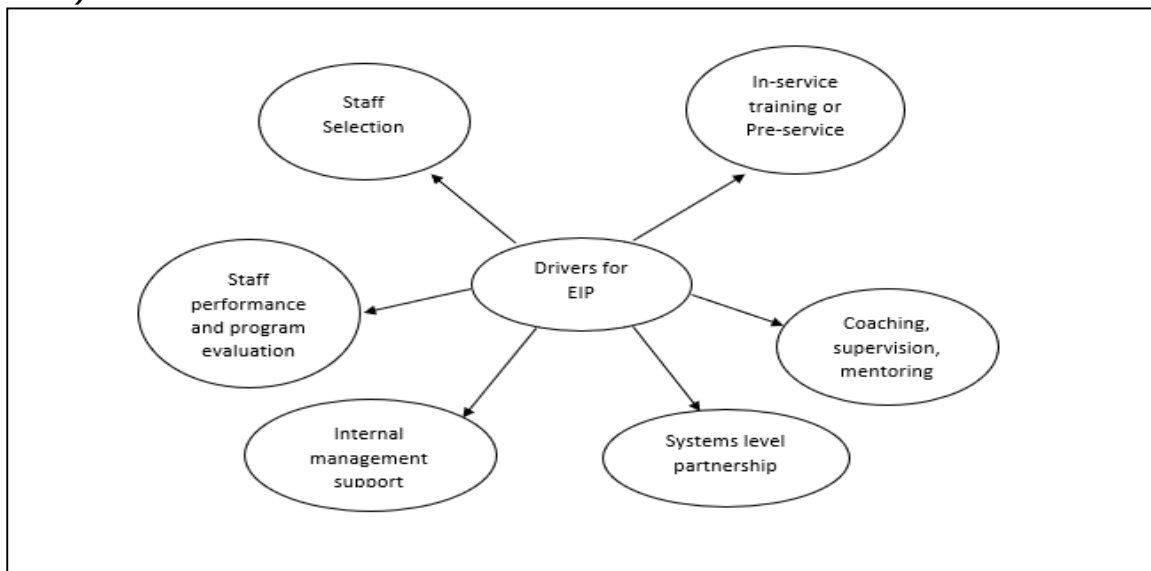
Staff Selection:

Recruiting, interviewing and redeploying existing staff or hiring new staff are part of the staff selection process (Allison et al. 2007; Dill and Shera 2012). The importance of this driver is to identify personnel who qualify to implement the EIP program or model. Additionally, it aims at selecting the organisational members (for example coaches, supervisors, and trainers) who will ensure that the required organisational changes to support nurses in effective implementation of EIP are done.

In-service training or Pre-service

Training on EIP programs or model involves activities that are related to offering instructions, specialised information or skill development in a structured manner to nurses and other key healthcare staff involved in the EIP program. Nurses, as well as other members of staff must learn when, how, where, and with whom to use new approaches and skills in applying evidence into practice (Allison et al. 2007; Dill and Shera 2012).

Coaching, supervision and Mentoring

Coaching and mentoring is a method in which new skills are introduced to nurses on the ward with the help of a coach. The duty of a coach is to offer expertise information together with encouragement, opportunities, and advice to practice and apply skills that are specific to the EIP program. Effective implementation of human service interventions (such as EIP) require change in behaviour at the administrative, supervisory, and practitioner levels (Dill and Shera 2012). Coaching and mentoring are the main ways to bring about a change in behaviour for staffs that were successfully involved in the beginning stage of the implementation process and throughout the life of the EIP program.

Systems-level partnership

Systems-level partnership refers to the improvement of partnerships with the broader and immediate systems to ensure accessibility of required funds, institutional and human resources that are needed to encourage nurses' work. The immediate system partnership refers to individuals or organisations that directly influence healthcare delivery (for example, nurses and doctors). However, partnerships within the broader system refers to policy makers, funders, or other organisations that may support the EIP program, but are not directly involved in healthcare delivery. Various

activities may be conducted in the development of systems-level partnership to aid in implementation of EIP. These may include fundraising activities to help the implementation of EIP programs, as well as the use of external coaches and consultants to assist with on-going mentoring, technical assistance and training.

Internal management support

Internal management support involves activities that are associated with establishing processes and structures within an EIP program that enhance effective implementation of the program. Internal managerial activities that aid implementation of EIP will offer leadership and make use of a variety of data inputs. This is necessary in order to inform healthcare decision-making as well as keep staff organised and focussed on desired care outcomes (Fixsen et al. 2005). Instances of internal management support include the formation of institutional structures and processes, the allocation of resources to support selection of suitable staff, and administrative support for efficient training.

Staff performance and program evaluation

Staff assessment is intended to evaluate the application and results of the skills that are mirrored in the staff selection criteria, learnt during in-service training, and expanded and reinforced during coaching processes (Allison et al. 2007; Dill and Shera 2012). In addition, evaluation is designed to offer trainers, coaches, interviewers and managers insight about the improvement of implementation efforts and the effectiveness of selection, training and coaching.

Input: Professional Accountability (Element 1)

The first element of the EIP model is professional accountability, depicted as an

"input". Professional accountability is an essential part of a nurse's roles and responsibilities, and is reaffirmed in their code of professional practice, contract of employment and job description. In both case scenarios involving Mitchell and Yvonne, professional accountability is evident on several fronts: the nurse must establish a caring, compassionate and therapeutic relationship with the patients by involving and engaging them in shared decision-making regarding all aspects of their care, treatments, and interventions; the nurse is accountable and answerable to the patient and his or her professional colleagues throughout the patient's journey. In addition, the nurse must be well-informed about the patients' clinical presentations (e.g. the signs, symptoms and causes of cardiac arrest and/or anaemia, infection prevention and treatments) and is expected to engage in the care planning processes (that is, Assess, Diagnose, Plan, Implement, and Evaluate). This is imperative in order to ensure that patient care plans and decisions are based on information gathered from the patient and in accordance with his/her professional knowledge. The nurse is accountable and should take responsibilities for his/her actions, judgements and omissions in order to uphold both the standards of the nursing profession and improved patient care outcomes.

Throughput/Process (The evidence-informed practice cycle)

The EIP cycle (located in the 'throughput' of Figure 2) involves the processes or methods through which the nurse applies evidence in support of their decision-making in clinical nursing practice. This often occurs in a clinical nursing environment that is complex, constantly changing, and involves numerous members of the multidisciplinary team and patients and family. Effective communication (both verbal and written) is essential for ensuring that the various elements are interchanging and

communicating between and with each other. For example, in case scenario 2, it is important to explain to Yvonne and her family the reason for nursing Yvonne in a side room instead of the main ward. In this situation, avoiding and preventing cross-infection is essential to safeguard Yvonne from harm.

A common factor for the EIP cycle to happen effectively is that the nurse (the healthcare professional) is the conduit in the interplay between the elements (i.e. element 2: informed decision-making; element 3: research awareness; element 4: application of knowledge; and element 5: evaluation). With regards to both case scenarios, the nurse needs to have sufficient evidence and understanding to inform and engage with their patients about their care and treatments, and where they constantly communicate information between the professionals, the patient, and care environment. The EIP cycle reflects this interchangeableness of the caring environment and its recurring manner by going through the following processes:

Informed decision-making (**Element 2**): this involves a two-way communication between the nurse and patient(s), and is critical in ensuring robust relationship (honesty, openness, transparency) founded on the principles of person-centred care (McSherry and Warr, 2010). It reaffirms the ethical principle of a patient's right to make an informed decision of what is suitable for them, considering their beliefs, values, priorities, and personal circumstances. In case scenario 1, the critical care nurse is expected to involve patient relatives, medical staff and other members of the healthcare team in making decisions about, for example, ventilator management and care of the central line catheter. However, decision-making in an ICU can be complex, and some of the decisions may involve the nurse only (Maharmeh et al. 2016). Similarly, in case scenario 2, the nurse needs to communicate with the

patient, carers, and colleagues about the importance of hand hygiene, wound care, and avoiding hospital-acquired infections when caring for the patient. In both case scenarios, the nurse must endeavour to involve the patient/family members in the process by providing them with timely, appropriate and relevant information needed to make often complex and life changing decisions. Moreover, the nurse is responsible for ensuring the patients' safety, quality experience and optimal recovery, and where necessary, a peaceful death. Protecting privacy, dignity, and respecting one's rights are all part of the nurse's role and responsibility in these contexts.

Research Awareness (Element 3): it involves motivating practitioners to acquire skills and knowledge, and to conceptualize what research and evidence involves and their significance in improving standards of healthcare practice (McSherry et al. 2006). Research awareness is reliant on the nurse's attitudes towards research, knowledge and confidence about research, and on supportive managers and colleagues.

This element of the EIP cycle contained in the model, incorporates three of the existing steps of EBP (i.e. to ask a question, search the literature for research evidence to answer the question, and to critically appraise the evidence obtained). Although the nurse is not required to be a researcher to effectively implement the EIP model, he/she must be knowledgeable about relevant search engines and databases (e.g. Google, Medline) as well as critical appraisal tools in order to include high-quality research evidence in patient care decisions. Nevertheless, the EIP model acknowledges the fact that research evidence may not always be readily available, and nurses may not have the needed software and hardware in the care

environment (Thompson 2003) to search for research evidence. Hence, in support of Greenhalgh et al. (2014), the EIP model recognises nurses as critical thinkers and doers, and therefore, allows them to make appropriate care decisions based on patient preferences and actions, the clinical state, clinical setting and circumstances, and the nurse's knowledge, expertise and clinical experiences, which may not necessarily match what the research evidence seems to suggest.

Using case scenario 1 (similarly for case scenario 2), the nurse updates his/her knowledge on Mitchell's clinical presentation. The nurse searches Medline for research evidence on 'chest pain', and 'cardiac arrest' and its associated symptoms. Based on the number of articles obtained, the nurse reads the titles and abstracts, and then, the full text of selected articles to exclude irrelevant articles. The remaining articles are then critically appraised to include the best research evidence in patient care decisions. In situations where this is not possible, the nurse is encouraged to make the best care decisions based on patient preferences, clinical state, context and circumstances, and the nurse's expertise and experiences as well as the patient and family members where possible.

Application of knowledge (Element 4): this is a very complex element that requires the gathering and assimilation of various sources of information, evidence, quality and standards, and policy and guidance in supporting the nurse's decision-making in clinical nursing practice. In relation to both case scenarios, the nurse should apply knowledge acquired from Mitchell and Yvonne along with their relatives, evidence from reviewing the findings from research, information gleaned from engaging with the multidisciplinary care team, and ensuring they follow recommended guidance and policy. Element 4 is about ensuring that the nurse is experienced,

knowledgeable, and competent to make the most appropriate care decisions with the patient, family and the wider multidisciplinary care team. For the nurse to effectively do this, he/she requires certain institutional and personal characteristics. Institutional features include culture, education and training, and workload/skill mix, while as personal characteristics include improved confidence, attitude, understanding and behaviour towards the application of evidence into practice.

Evaluation (Element 5): this element of the EIP cycle within the model measures the effect of decision-making and actions of the nurse on patient care outcomes and in creating the optimal care environment. In both case scenarios, the nurse should periodically evaluate specific processes and outcomes, for example, with regards to Mitchell, monitoring how Mitchell is performing on the ventilator, taking the necessary infection prevention precautions to avoid the development of infections related to insertion of central line, transmission of nosocomial infections (hospital-acquired infection), as well as improvement in Mitchell's general wellbeing. Depending on the outcome of the evaluation, Mitchell's care plan is either revised or continued. With regard to Yvonne, the issues pertaining to avoiding hospital-acquired infection is similar to that of Mitchell. In both case scenarios, giving and receiving information about the efficacy of the nurse's care, intervention, and evaluation are of equal importance in demonstrating the effectiveness of specific aspects of the nursing process in optimising patient recovery and wellbeing.

Conditions affecting research utilisation (Element 6): research utilisation involves critically appraising research findings, disseminating, and using the knowledge obtained from research to cause changes in an existing healthcare practice (Titler, Kleiber and Steelman, 1994). The conditions that affect research

utilisation have been grouped into five domains, including: the process involved in utilising research findings; accessibility to research; the quality of research; the knowledge and attitudes of the nurse (healthcare professional) regarding the use of research findings; and the organisation into which the findings of research are to be implemented (Wang et al, 2013; Hunt, 1997). In both case scenarios, the nurse must be aware of these potential barriers to research utilisation and to identify ways to overcome the barriers in order to effectively apply evidence into healthcare practice. In addition, the clinical environment in which nurses work must be supportive enough to enhance the effective and consistent application of evidence into practice. Nurses must be supported to acquire the necessary knowledge, skills, and understanding needed to practice safely (i.e. competently and confidently). Besides, resources such as computers and software needed to obtain research evidence must be readily available in the clinical setting for easy access to information.

Output: critical thinker and doer, the professional nurse (Factor 2)

To ensure the nurse informs their decision with the best available evidence, it is imperative that they have a sound understanding and knowledge of what constitutes the EIP model. By successfully engaging with the various factors and elements of the EIP model, the outcome is that of a critical thinker and doer, a professional nurse, who is, as argued by Brechin (2000), "knowledgeable and skilled, yet welcomes alternative ideas and belief systems, appreciating and respecting alternative views" (p. 44). In this context, it is about creating a caring and compassionate environment in which excellence in nursing practice occurs. This can only be exemplified by ensuring that decisions and actions are based on the best available evidence. These characteristics and attributes facilitated within the EIP

model encapsulates the whole ethos of professionalism.

The benefits of the EIP model for the nurse, patient, and family is that, it simplifies a highly complex series of systems and processes pertaining to how evidence is used to support decisions made in clinical nursing practice. The EIP model simply illustrates the why, the how, and the sequencing of getting evidence into clinical nursing practice. It also complements the evidence-based movement by offering the holistic systems-based approach to facilitating the application of evidence into clinical nursing practice. The EIP model is the first model to incorporate and synthesise the various factors and elements into one framework instead of looking at these individually and discretely.

Conclusion

Evidence-informed practice is a holistic integrated approach to applying evidence into practice, which incorporates the steps of EBP within its system and processes. In other words, EBP is a subset of the EIP model, made explicit within the EIP cycle. Thus, EIP is neither an alternative to nor a replacement for EBP. The EIP model provides a framework for nurses (indeed all healthcare practitioners) to deliver clinically effective care and to be able to defend the processes used and the service provided by referring to reliable evidence (McSherry, 2007; McSherry et al, 2002). Both case scenarios demonstrate how the EIP model can be applied to clinical nursing practice. Future initiatives should focus on developing EIP educational interventions and determining the effects of such interventions on healthcare students' knowledge of and attitudes towards the application of evidence into practice.

Reflective Questions

Now that you have completed the article, you might want to make a reflective note by providing answers to the following questions:

1. Make a list of the challenges you encounter in implementing EBP

2. Use the same list and indicate how these challenges prevent you from using evidence to support your nursing clinical decisions and actions in practice

3. How does viewing health and healthcare delivery as a complex system impacts on your patient care?

4. Make a list of the drivers that are encouraging you to support your clinical nursing decisions and actions with evidence.

5. Using your own experience to date and the information presented in the text, make a list of why and how you think evidence-informed practice forms part of your professional accountability and professional registration.

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Figures

Figure 1: McSherry (2007) original evidence-informed nursing model
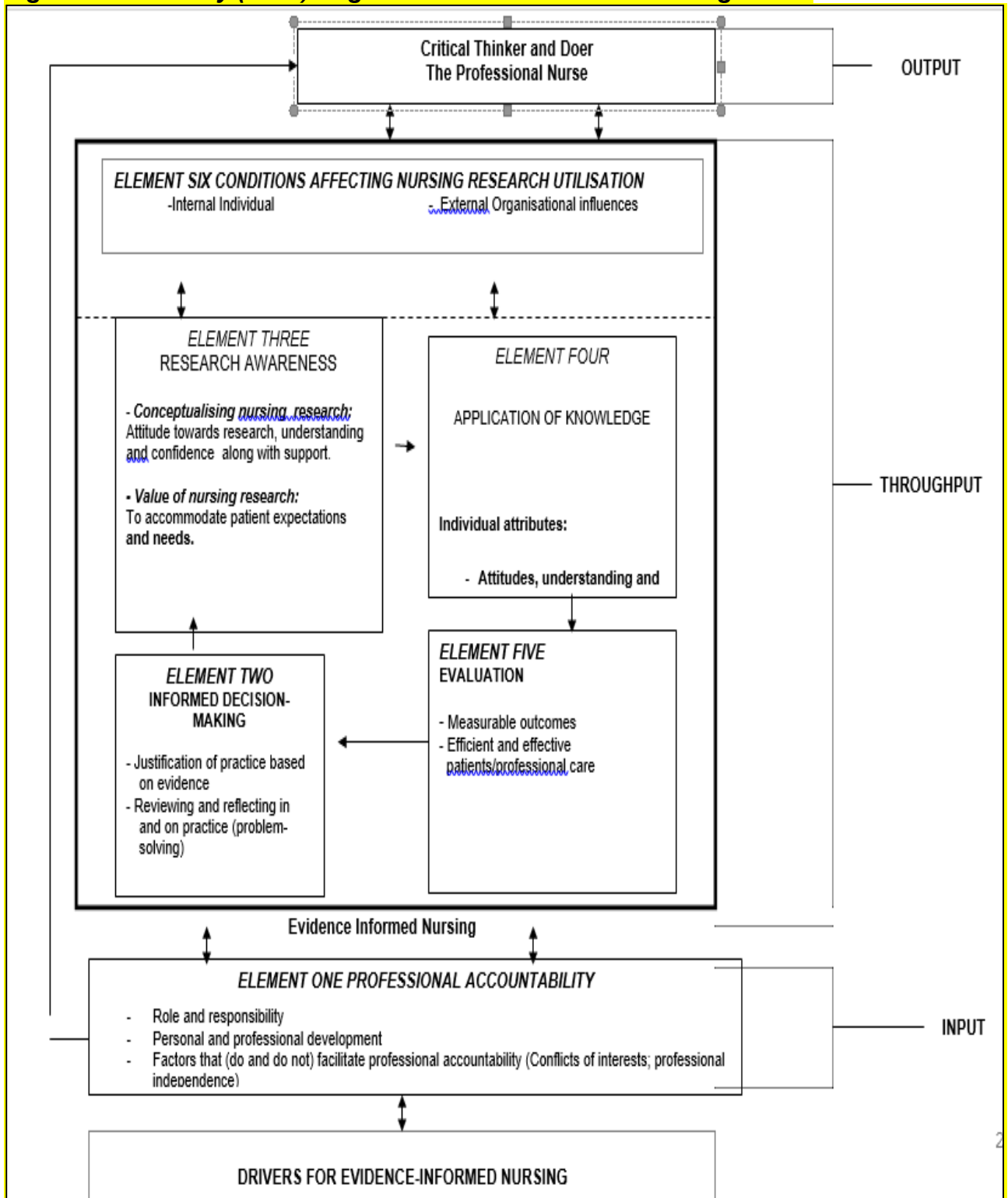
Figure 2: The evidence-informed practice model
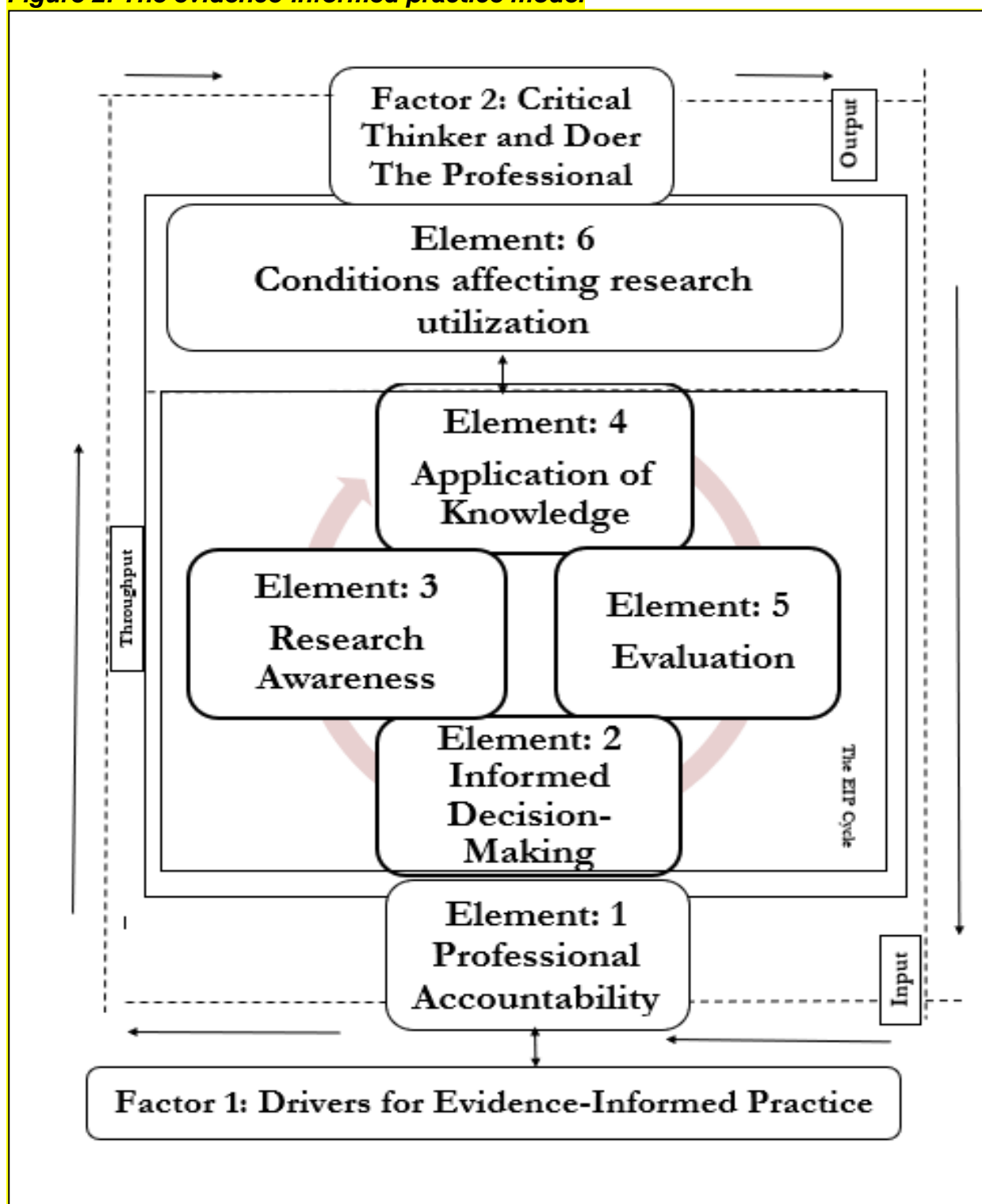
_Figure 3__: Drivers for Evidence-informed practice (adapted from Allison, Blasé and Bowie, 2007)_
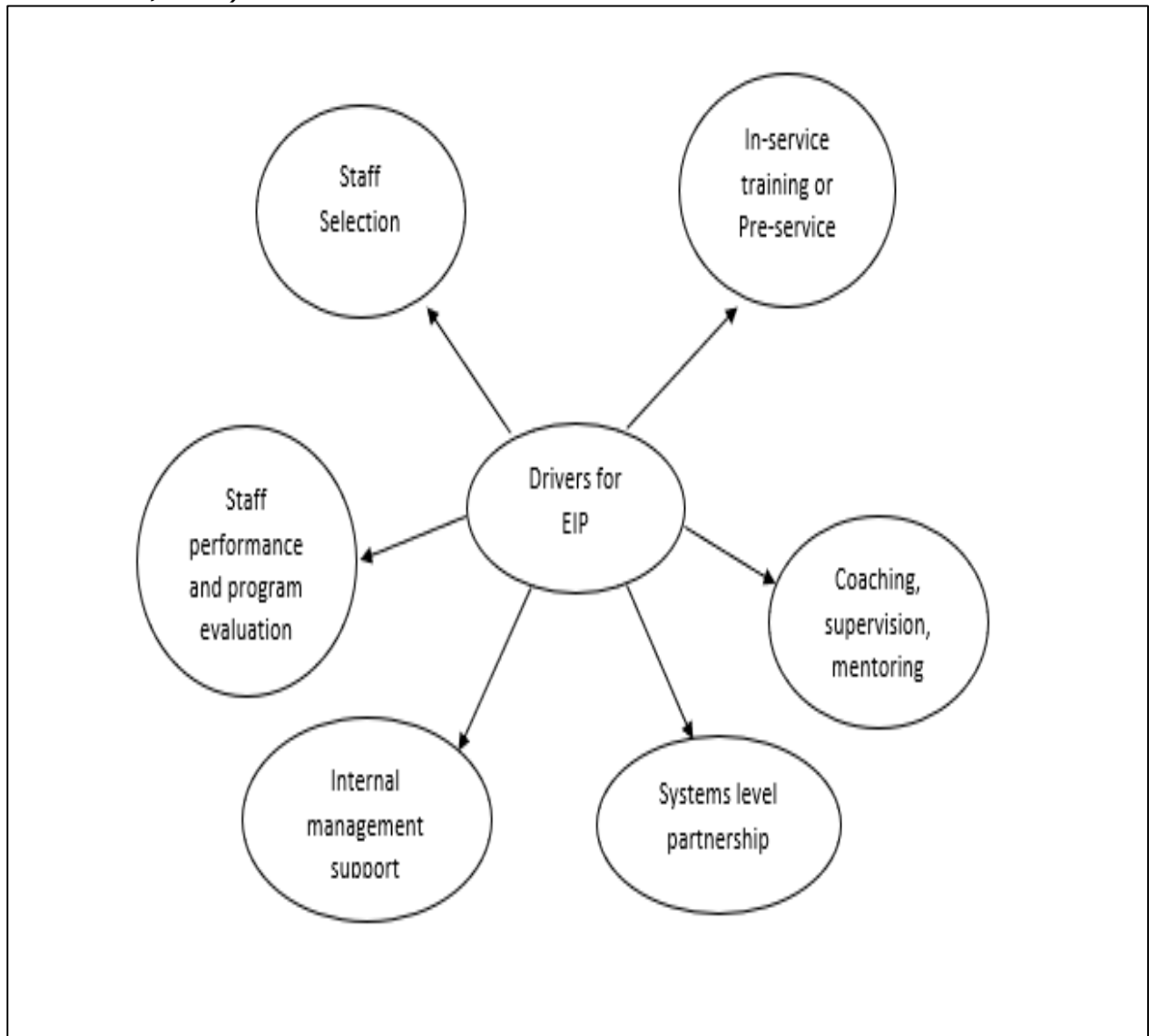
Dear Editor,

RE: BJN Manuscript Number: bjon.2018.0335

Thank you and the reviewers for their constructive feedback and in affording us the opportunity to enhance the quality of our article for readers of the journal. Please find below a summary table of our response to the reviewers' comments. Our responses to the comments have been highlighted in yellow in the article.

We hope you and the reviewers feel that we have improved the quality of the article for publication in the journal. We will be happy to make any further revisions if required.

Yours Sincerely,
Elizabeth

Summary of response to reviewers' comments

Reviewers' comments	Proposed Revision	Authors Revision Response	Page Location in the Text
Reviewer #1	1. The last section of the article with regards reference to McSherry's (2007) evidence-informed nursing model – to provide clarity for readers, it would help if this model was presented in the article to see the difference with the new model proposed or for McSherry's model to have been summarised and explained.	The original McSherry's (2007) 'evidence-informed nursing model' has been presented in the article alongside the new 'evidence-informed practice model'. A description of the differences between the original evidence-informed nursing model and the new evidence-informed practice model has also been provided in the article.	Pages 15-19
	2. The use of a case scenario to explain a revised model is good, but this does not follow through, as Element 6 is not discussed in the context of the scenario or made explicit to show how to follow the model through.	We have included an additional case scenario in order to unpick and apply the evidence-informed practice model to clinical nursing practice in both a scientific and the wider context in which nursing care occurs. The case scenarios have been applied to all the elements (including element 6) and factors of the evidence-informed practice model.	Pages 19-29
	3.	We have included an additional case scenario in order to unpick and apply the evidence-informed	Pages 19-29

	The author may want to reconsider the example case study presented to show wider application of the other forms of evidence identified earlier in the article, such as patient experiences, the nurse's expertise and experiences, and not just the science - this is to give more clarity to the application of EIP.	practice model to clinical nursing practice in both a scientific and the wider context in which nursing care occurs. This includes, to a large extent, the integration of all forms of evidence (such as patient's values and experiences, the nurse's expertise and experiences, and the involvement of other members of the multidisciplinary healthcare team) into clinical decision making	
Reviewer #2	A potentially interesting article that could be improved by judicious editing and a more focused approach. It would also be helped by being less descriptive and providing more analysis of the reasons for poor adoption of EBP in nursing and comparisons with other professions. Is this a failure of the profession, or is it the system that prevents EBP?	The article has been revised to provide critical analysis of the reasons for the poor implementation of evidence-based practice among nurses. We have also provided examples of studies that report that the poor adoption of evidence-based practice spans across the various healthcare professions, not just the nursing profession.	Pages 6-8
	1. The abstract could be clearer and have more structured format.	The abstract has been revised to a more structured format.	Pages 1 and 2.

	2. The key words include "professional accountability", but this is not really expanded on in the article.	The keyword 'professional accountability' has been elaborated on in the article.	Pages 22-23
	3. The background on EBP is quite simplistic and the drivers for its adoption could have been examined and then linked to similarities/differences to nursing and other clinical staff.	The background on evidence-based practice has been expounded to include the drivers/strategies for the adoption of evidence-based practice among healthcare professionals. The literature reveals that strategies for the adoption or implementation of evidence-based practice is the same across the professional disciplines.	Pages 6-8
	4. Check the manuscript for grammatical and typographical errors.	The manuscript has been proofread and checked for typographical and grammatical errors.	
	5. The RCT is central to EBP, but it has also been expanded to include other forms of evidence and methodologies – no mention of this is made beyond incorporating patient preferences/nursing experience.	The article has been revised to highlight the inclusion of other forms of evidence and methodologies, as evidence for EBP.	Page 13

	6. What exactly are the benefits of EBP, EBN and EIP? From whose perspective? Patient, clinician, provider?	The article has been revised. The section titled "are existing approaches of evidence-based practice effective?" has been expounded to include the benefits of EBP. However, it is important to note that the terms EBP and EBN are the same as indicated in the article. The term 'EBP' is used mainly in the article to denote the universal use of the term 'evidence-based'.	Page 5
	7. Nursing outcomes and patient outcomes might not be the same. It may be that the authors should take a patient-centred approach as their starting position and focus.	The article has been revised. We have taken a person-centred approach in applying the case scenarios through the use of the EIP model.	This can be found all through the article. The application of the case scenarios using the EIP model can be found on Pages 19-29

	8. The ICN is not a regulatory body.	The statement has been revised to "Internationally, organisations such as the International Council of Nurses (ICN 2012), and nursing's professional regulatory bodies including Nursing and Midwifery Councils worldwide (e.g. the United Kingdom NMC code 2015) have incorporated the importance of basing nursing clinical decision-making and action on best evidence for practice"	Page 4
	9. The background on the history of EBP is disjointed and repetitive.	The background on the history of EBP has been revised	Pages 4-9
	10. The section asks: "Are existing approaches of EBP effective?", but the reader is left wondering. A more focused and defined proposition would help to answer that question. There is some limited evidence to support reduced costs and improved patient outcomes. However, none of this is outlined or discussed.	The section "are existing approaches of EBP effective" has been revised. We have provided some evidence that report that existing approaches of EBP are ineffective in facilitating the implementation of the concept. In addition, we have provided evidence in support of the benefits of EBP (including improved patient outcomes and reduced costs).	Pages 5-8

	11. Why do nurses struggle to implement EBP? How does this compare? Is it knowledge, time, power? Again, there is a body of literature that has explored this, but this is not mentioned.	The article has been revised to include the barriers to the implementation of EBP among nurses; we have provided some evidence on the reasons for the low uptake of EBP among nurses (and other healthcare professionals).	Pages 7-9
	12. The suggestion that 20 years of teaching nurses about EBP is not sufficient for its integration would seem a little simplistic.	The statement has been deleted.	
	13. Does the name impact on how evidence is used? What are the implications/reasons etc for moving from EBP to EIP or even EBN? A more detailed examination would help the reader.	As stated previously, the terms EBP and EBN are the same in terms of definitions, principles, and approaches to their implementation. However, the term EIP is distinct from EBP (or EBN). As indicated in pages 12 and 13 of the article, the main feature that distinguishes EIP from EBP (or EBN) is the processes used in implementing the concepts. Whiles EBP (or EBN) provides a step-wise approach to the application of evidence into practice, EIP provides a	Pages 12-13

		more integrated and systems-based approach to the application of evidence into practice, where person-centredness is the focus of care, and the healthcare professional is free to make decisions (that may not always be in agreement with what the 'research evidence' seems to suggest) in consultation with the patient and other members of the multidisciplinary healthcare team.	
	14. The above is an example of the descriptive, rather than analytical or explanatory approach, that lets the article down in places.		
	15. Provide a reference to support the assertion that little is known about methods needed for effective implementation of EIP. This is needed to refute the fact that there does seem to be a body of literature that has described barriers to the implementation of EBP	Two references have been provided in the text: Woodbury and Kuhnke, 2014; and McSherry, 2007	Page 14

	16. An unpublished thesis (McSherry 2007) would seem to need more of an introduction and justification as a model of the drivers for EIP. What are other drivers for EIP? How do patient preferences, power structures, costs etc impact on or influence this?	The article has been revised to include a justification and a description for the EIP model, which was developed through a PhD research project conducted by Professor McSherry (2007) involving registered nurses. Please refer to the text for details.	Pages 15-18
	17. How do personnel "qualify" to implement EIP?	The EIP model is applicable to all healthcare professions, not just the nursing profession. In implementing the EIP model, a health professional is not required to be a researcher. However, he/she is expected to have sufficient knowledge regarding relevant databases, as well as knowledge and expertise regarding patients' clinical presentations and conditions. In addition, the health professional must be able to work with the other members of the multi-disciplinary healthcare team, and act in accordance with his/her professional standards, roles, responsibilities. This can be found under the section	Pages 25-28

		"Research Awareness (Element 3), located on pages 25-26.	
	18. The case scenario does not seem to be the best one to clearly explain EIP. It may be that including another, which clearly delineates or makes explicit the nursing roles, might help.	We have included an additional case scenario in order to unpick and apply the evidence-informed practice model to clinical nursing practice in both a scientific and the wider context in which nursing care occurs. This includes, to a large extent, the integration of all forms of evidence (such as patient's values and experiences, the nurse's expertise and experiences, and the involvement of other members of the multidisciplinary healthcare team) into clinical decision making	Pages 19-29

Title Page

Title: Evidence-Informed Practice: Simplifying and applying the concept for nursing students and academics.

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Abstract

Nurses ability to effectively apply evidence into practice is a critical factor in the delivery of quality patient care. Evidence-Based Practice (EBP) is recognized as the gold standard for the delivery of safe and effective person-centred care. Yet, after several decades of its inception, nurses continue to encounter difficulties in implementing the concept. Existing models for implementing EBP offer stepwise approaches, nevertheless, certain factors, such as the context of care and its mechanistic nature act as barriers to the effective and consistent implementation of EBP. It is, therefore, imperative that a solution to solving the way in which evidence is applied into practice is found. Evidence-Informed Practice (EIP) is an evolving concept. In recent times, there has been a focus on EIP as an alternative to EBP. This has generated an international debate as to which of the two concepts better facilitate the application of evidence into practice. While several EBP models and educational interventions exist, little is known about the concept of EIP and how it facilitates the application of evidence into practice. This article aims at clarifying the concept of EIP and describes how it facilitates the application of evidence into practice. In addition, the article introduces an integrated model of EIP, which is grounded in a systems theory.

Evidence-Informed Practice: Simplifying and applying the concept for nursing students and academics

Abstract

Nurses ability to effectively apply evidence into practice is a critical factor in the delivery of quality patient care. Evidence-Based Practice (EBP) is recognized as the gold standard for the delivery of safe and effective person-centred care. Yet, after several decades of its inception, nurses continue to encounter difficulties in implementing the concept. Existing models for implementing EBP offer stepwise approaches, nevertheless, certain factors, such as the context of care and its mechanistic nature act as barriers to the effective and consistent implementation of EBP. It is, therefore, imperative that a solution to solving the way in which evidence is applied into practice is found. Evidence-Informed Practice (EIP) is an evolving concept. In recent times, there has been a focus on EIP as an alternative to EBP. This has generated an international debate as to which of the two concepts better facilitate the application of evidence into practice. While several EBP models and educational interventions exist, little is known about the concept of EIP and how it facilitates the application of evidence into practice. This article aims at clarifying the concept of EIP and describes how it facilitates the application of evidence into practice. In addition, the article introduces an integrated model of EIP, which is grounded in a systems theory.

Keywords

Evidence-informed practice, Professional accountability, Evidence-based practice, Clinical decision-making

Key points:

- ✓ Two main concepts have been associated with the application of evidence into practice: EBP and EIP.

- ✓ The main feature that distinguishes EIP from EBP is the processes used in implementing the concepts

- ✓ EIP is the mechanisms or processes you go through to implement EBP.

- ✓ EIP is not a substitute or replacement for EBP. EIP is an integrated approach to applying evidence into practice, which incorporates the steps of EBP in its processes.

The Evidence-Based Movement: Origin and related concepts.

The evidence-based working group in the United States of America (USA) coined the term 'Evidence-Based Medicine (EBM)'. Their aim was to shift the focus in clinical decision-making from "intuition, unsystematic clinical experience, and pathophysiologic rational to scientific, clinically relevant research" (Guyatt et al. 1992 p.2420). However, Archibald (Archie) Cochrane is considered the inventor of EBM in the modern era (Stavrou et al. 2014). Archie Cochrane was an eminent physician and epidemiologist who at some point in his career joined the British army and served as a medical officer in prisoner of war camps during the Second World War. His experience during this period in the camp stimulated his believe that much of medicine did not have sufficient evidence to justify its use (Cochrane 1984).

Cochrane (1972) pointed out the importance of properly testing the effectiveness of healthcare strategies and stressed on the role of Randomised Controlled Trails (RCT) to provide evidence on which healthcare is based. An RCT is a study design that involves the assignment of individual participants in a study to either an intervention or a control group (Higgins and Green 2011). Cochrane's early work was eventually

developed by Rosenberg and Donald (1995, p.2). They defined EBM as "the process of systematically finding, appraising and using contemporaneous research findings as the basis for clinical decisions." Building on the works of Cochrane and Rosenberg and Donald, EBM has since evolved to include "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients" (Sackett 1996, p. 76).

The benefits of EBM have been adapted and implemented in other healthcare fields with the use of universal terms including Evidence-Based Practice (EBP), or more specific terms such as Evidence-Based Nursing (EBN). Central to all these definitions and terms, however, is the fact that they are based primarily on the original principles of EBM (Young et al. 2015).

Evidence-based nursing is specific to the nursing profession. It was first introduced to the literature by Nicky Cullum and colleagues in April 1997 before the launch of the EBN journal in November 1997. Cullum et al. (1997) described what EBN is and is not and how the concept was important in ensuring the best possible nursing outcomes for patients. Mulhall (1998, p. 5) further stated that evidence-based care in nursing "concerns the incorporation of evidence from research, clinical expertise and patient preferences into decisions about the health of individual patients." A myriad of researchers (including Flemming 1998; Dicensor et al. 1998; Ingersoll 2000; Thompson 2003) have offered definitions of the concept and how it impacts healthcare delivery and patients' outcome. Scott and McSherry (2009) conducted a review of the various definitions of EBN, with emphasis on the differences and similarities among these definitions. They concluded that EBN is "an ongoing process by which evidence, nursing theory and the practitioner's clinical expertise are critically evaluated and

considered, in conjunction with patient involvement, to provide delivery of optimum nursing care for the individual" (Scott and McSherry 2009, p. 1089). Internationally, nursing's professional regulatory bodies, such as the International Council of Nurses (ICN 2012), and Nursing and Midwifery Councils worldwide (e.g. the United Kingdom NMC code 2015) have incorporated the importance of basing nursing clinical decision-making and action on best evidence for practice. This article will use the universal term, EBP.

Evidence-based practice was first mentioned in the literature by Muir-Gray (1997). Muir-Gray (1997, p. 97) defined EBP as "an approach to decision-making in which the clinician uses the best available evidence in consultation with the patient to decide upon the option, which suits the patient best." Since its initial definition in 1997, EBP has gained prominence as the gold standard for the delivery of safe and effective healthcare. The concept has since been recommended by several healthcare agencies worldwide (e.g. UK NMC 2015; ICN 2012).

Are existing approaches of EBP effective?

Several researchers (including Sackett et al. 1996; 2000; Melnyk et al. 2014; Warren et al. 2016; Melynk 2018) have argued the need for effective and consistent implementation of EBP in clinical practice. Warren et al. (2016) explored the importance of applying EBP and concluded that effective implementation of EBP is required in today's healthcare reforms and value-based purchasing to aid in positive patient outcomes. The regularisation of healthcare using the best available evidence results in improved patient care delivery (Ubbink et al. 2013).

Regardless of its benefits, however, EBP has significant undesirable effects for healthcare delivery and policy. Critics have questioned its validity (Nevo and Slovin-

Nevo 2011; Rubin 2007); what setting, and practice works to support its use (Nutley et al. 2009); its failure to address the complexity of health and healthcare, and the patient's context (Muir Gray 1997); and its mechanistic approach (McNeill 2006; Epstein 2009).

Several models exist for the implementation of EBP. Examples include: Rosswurm and Larrabee's (1999) model; the Iowa model (Titler et al. 2001); collaborative research utilization model (Dufault 2004); the star model of knowledge transformation (Stevens, 2004); DiCenso et al.'s (2005) model; Greenhalgh et al.'s (2005) model; Johns Hopkins Nursing model (Newhouse et al. 2005) and Melnyk et al.'s (2010) model. Although a comprehensive review of these models is beyond the scope of this article, a brief assessment of the models reveals some shared commonalities. The common elements among these models include, asking or selecting a practice question, searching for the best evidence, critically appraising the evidence, applying the evidence, evaluating the outcome(s) of patient care delivery, and disseminating the outcome(s).

Despite the existence of multiple EBP models intended to facilitate the application of evidence into practice, nurses continue to struggle to effectively implement EBP (McSherry et al. 2002; Stevens 2013; Melnyk et al. 2014; Melnyk 2017; Mick 2017). Melnyk et al. (2012) and Melnyk (2017) believe the difficulty with the implementation of the concept among nurses is due to the lack of adequate skills and knowledge regarding the steps of EBP. This may be due to the fact that EBP skills and knowledge training was not fully included in nursing curricula until early 2000s (Stevens 2013). Thus, experienced practicing nurses may be novice about the implementation of the steps of EBP. The resultant effect is a dearth of experienced EBP role models (mentors) in the clinical setting for development of EBP skills among newly qualified

nurses and nursing students (Mick 2017).

Some proponents of EBP have proposed ways to improve the low implementation of the concept. In a recent study by Melnyk et al. (2018) to determine EBP competencies (including EBP knowledge, belief, skills and Implementation, among others) among nurses, it was revealed that key deficits exist that threaten patient safety, the quality of healthcare, and overall patient outcomes. Hence, there is the need for healthcare training institutions to include the training of EBP competencies in academic programs to ensure EBP competencies in graduating students (Melnyk et al. 2018). In addition, the authors recommend that health care organizations set competencies in EBP as a standard for all healthcare professionals. Greenhalgh (2013) and Greenhalgh et al. (2014) have also called for a resurgence of the concept, especially concerning the components of EBP associated with involving patients in decision-making, and with expert judgement and experience. Greenhalgh et al. (2014, p. 3) believe it is time to return to implementing "real EBP", where person-centred care is the top-most priority, and healthcare professionals and their patients "are free to make appropriate care decisions that may not match what best evidence seems to suggest".

Towards Evidence-informed practice

The quest for a solution to the low and inconsistent implementation of EBP led to the emergence of a term purported to address these problems: Evidence-Informed Practice (EIP). Evidence-informed practice is based on the premise that healthcare practice should, as a matter of principle be informed by, rather than based on evidence (Nevo and Slovin-Nevo 2011). This implies that other forms of evidence (for example, patient experiences, the nurse's expertise and experiences), not just the scientific evidence, should be considered in the application of evidence into practice. The term

'evidence-informed' first emerged in the scholarly literature few years after the inception of the evidence-based movement. Entwistle et al. (1998) coined the term Evidence-Informed Patient Choice (EIPC), aimed at tackling the practical issues associated with involving patients in healthcare decision-making. Additionally, it was intended to overcome the problems associated with the evidence-based movement of failing to recognize and integrate patient participation and experiences within the definitions.

Evidence-informed patient choice "involves providing people with research-based information about the effectiveness of health care options and promoting their involvement in decisions about their treatment" (Entwistle et al. 1998, p. 317). Evidence-informed patient choice has since been adopted by various disciplines, including nursing (evidence-informed nursing), social work (evidence-informed social work), education (evidence-informed teaching), and management (evidence-informed management). Other terms such as Evidence-Informed Decision Making (EIDM) and Evidence-Informed Policy Making have been used as well. Nevertheless, it is broadly referred to as EIP (Barrat and Hodson 2006; Epstein 2009; Nevo and Slovin-Nevo 2011). EIP is the assimilation of professional judgment and research evidence regarding the efficiency of interventions (McSherry et al, 2002). This definition was further elaborated by Nevo and Slovin-Nevo (2011) as an approach to patient care where:

> "Practitioners are encouraged to be knowledgeable about findings coming from all types of studies and to use them in an integrative manner, taking into consideration clinical experience and judgment, clients' preferences and values, and context of the interventions" (p. 18).

EIP has gained momentum in recent times, and it is often used instead of EBP. For example, in Canada, the term has been widely adopted and is used more often in the health and social care fields. This was reflected in a position statement by the Canadian Nurses Association (CNA 2008) and the Canadian Physiotherapy Association (CPA 2017), where healthcare practitioners, including nurses, clinicians, researchers, educators, administrators and policy-makers were encouraged to collaborate with other stakeholders to enhance EIP in order to ensure integration of the healthcare system. In addition, extensive research on the application of evidence into practice (termed knowledge translation) has been conducted in Canada. The term knowledge translation has been adopted by the Canadian Institute of Health Research to signify the use of high-quality research evidence to make informed decisions (Straus et al. 2009). In 2006, Graham and colleagues developed a "knowledge to action" model intended to integrate the creation and application of knowledge. The model acknowledges the nonlinear process of applying evidence into practice, where each stage is influenced by the next stage. Indeed, in a typical clinical setting, the actual process of applying evidence into practice is not linear, as indicated by proponents of EBP, but cyclical and interdependent. Ciliska (2009, p. 7) linked Graham et al.'s (2006) model to the components of EIDM. According to Ciliska (2009), the knowledge to action model "fits with the steps of EIDM".

In the United Kingdom, the term EIP has been extensively adopted in the field of education, with a lot of resources being invested to assess the progress towards an evidence-informed teaching (Coldwell et al, 2017). In addition, an evidence-informed chartered college of teaching has been lunched (Bevins et al, 2011) to ensure evidence-informed teaching and learning.

Although EIP seems desirable, its processes and outcomes are poorly understood, and demands careful review and evaluation (Entwistle 1998; McSherry 2007; Nevo and Slovin-Nevo 2011). Some proponents of EIP (such as Epstein 2009; Epstein 2011; Nevo and Slovin-Nevo 2011; Webber and Carr 2015) have identified significant differences between EBP and EIP and have argued that the term EBP be replaced with the term EIP. However, other researchers (for example, Gambrill 2010; Ciliska, 2009; Cordoso 2017) have used the terms interchangeably. For instance, Ciliska (2009) developed an EIDM module, but referred to the steps of EBP (i.e. Ask, Acquire, Appraise, Integrate, Adapt, Apply, Analyse) as the processes to be followed in implementing EIDM. Ciliska (2009) claimed the term EIDM was adopted to signify that other types of evidence are useful in clinical decision making, and, to attempt to get beyond the criticisms of EBP. This notwithstanding, the author maintained the existing process of implementing EBP. Similarly, in an article by Shlonsky and Mildon, (2014), there appeared to be contradictory statements on EBP and EIP as the authors consistently referred to an EBP approach as EIP. Examples of such include referring to the steps of EBP as "the steps of EIP" (p. 3) and referring to Haynes et al.'s (2002) expanded EBP model as "revised EIP model" (p. 2).

It is important to note that the main feature that distinguishes EIP from EBP is the processes used in implementing the concepts. Moreover, unlike EBP, EIP is flexible and "leaves ample room for clinical experience as well as the constructive and imaginative judgements of practitioners and clients who are in constant interaction and dialogue with one another" (Nevo and Slovin-Nevo 2011, p. 1176). Subsequent versions of EBP (for instance, Haynes et al. 2002; Melnyk et al. 2010) have attempted to shift focus from just the 'research evidence' to include patient preferences and circumstances and the clinician's expertise. This highlights the fact that research

evidence alone is not adequate in making decisions about patient care. Haynes et al. (2002) addressed some of the limitations of EBP in "a new prescriptive model for EBP", which recognizes 'patient preferences' rather than the 'health professionals preferences' or the 'research evidence' as the first priority in clinical decision making. This is essentially the tenets of EIP. However, it is not clear, from Haynes et al.'s (2002) model, the stages one has to go through to apply evidence into clinical practice. Evidence-based practice and EIP are two different concepts that integrate to facilitate the effective application of evidence into practice.

Implementing EIP into Clinical Practice: Systems Thinking

It has been over two decades since EIP emerged in the literature, however, primary research on the concept has been limited. Little is known about the methods needed for effective implementation of EIP. Consequently, the concept has had a relatively low implementation rate, and difficulties still exist in applying evidence into practice.

Over the years, proponents of EIP have focused their attention on arguing and explaining why the term EBP need to be replaced by EIP, instead of defining the actual processes involved in applying EIP. Thus, the concept remains a mirage in healthcare practice. Stakeholders and researchers in healthcare continue to invest in EBP (Tucker 2014), which has proven to be ineffective in applying evidence into practice. We cannot continue to do the same thing and expect different results. There must be a change in the way in which evidence is applied into practice. Indeed, change is difficult and occurs over time. As Allison et al. (2007, p. 1) rightly puts it, "one of the biggest challenges for healthcare practitioners is implementing a new programme or a new practice". Nevertheless, the reason for the seeming lack of acceptance of EIP

and the resultant low implementation are primarily due to inadequate information on strategies that foster efficient and successful implementation of the concept.

An alternative approach to lessen the adverse effect of "policy resistance" (in this case, EBP and EIP by nurses) is by viewing the problems in a more holistic way: systems thinking (McSherry and Warr 2010; Senge 1990). The clinical setting in which nurses work is a complex system made up of several interdependent and interrelated parts. Therefore, problems with healthcare delivery and management must be perceived as a consequence of the exchanges among the element of the systems instead of the outcome or malfunctioning of a particular element. Effective implementation of EIP demands an understanding of the various parts of the system that come together to aid the application of evidence into practice. McSherry (2007) established that the application of EIP passes through three stages (i.e. an input, throughput and an output). The "output" of applying EIP is an evidence-based practitioner: an empowered nurse who is a critical thinker and doer (McSherry 2007).

The drivers for EIP

For nurses to effectively implement EIP, it is essential to understand and identify the key elements that drive the successful implementation of the concept. This is referred to as drivers for EIP (McSherry 2007). Figure 1 illustrates some of the factors that initiate the implementation of EIP (drivers for EIP).

Figure 1: Drivers for Evidence-informed practice (adapted from Allison et al. 2007)
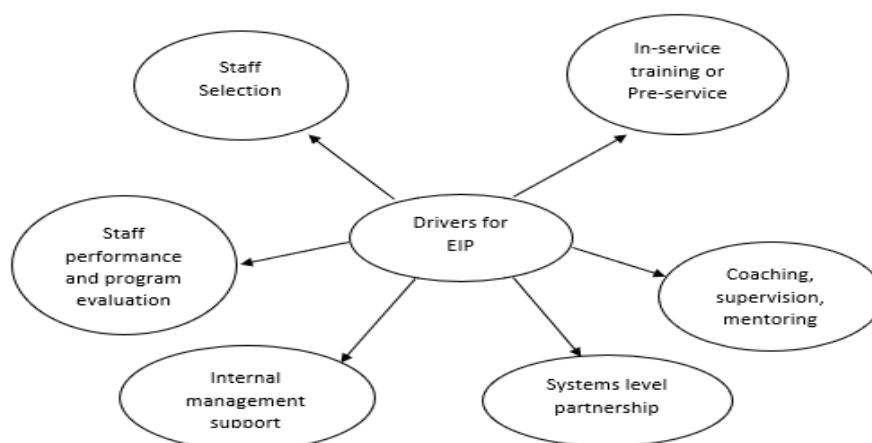
Staff selection:

Recruiting, interviewing and redeploying existing staff or hiring new staff are part of the staff selection process (Allison et al. 2007; Dill and Shera 2012). The importance of this driver is to identify personnel who qualify to implement the EIP program or model. Additionally, it aims at selecting the organizational members (for example coaches, supervisors and trainers) who will ensure that the required organizational changes to support nurses in effective implementation of EIP are done.

In-service training or Pre-service

Training on EIP programs or model involves activities that are related to offering instructions, specialized information or skill development in a structured manner to nurses and other key healthcare staff involved in the EIP program. Nurses, as well as other members of staff must learn when, how, where and with whom to use new

approaches and skills in applying evidence into practice (Allison et al. 2007; Dill and Shera 2012).

Coaching, supervision and Mentoring

Coaching and mentoring is a method in which new skills are introduced to nurses on the ward with the help of a coach. The duty of a coach is to offer expertise information together with encouragement, opportunities and advice to practice and apply skills that are specific to the EIP program. Effective implementation of human service interventions (such as EIP) require change in behaviour at the administrative, supervisory and practitioner levels (Dill and Shera 2012). Coaching and mentoring are the main ways to bring about a change in behaviour for staffs that were successfully involved in the beginning stage of the implementation process and throughout the life of the EIP program.

Systems-level partnership

Systems-level partnership refers to the improvement of partnerships with the broader and immediate systems to ensure accessibility of required funds, institutional and human resources that are needed to encourage nurses' work. The immediate system partnership refers to individuals or organizations that directly influence healthcare delivery (for example, nurses and doctors). However, partnerships within the broader system refers to policy makers, funders, or other organizations that may support the EIP program, but are not directly involved in healthcare delivery. Various activities may be conducted in the development of systems-level partnership to aid in implementation of EIP. These may include fundraising activities to help the implementation of EIP

programs, as well as the use of external coaches and consultants to assist with on-going mentoring, technical assistance and training.

Internal management support

Internal management support involves activities that are associated with establishing processes and structures within an EIP program that enhance effective implementation of the program. Internal managerial activities that aid implementation of EIP will offer leadership and make use of a variety of data inputs. This is necessary in order to inform healthcare decision-making as well as keep staff organized and focussed on desired care outcomes (Fixsen et al. 2005). Instances of internal management support include the formation of institutional structures and processes, the allocation of resources to support selection of suitable staff, and administrative support for efficient training.

Staff performance and program evaluation

Staff assessment is intended to evaluate the application and results of the skills that are mirrored in the staff selection criteria, learnt during in-service training, and expanded and reinforced during coaching processes (Allison et al. 2007; Dill and Shera 2012). In addition, evaluation is designed to offer trainers, coaches, interviewers and managers insight about the improvement of implementation efforts and the effectiveness of selection, training and coaching.
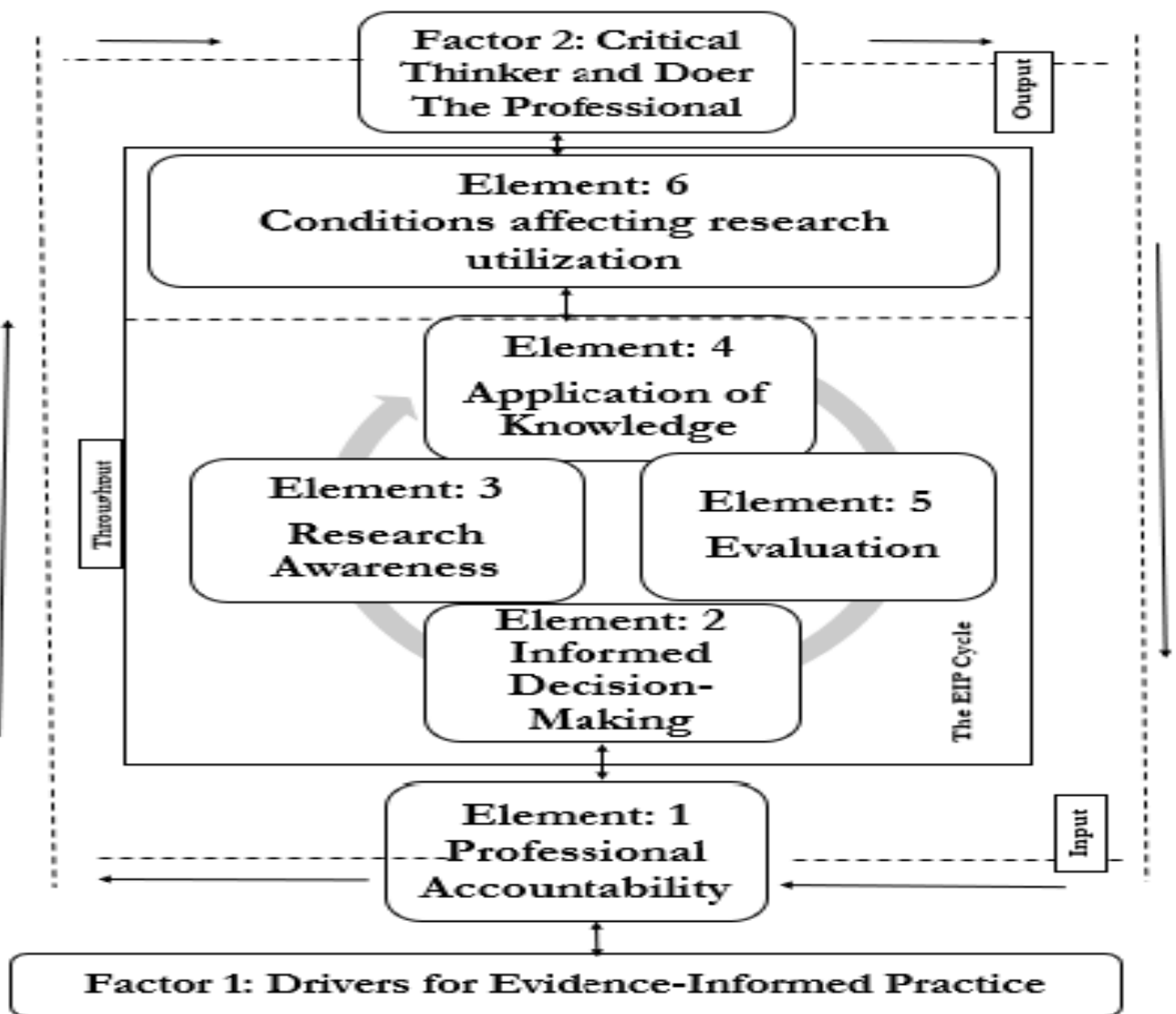
The EIP model

The EIP model presented in Figure 2 is a revised version of McSherry's (2007)

evidence-informed nursing model. The new EIP model is grounded in the principles and practices of systems thinking. This is because, primarily, the model offers an integrated process to applying evidence into practice, consisting of an input, throughput, and an output. The elements of the EIP model are explored in more details in the subsequent sections, by means of a case scenario.

Case Scenario

Mitchell, aged 58, arrives in the emergency department complaining of severe chest pain. He is diaphoretic and says his pain is radiating down his left arm and up into his jaw and adds that he is nauseated. A few minutes after admission, Mitchell suffers a cardiac arrest. He is resuscitated and transferred to the Intensive Care Unit (ICU). He is intubated, is on a ventilator, and has a central-line catheter in place.

Figure 2: The Evidence-Informed Practice Model

Factor 2: Critical Thinker and Doer — The Professional

Output

Element: 6 — Conditions affecting research utilization

Throughput

Element: 4 — Application of Knowledge

Element: 3 — Research Awareness

Element: 5 — Evaluation

Element: 2 — Informed Decision-Making

The EIP Cycle

Element: 1 — Professional Accountability

Input

Factor 1: Drivers for Evidence-Informed Practice

Input: Professional Accountability

The first element of the EIP model is professional accountability. This is depicted as an "input" in the EIP model. Professional accountability is an essential part of a health practitioner's roles and responsibilities. In professional accountability, the health professional and the patient engage in shared decision-making and the practitioner is held answerable to the patient and his or her professional colleagues. Using the scenario about Mitchell, the nurse needs to be well-informed about Mitchell's clinical presentation (e.g. the symptoms and causes of cardiac arrest) and is expected to

make patient care plans and decisions based on information gathered from the patient and in accordance with his/her professional knowledge. The nurse takes responsibilities for his/her actions, judgements and omissions in order to uphold both the standards of the nursing profession and improved patient care outcomes.

Throughput/Process (The evidence-informed practice cycle)

The process/throughput (the EIP cycle) is the method or procedure through which the health practitioner applies evidence into practice. This occurs in a recurrent manner by going through the following processes:

Informed decision-making: this is the two-way communication between a practitioner and a patient that is key to person-centred care. It reaffirms the ethical principle of a patient's right to make an informed decision of what is suitable for them, considering their beliefs, priorities and personal circumstances. Using the case scenario, the critical care nurse is expected to involve patient relatives, medical staff and other members of the healthcare team in making decisions about, for example, ventilator management and care of the central line catheter. Decision-making in an ICU can be complex, and some of the decisions may involve the nurse only (Maharmeh et al. 2016). However, where possible, the nurse must endeavour to involve the patient/family member in the process by providing them with the relevant information needed to make such decisions.

Research Awareness: research awareness involves motivating practitioners to acquire skills and knowledge, and to conceptualize what research and evidence involves and their significance in improving standards of healthcare practice (McSherry et al. 2006). Research awareness is reliant on the practitioner's attitudes towards research, knowledge and confidence about research, and on supportive

managers and colleagues.

This element of the EIP model incorporates three of the existing steps of EBP (i.e. to ask a question, search the literature for research evidence to answer the question, and to critically appraise the evidence obtained). Although the nurse is not required to be a researcher to effectively implement the EIP model, he/she must be knowledgeable about relevant search engines and databases (e.g. Google, Medline) as well as critical appraisal tools in order to include high-quality research evidence in patient care decisions. Nevertheless, the EIP model acknowledges the fact that research evidence may not always be readily available, and nurses may not have the needed software and hardware in the care environment (Thompson 2003) to search for research evidence. Hence, in support of Greenhalgh et al. (2014), the EIP model recognises nurses as critical thinkers and doers, and therefore, allows them to make appropriate care decisions based on patient preferences and actions, the clinical state, clinical setting and circumstances, and the nurse's knowledge, expertise and clinical experiences, which may not necessarily match what the research evidence seems to suggest.

Using the case scenario, the nurse updates his/her knowledge on Mitchell's clinical presentation. The nurse searches Medline for research evidence on 'cardiac arrest' and its associated symptoms. Based on the number of articles obtained, the nurse reads the titles and abstracts, and then, the full text of selected articles to exclude irrelevant articles. The remaining articles are then critically appraised to include the best research evidence in patient care decisions. In situations where this is not possible, the nurse is encouraged to make the best care decisions based on patient preferences, clinical state, context and circumstances, and the nurse's expertise and

experiences.

Application of knowledge: Using the case scenario, the nurse applies knowledge obtained from Mitchell and relatives, the research evidence, the multidisciplinary care team, the nurse's own knowledge, expertise, and experiences to make appropriate care decisions. For the nurse to effectively do this, he/she requires certain institutional and personal characteristics. Institutional features include culture, education and training, and workload/skill mix, while as personal characteristics include improved confidence, attitude, understanding and behaviour towards the application of evidence into practice.

Evaluation: this element of the EIP model measures the effect of decision-making and actions of health professionals on patient care outcomes. Using the case scenario, the nurse periodically evaluates specific processes and outcomes of Mitchell's care, such as how Mitchell is performing on the ventilator, development or absence of infections related to insertion of central line, nosocomial infections, as well as improvement in Mitchell's general wellbeing. Depending on the outcome of the evaluation, Mitchell's care plan is either revised or continued.

Output

The successful implementation of the EIP model results in an evidence-based professional nurse, a critical thinker and doer who is "knowledgeable and skilled, yet welcomes alternative ideas and belief systems, appreciating and respecting alternative views" (Brechin, 2000, p. 44).

Conclusion

EIP is an integrated approach to applying evidence into practice, which incorporates

the steps of EBP in its processes. In other words, EBP is a subset of EIP. Thus, EIP is neither an alternative to or a replacement for EBP. The EIP model provides a framework for practitioners to deliver clinically effective care and to be able to defend the processes used and the service provided by referring to reliable evidence (McSherry, 2007; McSherry et al, 2002). Future initiatives should focus on developing EIP educational interventions and determining the effects of such interventions on healthcare students' knowledge of and attitudes towards the application of evidence into practice.

Reflective Questions

Now that you have completed the article, you might want to make a reflective note by providing answers to the following questions:

1. Make a list of the challenges you encounter in implementing EBP

2. Use the same list and indicate how these challenges prevent you from using evidence to support your nursing clinical decisions and actions in practice

3. How does viewing health and healthcare delivery as a complex system impacts on your patient care?

4. Make a list of the drivers that are encouraging you to support your clinical nursing decisions and actions with evidence.

5. Using your own experience to date and the information presented in the text, make a list of why and how you think evidence-informed practice forms part of your professional accountability and professional registration.

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Figures

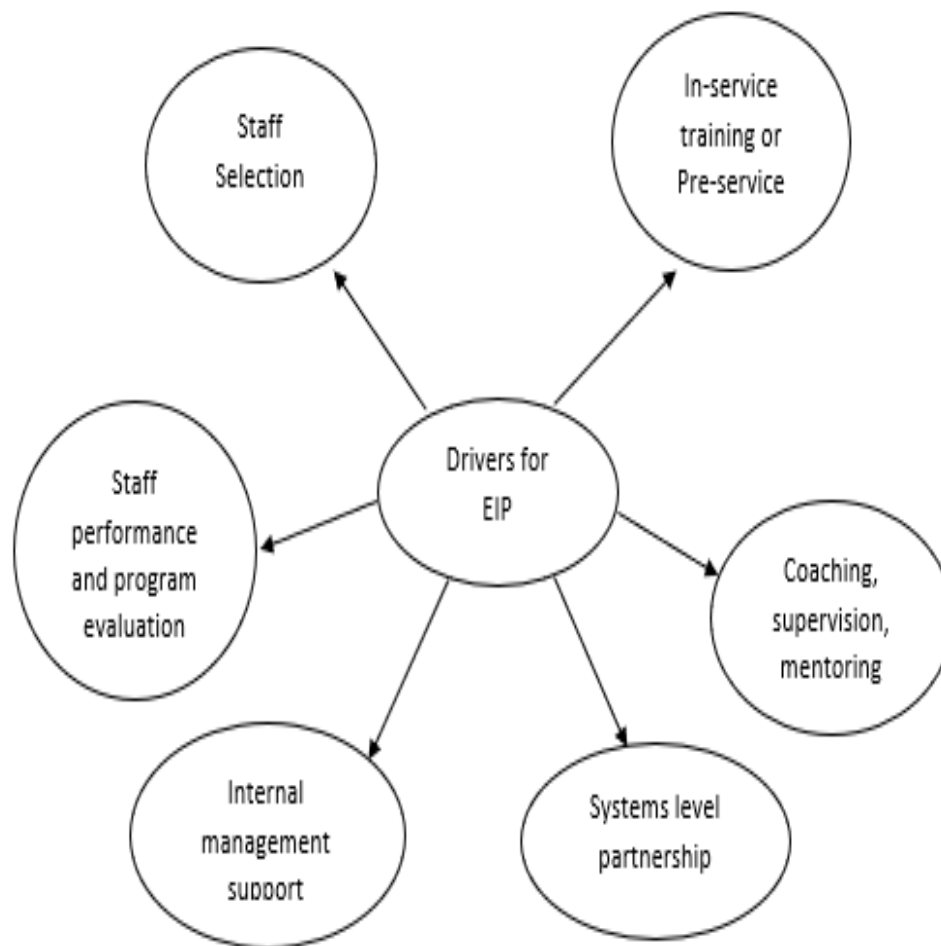*Figure 1: Drivers for Evidence-informed practice (adapted from Allison, Blasé and Bowie, 2007)*

Figure 2: The Evidence-Informed Practice Model