

Evidence-based reviews: principles and methodological considerations

KEY WORDS

- ▶▶ Evidence-based medicine
- ▶▶ Evidence-based practice
- ▶▶ Evidence-based reviews

Evidence-based medicine and evidence-based practice are very much an accepted foundation of current clinical practice. Often presented as a tri-partite association the application of evidence-based medicine should take into consideration the best available evidence, clinical expertise and patient values. Outcomes of research studies can provide a sound basis for clinical practice, however, a common criticism of primary research, particularly randomised controlled trials, is that they do not truly represent the clinical reality. Relying solely on best available evidence potentially ignores the importance of clinical expertise, therefore, there also needs to be a degree of pragmatism when judging the evidence base for an intervention. This article discusses the hierarchy of evidence and acknowledges the importance of systematic reviews. In addition, it explores the potential for employing evidence-based reviews as an alternative method for informing clinical practice.

Research methodology is categorised broadly as quantitative or qualitative (Meadows, 2003). Qualitative research aims to explore the experiences and views of the participants, as opposed to quantitative research, which involves testing a specific hypothesis through precise measurement and statistical analysis (Pope and Mays, 1995). The approach used in qualitative design to establish facts is known as inductive reasoning (Meadows, 2003), however, one limitation of this approach is that generalizations cannot be proven beyond the situation of the study (Aveyard, 2014).

Different approaches to critiquing qualitative and quantitative research are required, with the appraisal of qualitative studies focused on the methodology as opposed to the evaluation of numerical data in quantitative research (Ryan et al, 2007). Seale (1999) proposes that by combining qualitative and quantitative research, a research topic or question can be explored from different perspectives. Other authors contend that the study design should be selected according to the topic being investigated (Greenhalgh, 2010, Coughlan et al, 2007).

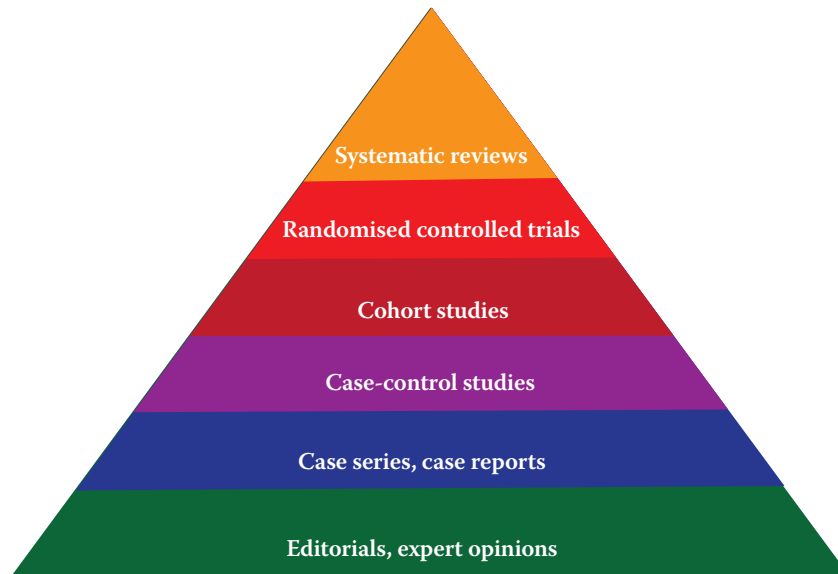
EVIDENCE-BASED MEDICINE AND EVIDENCE-BASED PRACTICE

Evidence-based medicine (EBM) involves the application of research and scientific knowledge to clinical practice, to enable safer, consistent and more cost-effective patient care (Greenhalgh et al, 2014) and has been taken to refer to medical practice, i.e. EBM and evidence-based practice (EBP) are very much an accepted foundation of current clinical practice. Often presented as a tri-partite association the application of EBM should take into consideration the best available evidence, clinical expertise and patient values. Outcomes of research studies can provide a sound basis for clinical practice however a common criticism of primary research, particularly randomised controlled trials, is that they do not truly represent the clinical reality. Relying solely on best available evidence potentially ignores the importance of clinical expertise, therefore, there also needs to be a degree of pragmatism when judging the evidence base for an intervention. This article discusses the hierarchy of evidence and acknowledges the importance of systematic reviews. In addition, it explores the potential for employing evidence-based reviews (EBRs) as an alternative method for informing

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Figure 1. Hierarchy of evidence (Guyatt et al, 1995)



clinical practice (Woodbury and Kuhnke, 2014). This has subsequently been referred to by some as EBP, to reflect the interplay of scientific evidence, clinical expertise and individual patients’ needs and choices (McKibbin, 1998).

Aveyard (2014) contends that clinicians have a professional duty to keep informed about research that informs their practice, to enable relevant treatment decisions. The ability to critically appraise the evidence is, therefore, an important quality in modern healthcare. The EBM hierarchy (*Figure 1*) was developed to enable clinicians to assess the strength of evidence available, to facilitate clinical decision-making (Guyatt et al, 1995). Randomised controlled trials and systematic reviews of these are considered the strongest method to evaluate the clinical effectiveness of interventions in medical research, in comparison to other types of study designs, which are placed lower in the EBM hierarchy (Ho et al, 2008). However, some authors debate that the inclusion criteria of a randomised controlled trial may exclude patients with

multiple complexities (Carter and Warriner, 2008; Greenhalgh, 2014), when these patients may benefit the most from an advanced treatment intervention.

Evans (2003) contends that the hierarchy of evidence should only be used as a guide since the methodological rigour of individual studies must be taken into account. Considering the recent National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance (NPUAP, EPUAP, PPPIA, 2014) clinical guideline, to give an example of strength of evidence supporting clinical practice, it is clear that the majority of the guideline is based on indirect evidence and consensus, with over 500 recommendations based on a lower level of evidence (C) (*Table 1*). Reliance on evidence levels A and B alone would have limited the breadth of the guideline as well as restricting its’ implementation in clinical practice. This approach supports the notion that clinicians must take into account all forms of evidence when making a decision about a patient.

Table 1. Prevention and treatment of pressure ulcers: clinical practice guideline (NPUAP, EPUAP, PPPIA, 2014)		
Strength of evidence*	Description (brief)	Number of recommendations
A	Recommendation supported by direct scientific evidence from properly designed and implemented controlled trials on PU in humans (level 1 studies)	5
B	Recommendation supported by direct scientific evidence from properly designed and implemented clinical series on PU in humans (level 2, 3, 4, 5 studies)	72
C	Recommendation supported by indirect evidence and/or expert opinion	519

* Based on the classification system adapted from Sackett (1989)

Box 1. Principles of a review protocol for an EBR

- ▶▶ Selecting a topic for review
- ▶▶ Scope of the review
- ▶▶ The review protocol
- ▶▶ Assessment of methodological quality of the studies
- ▶▶ Studies included in the review
- ▶▶ Reliability and validity
- ▶▶ Results
- ▶▶ Discussion
- ▶▶ Conclusion.

EVIDENCE-BASED REVIEWS

EBRs can facilitate the exploration of an issue or argument or origins of an idea, or provide evidence for decision-making. The following definition an EBR is adapted from Moher et al (2009):

"...a review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant evidence, and to collect and analyse findings from the evidence."

Such reviews are linked to a clear clinical question and follow a methodical approach to allow a wide-ranging investigation of treatments, programmes, approaches or decision-making processes in healthcare (Hart, 2005). The findings of an EBR can be translated into clinical practice as follows:

- ▶▶ Improving the choices patients have of services and treatments
- ▶▶ Making measurable improvements in clinical practice
- ▶▶ Improving the management of health service provision.

Aveyard (2014) contends that EBRs are important because they provide a summary of all available research, enabling an accurate representation of a specific topic. In comparison to an EBR, systematic reviews and systematic reviews with meta-analyses, such as those undertaken by the Cochrane Collaboration are considered more robust in terms of strength of evidence (Hoppe et al, 2009). This is due to the stringent inclusion and exclusion criteria used within an SR (Greenhalgh, 2010), however, one of the key aspects of an EBR is that relevant evidence is identified and evaluated in a systematic way, within a framework of relevant criteria.

Although an EBR may be considered by some to be lower in the EBM hierarchy, as it is perceived as more of a narrative, literature review, a good quality EBR combines a methodical and systematic {logical} approach to literature searching (Aveyard, 2014). The inclusion of studies of different designs with high methodological rigour still allows conclusions to be drawn, which may be more relevant to clinical practice (Guyatt et al, 2000).

THE METHODOLOGY OF EBR

The process of an EBR takes into account the application of scientific strategies in ways that limit bias and involves assembling, critically analysing and synthesis of relevant studies to address a specific question (Crowther and Cook, 2007). Key skills related to identifying relevant evidence include:

- ▶▶ Searching
- ▶▶ Selecting
- ▶▶ Appraising
- ▶▶ Interpreting
- ▶▶ Summarising.

An EBR is not a narrative review, which tends to lack explicit descriptions of systematic methods i.e. a chapter in a textbook. Unlike a systematic review, an EBR normally considers findings from other types of research (i.e. non-experimental or grey literature) to provide a more comprehensive account of the evidence as a whole.

Undertaking an EBR requires a sound understanding of databases and indexing in order to conduct a robust review. The evidence is critically analysed in a methodical way and the subsequent conclusions drawn can be used to develop a clinical guideline/pathway best practice statement or suggest a protocol for a research study. Comparable to an SR, an EBR relies on the scope and quality of included studies as well as what was found, and the clarity of reporting. Similar to an empirical research study it requires a protocol or 'set of rules' to collect and report on the evidence. Furthermore, it requires a clear research question that considers an outcome-level assessment which is mindful of reporting bias, i.e. selective reporting of complete studies (publication bias) or outcome reporting bias, i.e. selecting the outcomes to report. The key principles of an EBR are summarised in *Box 1* and the key features are outlined below:

Table 2. PICO framework: an example for iNPWT

Population	Intervention	Comparator(s)	Outcome
Humans with acute surgical wounds	iNPWT	Post-operative dressings	Surgical site infection Wound dehiscence Haematoma Seroma Hypertrophic scarring Skin necrosis Patient harms

- ▶▶ The review should propose a specific and focused question using the PICO approach (intervention, population and outcome variables of interest need to be included)
- ▶▶ The method of the review should be specified with sufficient clarity to ensure the reader can determine if important, relevant studies were likely to have been omitted from the analysis
- ▶▶ Explicit criteria that define the reasons why individual papers were selected or not selected for inclusion should be presented
- ▶▶ The reader should be able to determine from the extracted information if the primary studies included in the review were methodologically valid.

DEVELOPING AN EBR RESEARCH QUESTION: AN EXAMPLE

In order to develop a balanced and focused clinical research question for an EBR, it is recommended to use the PICO approach outlined by O'Connor et al (2008), an example of which has been provided in *Table 2*. The PICO acronym enables the review question to be framed in terms of the population, intervention, comparator(s) and outcomes of the studies to be included, thus providing a structured process for the search strategy (Cooke et al, 2012).

In the example provided, the population was restricted to humans with acute surgical wounds. The intervention was incisional negative pressure wound therapy (iNPWT). The clinical outcomes related to the impact of iNPWT on the prevention of surgical site infection (SSI), wound dehiscence, haematoma and seroma, hypertrophic scarring and skin necrosis, in addition to any adverse effects. Based on this a search strategy was developed to include the appropriate search tools (electronic databases, search engines and websites), search terms, as well as inclusion and exclusion criteria.

Once the evidence had been identified the literature was rated according to the Consolidated Standards of Reporting Trials (CONSORT) statement (Moher et al, 2010) which was used to critique the methodology, results, conclusion and validity. This was utilised alongside The Critical Appraisal Skills Programme (CASP) tool to identify risk of bias and rigour of included comparative studies (CASP, 2013). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses

(PRISMA) guidelines (Moher et al, 2009) were followed in addition to The Cochrane Handbook for Systematic Reviews of Interventions to enable a systematic approach to review the literature (Higgins and Green, 2011).

DISCUSSION


The prevailing view in healthcare is that evidence should be used to guide clinical practice but healthcare professionals, particularly those working within wound care, are faced with the dilemma of the lack of robust (high-level) evidence (i.e. systematic reviews and meta-analyses) for much of what they do in clinical practice. Doing nothing is not an acceptable option, therefore, healthcare professionals must look to other forms or strengths of evidence in order to make decisions about the most appropriate care for a patient. Whilst systematic reviews are no doubt rigorous if undertaken adhering to the core principles, there may be practical problems, e.g. time and resources that can introduce bias and weaken the overall methodological robustness (Mallett et al, 2012).

A simple search of the Cochrane Database of Systematic Reviews using the term 'wound' provides a list of 157 reviews, narrowing that to the last 3 months provides a list of 4 reviews, one of which is focused on dressings and topical agents for venous leg ulcers (Norman et al, 2018). Whilst the authors acknowledge that compression therapy is the first line treatment the review concentrates on dressings which is perhaps counter-intuitive as accepted practice dictates that compression therapy in conjunction with a topical dressing is needed for venous leg ulcer healing (Tate et al, 2018). Yet Norman et al (2018) and the many other authors of systematic reviews, have followed the accepted rigorous methodology required for a Cochrane style systematic review.

The introduction of evidence summaries, for example, Chronic wounds: advanced wound dressings and antimicrobial dressings (National Institute for Health and Care Excellence [NICE], 2016) and rapid reviews of evidence, e.g. exploring nurses' and patients' feelings of disgust associated with malodorous wounds: a rapid review (Ousey and Roberts, 2016), have helped to speed up access to evidence. However, there are recognised limitations of such methods which have been

criticised for not employing the strict rigour of systematic reviews (Cochrane Training, 2018). In contrast, undertaken properly, an EBR uses a systematic approach within a defined framework to maintain rigour. An EBR can therefore offer a pragmatic solution to examining the evidence base for a topic and can facilitate the development of clinically relevant information.

CONCLUSION

The intention of this discussion was to reiterate the importance of EBM and evidence-based practice. The premise of the debate is that healthcare professionals need reliable evidence on which they can base their clinical practice. The accepted view is that the hierarchy of evidence provides a framework for judging the relative level (strength) of evidence and systematic reviews and meta-analyses of these are considered to be the highest level. However, used in isolation, this approach does not take into account the accompanying principles of EBM, which include clinical expertise and patient values. Whilst patient values were not addressed as part of this discussion, the notion of the role of clinical expertise is reflected in the concept of EBR and how the outcomes of these can be used to inform clinical practice. 

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ACKNOWLEDGMENTS

This article is based, in part, on Joanna Peart's Masters Dissertation Submission for the Masters in Wound Healing and Tissue Repair at Cardiff University