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# Interpreting research to inform practice : the hierarchy of evidence framework

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## **Interpreting research to inform evidence-based practice: A complimentary familial approach to using the hierarchy of evidence framework**

### *Abstract*

**Background** This paper examines the hierarchy of evidence (HoE) framework and evidence-based practice (EBP) for clinical practice and nurse education. Student evaluations of a post-qualifying EBP module identified consistent tension in interpreting research papers which did not appear to “fit” into their experience of nursing practice. Community nurses identified a lack of evidence informing their practice.

**Design** A mixed methods study facilitated a comparative analysis of HoE framework and a complimentary Familial model developed to improve student understanding. Data collection methods included a focus group of module members (n=5), a sample of n=314 respondents.

**Findings** Identified the HoE framework fails to help nurses interpret high and low evidence, thereby reducing the potential to implement evidence into clinical practice, but it was not clear why. The ‘Familial model’ appeared to enable a better understanding and relevance of evidence to inform clinical action. This is a unifying principle for EBP, yet one not found within a HoE framework.

**Conclusion** The art of nursing does not merely respond to published literature, but patient interaction and clinical implementation for community nursing requires a broader interpretation of EBP for nursing action.

Keywords: Evidence-based practice, hierarchy of evidence, Familial model

### *Introduction*

This paper presents an educational research study initiated following student feedback of an evidence-based practice (EBP) module. Like EBP teaching programmes worldwide (Sheldon et al., 2016) post-qualifying (community specialist public health nurses, health visitors, school nurses, oncology, community and hospital-based nurses) were required to write a 3000 word essay on a clinical practice issue, demonstrate a critical understanding of the research process and five-step levels of evidence, called a hierarchy of evidence (HoE) framework (see table 1: Levels of evidence, abridged from GRADE, Gyatt et al., 2011) was central to the module content.

Guyatt et al's (2011) GRADE system of rating quality of evidence (see table 1 entitled *Levels of evidence*) has seven levels of evidence, with varying impacts for clinical practice. GRADE's level 1 criteria refer to evidence obtained from a systematic review or meta-analysis of all RCT's. Notably, level 1 criteria aim to collate evidence appraised by a protocol with pre-specified eligibility criteria to address a specific research question. The pre-specified criteria, which are published before a review, attempt to reduce bias and interpret evidence into an accessible format (Green, Higgins, Alderson, Clarke, Mulrow & Oxman, 2011). For example; systematic reviews are suggested to provide the best level of evidence, with RCTs a close second (Murad, Asi, Alsawas & Alahdab, 2016). Later down the HoE framework with level 5 and 6, are evidence from a systematic review of qualitative studies. Notably, good qualitative research studies, especially phenomenological methodologies (making explicit bias and any pre-conceived ideas) aim to be as transparent as possible for the reader to follow any decisions taken during the research process (Smythe, Ironside, Sims, Swenson & Spence, 2008). Yet these studies are low

down in the HoE framework. Lastly level 7 refers to opinions from authorities and/ or reports from expert committees.

Level 1	evidence (and clinical guidelines) appraised by a systematic review and meta-analysis of RCT's (protocol with pre-specified eligibility criteria to address a specific research question)
Level 2	evidence obtained from one or more RCT
Level 3	evidence from a well-designed controlled trial without randomisation
Level 4	evidence from a well-designed case control and cohort studies without randomisation
Level 5	evidence from a systematic review of descriptive and qualitative studies,
Level 6	evidence from a single descriptive or qualitative study
Level 7	Expert opinion

*Table 1: Levels of evidence (abridged from GRADE, Gyatt et al., 2011)*

Although a HoE framework includes research ranging from scientific, humanistic to personal experience, the top of the hierarchy is dominated by a scientific paradigm (Guyatt et al., 2011). This was of practical concern for the students given the status of empirical research, because there is a need not only to question the validity and interpretation of a hierarchical EBP, but to tactically challenge its structure (Wieringa, Engebretsen, Heggen & Greenhalgh, 2017). Indeed, advocates and opponents of EBP have said very little about how such alternatives could be constructed (Wieringa et al., 2017). Not surprisingly, the reliable debate regarding the philosophical underpinning of EBP is again aired (Wieringa et al., 2017), but with few helpful alternatives in terms of a framework for organising and interpreting published research into the real world of clinical practice. This is what this research study presents. The end of semester module evaluation highlighted similar concerns about the HoE framework, mainly in interpreting EBP and “what works” for real world application into nursing

practice. Wieringa et al., (2017) suggests the crisis in evidence-based practice (EBP) is largely due to the unmanageable volume of evidence and statistically relevant benefits which may have marginal benefits to clinical practice. The students' concerns therefore were not surprising because EBP, like change and innovation in the National Health Service (NHS), is top down, appraised by expert reviewers at the National Institute for Health and Clinical Excellence (NICE), which often leads to local problems of interpretation and implementation. The EBP module was developed to address this issue yet promoting the interpretation of EBP has two critical points. First, clinical decision making should be left to clinical practitioners' who are ideally placed to decide the relevance of available evidence and their implementation (Sullivan, 2017). Second, EBP needs to be implemented with patient participation and empathy to ensure patient centred care (Sullivan, 2017) of "what works" (Fairbrother, Cashin, Mekki, Graham & McCormack, 2015). The feedback from the students' module evaluation led to discussion with the module team and an alternate model of appraisal developed to understand learning for meta cognitive and meta affective reflection.

#### *Community public health nurses finding*

The module evaluation had a strong familial characteristic, due to the high proportion of community nurses on the module. Students identified three EBP implementation issues from their clinical practice. First, the absence of clinical (guided) supervision for practitioners working with women suffering with peri-natal depression and offering listening visiting (Regan, 2012). Second, with the use of emancipatory practice development (EBD) units, prevalent in child and family services requiring a practical interpretation of EBP to adopt grass root initiatives

(Fairbrother et al., 2015). Community nurses identified both EBP and EBD aimed to establish the most effective interventions and implement them (Fairbrother et al., 2015). However, criticism of EBP is that it focuses on the first aim (effective interventions), rather than implementation (Fairbrother et al., 2015). Conversely, EBD as an implementation strategy is criticised as being contextually localised and the science behind the implementation adapted and shaped to the context (Fairbrother et al., 2015). Unlike hospital-based nursing and the use of the medical model, community public health nursing requires a more nuanced approach to EBP.

Third, students' concerns referred to a lack of evidence on the clinical and cost effectiveness of public health interventions when working with families and children. This was found to be the case with the National Institute of Health and Clinical Excellence (NICE, 2008; 2017, p. 32) guidelines entitled *Appendix A: Summary of evidence from surveillance* (see figure 1) updated in 2017 on child and maternal nutrition. The guidelines identified factual, editorial corrections and gaps in the evidence base informing practice, and students' concerns appeared to be well founded.

Lack of evidence on the clinical and cost effectiveness of:
1. ...targeting specific socio-economic, ethnic, low income or vulnerable groups
2. ...improving nutrition of mothers and children aged under 5
3. ...identifying the economic benefits of public health interventions to improve nutrition of mothers and children under 5
Lack of well-designed intervention studies on how to:
1. ...improve the nutritional status of women antenatally and during pregnancy
2. ...enable women who are obese to reduce the associated health risks

3. ...help post-partum women with their nutritional needs and weight
4. ...help reduce iron intake vitamin D status and reduce salt in infants and children
5. ...measure and validate nutritional status before and after an intervention
6. ...providing process and qualitative data to improve future replicability
7. ...evaluated the use of food vouchers to encourage healthy eating

*Figure 1: Summary of evidence for 2017 surveillance of maternal and child nutrition (NICE, 2008, p. 32).*

### *The Familial model*

To make an explicit defence of alternative kinds of medical knowledge and its application into EBP for nursing, the HoE framework's limited perspective was broadened to include a strategic and tactical way forward, in the form of an alternative textual taxonomy called the Familial model (see figure 2) below. The Familial model was derived from the notion that interpretation starts and ends with a tacit reference to familial roles in western society, and those significant nurturing roles that shape a humans' shared understanding of the world throughout life. From a Heideggerian (2003) perspective this intuitive ontological concept refers to when a human being (dasein) becomes aware of themselves located temporally in time. Before the time of existential realisation humans are aware, yet unaware of themselves in any deep sense as an individual because for most of their formative years beforehand since infancy have been in the company of other people [mitsein] (Heidegger 2003). This means that the language-in-use has many years of understanding intuitively before a fuller and critical awareness of interpretation can be appreciated (Gadamer, 2004).

- Mother discourse: *your argument from which all ideas grow (giving birth) to ideas, nurturing corporeal ideas, qualitative experience, feeling and emotion*
- Father discourse: *attachment text (systematic reviews, quantitative research [RCTs], canonical text, technological language)*
- Sister discourse: *subsidiary or supporting arguments*
- Brother discourse: *subsidiary or counter arguments*
- Grandmother discourse: *old narrative that hold importance and continue to be involved in ideological and social opinion*
- Grandfather discourse: *narrative that keep on generating dialogue and debate*

*Figure 2: The Familial model*

The terms in use require further definition. The “Mother discourse” is the planning and structuring part of the research process; the health care professional’s own draft-writing, ideas and formation of critical questions. This approach allows for evidence that is underpinned by “patterns of knowing” (Carper, 1978) not recognised by the familiar HoE hierarchies on which one bases clinical judgement to formulate new questions (Loughlin, Bluhm, Buetow, Borgerson & Fuller, 2017). The “Father discourse,” is the most valid and evidence-based supporting action; the supplementary research that is empirical and canonical, to which we attach our argument. This is evidence that can be evaluated in scientific terms rather than a Mother’s instinctive ‘ways of knowing’ (Edwards, 2001). The “Sister” and “Brother” discourses are



additional arguments that are not in the research canon, but offer encompassing or additional evidence, and stand as counter arguments to one other, perhaps with specific gender relations. The “Grandmother” (giving birth to the reader’s birth mother) discourse are those arguments within books and journals that still hold importance and continue to be involved in the ideological and social opinion of a contemporary healthcare arena. The “Grandfather” discourse, while sharing similar attributes of long-standing ideological production and reception, is concerned with problems in the healthcare arena that keep on generating dialogue and debate. If the student can identify these differences, it was hoped they would be able to create tacit boundaries between the text and its interpretive analysis, contemporary and established ideas (Foucault, 2005).

The reader of any research must be able to formulate a criterion for evidence and eliminate (or reduce) information outside of the search strategy that is unhelpful (Parahoo, 2014). However, what should be included or excluded is an artificial benchmark held together by a narrow positivism. For the healthcare professional to be able to think beyond a HoE framework and charter a route through considerable evidence is not easy, and so the Familial model enables the reader to organise evidence into some order that also offers inclusion. A critical issue when reading EBP through the HoE framework, like any text, is the dynamic relationship between interpretation and temporal understanding (Ricoeur, 1990) which we discuss next.

### *Temporal understanding and the Familial model*

Interpretation involves the translation of the text by the reader to reach some understanding of the text (Ricoeur, 1990). The process of understanding may develop

first through misunderstanding of the text before some clarity is reached by the reader. We say “some” because when reading, understanding is never complete because it is a time limited, dynamic activity, with the reader often stopping and starting, and developing new insights by a dynamic reading of other text before returning to the other (Gadamer, 2004). One reader may understand the text differently from another reader depending on the temporal elements of understanding, for example, grasping the (relevance and) meaning of text depends on experience, whether life or clinical, and if a reader has little or no relevant experience, then their understanding of the text will be less informed than another reader with experience. This is where the Familial model has a complimentary relationship with the HoE framework. Reading of text goes through an interpretive process called the “hermeneutic circle” and this circle refers to the reader’s pre-conceived ideas of the text even when they are reading a sentence for the first time, before a new understanding can be achieved (Gadamer, 2004). In other words, once pre-conceived ideas are made explicit to the reader, they may then re-read the text and be open to new possibilities of understanding. Understanding the relevance of text changes in time from an initial, naïve understanding to developing textual links with other text, cross checking conceptual knowledge or experience (Ricoeur, 1990). Finally, the “aha” moment arrives, and this is the last moment of reading and realisation informing understanding (Ricoeur, 1990). Moreover, if nurses are encouraged, as an experiential learner in the research process, to gain some authority and ownership in their critical enquiry of the text, then it is time to enter an alternate discourse that does not “govern” (Foucault, 1970, p. xiv) like medical discourse, but creates debate. In other words, creating a nursing discourse to supplement, and even transgress the power-knowledge ratio of a HoE framework, is worthwhile.

### *Research methodology*

To measure the efficacy of the Familial model and improve student metacognitive and meta affective reflection, it was subjected to evaluation over two years through quantitative and qualitative evaluation. The study demonstrated students' difficulty in the application of the existing HoE framework and because it favours more empirical forms of research, such as the gold standard RCTs, which marginalise studies based on expert opinion (Guyatt et al., 2011). Furthermore, the students ascribe value to research which is ranked higher in the HoE, but which is less applicable to the questions they are asking about in their clinical practice environs.

The HoE framework was presented as a standard against the complimentary intention of the Familial model as a meta-cognitive/ affective model. Ethics committee approval was granted by the university's ethics committee. A mixed methodology aimed to interpret findings and ensure validity and reliability, while offering an expansive and unconstrained analytical approach (Parahoo, 2014). A three-phase (see figure 3 entitled *Figure 1: Three phase methodology*) approach was initiated, the first collecting the data, the second thematic analysis. First, a focus group of nurse lecturers (team module members, n=5) met to discuss the module evaluations and issues experienced within the delivery of the module. Secondly, a purposive sample was obtained from both EBP modules. With four modules each semester comprising 25 students on average, the total number of students over a two-year period averaged 400 and after sample of n=314 respondents.

Phase 1	Focus group of lecturers (n=5), transcribed and thematically analysed	Focus group interview transcribed and thematically analysed
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Phase 2	Students introduced to the Familial model- comments received anonymously	Comments collected on paper after the teaching session
Phase 3	Purposive sample of students from an online survey using a likert scale (n=314, see table 1)	Qualitative comments from the online survey analysed Thematic analysis and comparison of all data

*Figure 3: Three phase methodology*

In the first phase, students were asked about the HoE framework. This took the form of two comments to which a student could assign an opinion upon a likert scale, which was then subject to standard statistical analysis (Parahoo, 2014). Due to a lack of information available about a complimentary model to help understand HoE frameworks, a likert scale (see Table 2 entitled *Distribution of sample scores*) was used followed by a survey for students to complete (Parahoo, 2014). This approach was adopted because the students had already had significant exposure to the HoE framework throughout the module. In phase 2 of the study students' comments from an online survey were listed and collated. There was value in consciously combining both qualitative and quantitative methods to ensure the accuracy of the study (Parahoo, 2014).

### *Results*

#### *Phase 1*

<b>Likert Scale</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>No Opinion</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
1) I can make sense of the hierarchy of evidence.	144	150	13	5	2

2) I can identify the principles of a hierarchy of evidence in my retrieved literature.	84	79	8	87	56
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*Table 2: Distribution of sample scores (n=314)*

Question 1: Mean=4.49

Question 2: Mean=3.15

Statement of tendency=Regarding statement 1, students showed a tendency to strongly agree. In statement 2, although the students' scores were more distributed, they still demonstrated a tendency to agree.

*Phase two*

In phase two, students were introduced to the Familial model during a module teaching session. The qualitative comments and results from phase two were collated and compared (phase 3) with the quantitative results from phase one and a comparative analysis captured the students' views of the use of each model to emerge. All respondents indicated positive opinion, some examples of which are given below:

*"I like the way that this model focuses on my needs and my ideas, and public health practice, unlike the HoE framework..."*

*"...this model has helped rather than hindered my progress...I like the metaphorical idea of male and female roles within the family, which helped to make sense of how I interpreted research..."*

*"...the Familial model would be really good for planning future assignments"*

*“the model makes all evidence important and gave me permission to include things I would have previously discarded...”*

*“...the Familial model brings to life my academic based research question and links it back to my community nursing practice...”*

*“I particularly like the concept of the ‘mother’ discourse because so often, when you’re writing, there’s that constraint of feeling that your argument has to be ‘born’ in existing reviews and other theoretical and/or empirical material. I really think we are intimidated too much by that culture which effectively stifles originality and creativity.”*

The above statements suggest a straightforward connection with the student and the research-evidence. In the students’ statements, the Familial model implicitly represents the interpretive interplay between the practitioner, the information (text), the educational environment and the clinical practice arena. This feedback provides valuable insight into the needs of health professionals enrolled on an EBP module, and collectively offers a direct relevance to the practitioner in terms of clarity, usage and structure. Although there are things to learn from this feedback it is envisaged that the awareness of the Familial model would lead to continuous improvement in module evaluations. More importantly, referring to the Familial model, students could map their textual understanding of the HoE framework. In all the statements received by the students there was a sense that as health professionals they were defining their own criterion for evidence and therefore being proactive in decision making (Loughlin et al., 2017).

### *Discussion*

The introduction of the Familial model placed the student (the knowing self) back into the centre of the learning experience, rather than at its periphery (Foucault, 2005). Nurses' hold experience and expertise in the practical sense as high value attributes, yet such attributes are discouraged when searching for a pragmatic solution to the real-world problems found in nursing (Murad et al., 2016). The HoE framework is not quite suited to the nursing paradigm, because those types of evidence found near the top of the criterion taxonomy typically require the resources, time and commitment more commonly found in the medical research market (Ou, Hall & Thorne, 2017). Perhaps the most obvious outcome of this study is that post qualifying nurse students need a textual framework in which to place their questions into, organise and interpret the evidence into their clinical background, which the Familial model appears allow. Furthermore, the students' responses identified that they often spent a lot of time "shoe-horning" their ideas into HoE framework, with the impact of eroding the value of their identified clinical issue. In some ways, the students were writing "themselves out" of their own discourses, which reduced the hermeneutic potential for them as students to "know themselves," or challenge their own perceptions/ actions about EBP and practice (Foucault, 2005). This may be acceptable for some scientific disciplines but not for nursing (Rolfe, 2013; Ou et al., 2017), nor in the implementation of practice development innovation for community implementation (Fairbrother et al., 2015), because if the reader is outside of the text, they are likely to discount their own experience and devalue experiential learning (Foucault, 2005). The principle reason for constructing an opportunity for nurses to validate evidence is for them to provide a holistic and balanced response to the complexities of patient care and the best available evidence (Rolfe, 2013).

Perhaps the most positive and unanticipated outcome of this study was the students' response to the model. They revised the Familial model to include their own interpretation of it from a practice-based perspective and the students suggested that the Familial model could embody both a research and a nursing process by suggesting the following in table 3 entitled *Interpretation of the Familial model*.

Research Process	Nursing Process
<ul style="list-style-type: none"> <li>• Mother discourse: the first author's argument from which all ideas grow, acknowledging a temporal process of understanding</li> <li>• Father discourse: attachment texts (Systematic reviews, canonical texts RCTs)</li> <li>• Sister discourse: subsidiary &amp; supporting arguments</li> <li>• Brother discourse: subsidiary &amp; counter arguments</li> <li>• Grandmother discourse: old texts that still hold importance</li> <li>• Grandfather discourse: <i>narrative that keep on generating dialogue and debate</i></li> </ul>	<ul style="list-style-type: none"> <li>• Mother discourse: how to meet a patient's needs – what problems are there to solve?</li> <li>• Father discourse: what current best practice do I attach to this situation?</li> <li>• Sister discourse: what plans, protocols, guidelines support these?</li> <li>• Brother discourse: on what rationale are these protocols etc based?</li> <li>• Grandmother discourse: how are these evolved?</li> <li>• Grandfather discourse: what <i>de facto</i> evidence are these based upon?</li> </ul>

Table 3: *Interpretation of the Familial model*



### *Restrictions of the Familial model*

A limitation of this complimentary model is the dominance of the HoE framework within research, and so we are not suggesting this model is a replacement but expect it to help a reader negotiate the temporal stages of interpretation (Ricoeur, 1990). Once a better understanding is gained, the reader can then refer to the HoE in a non-linear manner, for new meaning (Ricoeur, 1990) and resonance for clinical practice to occur. The limitations of the Familial model relate to the social constructs of familial roles (Flinn, 2006). Experiences of the differing family roles will be individual and have cultural relevance and so we acknowledge the binary, gender stereotypes of labelling attributing gender specific characteristics (Flinn, 2006) The Familial model, in relation to siblings (brother, sister) repeats the subsidiary nature of narrative informing interpretation and acknowledges the hard and soft attributes that make up gender differences, such as the softness of the female form as a metaphor for mothering, and traits nurturing the birth of ideas and understanding (Foucault, 2005). Secondly, the hardness of the masculine (musculature) frame can be used as a metaphor for scientific (quantitative) discourse, such as tone, rigidity and structure complimentary to the female (qualitative) form in the birth of ideas (Foucault, 2005). Perhaps the historical and scientific dominance (so far) of western men naming phenomenon, such as Galileo, Darwin, Freud, may add to the dominance of empirical discourse (Murad et al., 2016).

The structure of nursing world-wide has been and for the most part, is still subordinated by the medical model (Murad et al., 2016), and although nurses must continue to borrow from many disciplines to inform nursing practice, they should also develop a nursing body of knowledge which is promoted with assurance. How the nursing profession does this is by focusing on EBP and nursing care, and not the

medical model used. Best available evidence means considering evidence from a broad perspective, and that includes anecdotal experience, grey literature to meta-analysis and systematic reviews of RCT's (Djulbegovic & Guyatt, 2017). Yet the best evidence available often leads to inflexible implementation that fail to offer individualised patient care or innovation. However, trying to teach a type of interpretive study that includes an interplay of ideas is not easy because there is not always a straightforward connection between the plurality of experience, evidence and education. Therefore, it is important to debate additional ways to organise the relationship between EBP and its implementation.

### *Key points*

In the early stages of learning nursing students are encouraged to think about research through HoE framework. However, it would be more realistic for students to reach their learning objectives by building on what they already know:

- The family is something of which we all have knowledge
- The family is a social structure linked closely by conversation. This is a useful in nursing because experience and knowledge is always viewed as a two-way street
- The HoE framework is drawn from western tradition, the family is cross-cultural
- The Familial model closely follows the principles of the nursing process, prioritising patient needs in a pluralistic, rather than a linear or compartmentalised way

- The Familial model reasserts the author–experience of the student-writer in search of relevant research to inform and be applied into clinical practice
- The complimentary nature of the Familial model may help students to then refer to the HoE framework in a non-linear way, and gain a deeper understanding of EBP relevance to clinical practice

The Familial model achieves a different way of organising research because it allows the nurse to rank evidence from a broader perspective and to be part of an enquiring process which, in turn, informs clinical practice. Most importantly, the Familial model offers the student a stepping stone in the research process.

### *Conclusion*

Post qualifying students' module feedback on an EBP module identified concerns the HoE framework discounted evidence that was lower down the hierarchy which were often of practical use to nurses. For example, students' concerns were reflected in NICE guidelines in relation to the clinical and cost effectiveness of evidence of public health interventions. In response to the students feedback the HoE framework's limited perspective was extended to include a strategic, tactical and alternative textual taxonomy called the Familial model. Findings indicate the model complimented student understanding and practical organisation of their textual interpretations. While it is argued the HoE framework system of rules, and principles of classification allows evidence to be disseminated efficiently, it is a top-down approach inhibiting nurses to exercise control over the rationality of clinical practice. In contrast the Familial model exercises a system of inclusion that not only frames debate but creates it with the nurse as first author, to compliment the HoE framework.

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