Journal of Evaluation in Clinical Practice
International Journal of Public Health Policy and Health Services Research

Journal of Evaluation in Clinical Practice ISSN 1365-2753

DISCUSSION PAPER

Unpacking the process of interpretation in evidence-based decision making

Eivind Engebretsen PhD,[1] Nina Køpke Vøllestad PhD,[1] Astrid Klopstad Wahl PhD,[1] Hilde Stendal Robinson PhD[2] and Kristin Heggen PhD[1]

[1]Professor, [2]Researcher, Health Sciences, Institute of Health and Society, Faculty of Medicine, University of Oslo, Oslo, Norway

Introduction

Evidence-based medicine (EBM) has promoted the conscientious and systematic use of the best available scientific evidence in clinical decision making [1]. From an EBM point of view, only experimental evidence, especially results from randomized controlled trials and meta-analyses of trial results, count as strong evidence. Experiential evidence based upon expert opinion is classified as weak and placed at the bottom of the evidence hierarchy. EBM is often contrasted with traditional clinical medicine which considered pathophysiological reasoning and expert knowledge as the principal sources of clinical decision making. In a recently published article in *Journal of Evaluation in Clinical Practice*, Jeannette Hofmeijer describes EBM as a revision of medical epistemology and points to the neglected role of expert opinion and the lack of focus on the principles of reasoning underpinning EMB [2]. More specifically, she shows how EBM involves important processes of interpretation. Hofmeijer is mainly concerned with the role of interpretation in the production of scientific knowledge within the EBM tradition, and she illustrates how the quest for evidence relies upon interpretation both in formulating a hypothesis and in accepting the accumulated evidence as sufficient. We will argue a related but still different perspective demonstrating the principles of reasoning involved in the *integration* of experimental and experiential knowledge in clinical decisions and the role of interpretation in this respect.

The goal of EBM is, according to Sackett *et al*., the integration of (1) clinical experience and expertise; (2) scientific evidence; and (3) patient values and preferences to provide high-quality services [1]. However, a weakness of EBM is the lack of guidance on how to *combine* the main knowledge components of the model. The EBM literature says little about *how to* create a fruitful interaction between research, clinical expertise and patient preferences. Although the principal aim of EBM is to promote more conscientious and systematic clinical decision making, an important element of the model remains black boxed: the principles of reasoning according to which the different knowledge sources are combined. This paper aims to make explicit the often implicit interpretational work involved when scientific evidence, clinical expertise and patient preferences are combined. We believe that better awareness about this process of interpretation can promote better and more trustworthy decision making.

Lack of individualization is a recurrent criticism against EBM [3,4]. Randomized clinical trials measure average effects and do not necessarily match the local and complex situation of the individual patient [5]. The need for a situated, practice-based reasoning has been argued, and concepts such as clinical intuition [6], tacit knowledge [7], wisdom [8] and collectively defined 'mind lines' [9] have been introduced to challenge a unilateral focus on implementing research evidence. More recently, the literature on patient-centred medicine and shared decision making has emphasized the importance of involving patients in medical decisions and suggested useful methods and approaches [10,11].

In spite of these attempts, the principles of reasoning according to which the knowledge sources are combined and applied are still poorly understood. There are few, if any, models and concepts available which make explicit the *interpretational operations* involved when combining and applying the knowledge components. We intend to throw light on this process by drawing on a four-step model of knowing developed by the Canadian philosopher Bernard Lonergan [12].

What do we do when we know?

Lonergan's topic is the mechanisms of knowing in general and his principal philosophical question is *What do we do when we know?* His aim is to *promote self-awareness* about how knowledge comes about. To Lonergan, this has not only philosophical interest. By consciously attending to what we do as knowers, we can develop our ability to make reliable and transparent judgements.

Lonergan's philosophy is a critique of the hegemony of empiricism and the idea that there is a 'reality already out there now' which science aims to mirror or represent [13]. In Lonergan's opinion, this view underestimates the importance of human intelligence. Objectivity is not a representation of what you observe *but an achievement of the knower*. The quest for insight is the work of active, inquiring intelligence, Lonergan claims. Knowledge is not 'something out there' that you discover but an activity – something that you *do*. This is why Lonergan insists on using the verb 'knowing' instead of the noun 'knowledge' throughout his work.

Furthermore, to Lonergan knowing is not a simple activity but an assemblage of activities. He developed a model describing four levels or stages of knowing: (1) recording of data (sensation); (2) interpretation of data (understanding); (3) weighing of interpretations (judgement); and (4) choice of action (deliberation). This model is, in our view, highly relevant for making explicit what is often left implicit in EBM: the interpretational work through which the three knowledge sources are integrated.

1 Recording of data (sensation)

Every inquiry for knowledge starts with a set of data, that is, something given to our senses. These data do not constitute the knowledge, but they are foundations for questions that may lead to

knowledge and a systematic understanding of the data. Hence, the data are not knowledge, they evoke knowledge. In Lonergan's vocabulary, they are the 'known unknown' [12]. They are something that calls for explanation. Data are the irregularities you feel when palpating the patient's liver, something that calls for your attention and makes you ask 'what could this be?'. Although Lonergan distinguishes between data and knowledge, he still claims that conscious attention to the data is an important part of the knowing process. Awareness is needed in order to recognize all relevant data *as* data and not miss important information.

2 Interpretation of data (understanding)

Understanding is achieved through a process of questioning through which the data are turned into intelligible objects, that is, objects with meaning or 'things'. When the doctor asks 'what could this be?' referring to the irregularities discovered when palpating the patient's liver, the question will probably lead to a description such as 'enlarged with rounded edge' before he continues his interrogation searching for explanations: 'Why is it so? What can be the underlying causes?' No matter the answer to his questions, the doctor's understanding is not directly delivered to him through his fingers but necessitates an active process of cross-examination.

Moreover, the doctor *enriches* the data through his questioning; he adds information in order to make sense of the data. The doctor's questions might be based on other data, for example, the patient's presentation of his symptoms, if he has experienced any pain, etc. Does the patient hold his own opinion about his condition? Does the patient provide information about his lifestyle that might throw light on his condition? However, the doctor's questions will also draw on similar patient cases and what he expects to discover. His questions are attempts to make the new information fit into already acquired schemata of knowledge (*heuristic structures* [12]). Lonergan stresses the importance of using our pre-acquired knowledge *consciously* when we question our data. However, the result of this process of questioning is not a final answer but rather a narrower question, such as 'could this perhaps be a fatty liver?' or 'can malignancy be excluded?'.

3 Weighing of interpretations (judgement)

The next phase is about affirming our interpretation. This implies evaluating whether our interpretation fits the data and in cases where there are *competing* interpretations, which of them fits the most. Lonergan emphasizes the argumentative aspect of this operation: it is an *act of weighing* [12]. For the doctor examining the patient's liver, the judgement implies weighing his theory of a fatty liver against the possibility of malignancy and comparing his interpretation with the data. The judgement is never given but is an active work of intelligence. Thus, by making a judgement, the doctor commits himself to one out of several possible interpretations. The judgement makes the inquirer self-accountable, according to Lonergan. It is about taking the responsibility for one's interpretation and at the same time acknowledging that the interpretation could have been different.

4 Choice of action (deliberation)

This stage involves planning and evaluating possible courses of action based upon the acquired knowledge. Having affirmed his understanding of the patient's condition, the doctor needs to ask: 'What now? What is the optimal treatment or intervention?' Again the doctor needs to raise questions based upon the latest research evidence, the patient's preferences and his own experience with similar cases. However, it is important to note that the doctor here passes from the domain of facts to the domain of values, from what he *knows* to what he *should do*. By insisting that this part of the process is value-laden, Lonergan emphasizes that the decision maker can never lean on guidelines or any other manual in order to defend his decision. The right decision can never be drawn from the facts but is the doctor's individual normative responsibility.

Lonergan's contribution to EBM

What does Lonergan's model add to EBM?

Lonergan's approach supplements EBM's strong reliance on scientific evidence by putting emphasis on the importance of self-conscious questioning. Lonergan underlines the importance of a critical interrogating attitude as opposed to a mechanical use of guideline recommendations or any other data given to the doctor. The evidence can never be simply applied but must be subject to careful and critical questioning.

This also implies attributing a certain open-endedness to the process of inquiry. There is always more to the issue than the doctor can possibly uncover through his investigation. He can never take every symptom, every similar case or every patient utterance into account. Hence, he should investigate the issue as fairly as he can knowing that he will never reach absolute certainty or all-encompassing knowledge.

Furthermore, Lonergan adds to EBM by stressing the importance of self-awareness about the process of merging knowledge. In order to be able to repeat a successful decision, the doctor must attend consciously to the intellectual operations involved. Greenhalgh present the case of Dr. Jenkins who got a call from a mother who said her little girl had diarrhoea and was behaving 'strangely' [13]. Based upon his knowledge about the family, the doctor decided to act quickly, something which turned out to be life-saving since the girl had meningococcal meningitis. According to Greenhalgh the doctor's decision was successful because he intuitively managed to combine knowledge sources instead of using guideline recommendations mechanically. 'This doctor's skill, which would be extremely difficult to measure formally, was to integrate judiciously selected best evidence (e.g. on the prognosis of early meningococcal meningitis with and without the urgent administration of penicillin) with the potential significance of the word 'strangely' and his personal knowledge about this family (their uncomplaining track record, the mother's good sense, and the memory of the child as one whose premorbid behavior had been nothing out of the ordinary)' [13]. Greenhalgh argue the importance of Dr Jenkins's good hunch. However, the problem with a hunch is that it cannot be repeated. According to Lonergan, the doctor should open up the process of intuition rather than simply lean on it, in order to further develop himself as a professional clinician. Firstly, he must acknowledge all parts of the data and be able to recognize them as data and not immediately search for guideline recommendations. The doctor could easily have missed the wording 'strangely' or not taken his knowledge of the family into account. Secondly, the doctor must acknowledge the need for interpretation. This awareness is necessary in order to ensure that the evidence is not used mechanically. Thirdly, the doctor must acknowledge the need to make an individual and situated judgement. He must commit to a particular interpretation

of the data. Last but not least, he must decide on a particular course of action, for example, reorganize his diary, visit the patient immediately, start penicillin treatment without further hesitation. By attending more consciously to these steps, the doctor might have been able to articulate the mechanisms of his 'good hunch'.

Lonergan also emphasizes the importance of self-accountability as part of the process of inquiry. The doctor must take a stand; he must choose from several possible interpretations of the data and commit to one of them. He must also choose a course of action; he must pass from the sphere of facts to the sphere of values. This implies bearing the responsibility for his interpretation and not leaning on any prescribed guideline or manual.

Conclusion

In spite of the ambition to promote more systematic and conscientious clinical decision making, EBM does not offer any systematic approach to the interpretation of the knowledge sources. If the principles of this interpretational work are not discussed as part of the EBM framework, the process and the results of the interpretation are left to chance. The contribution of Lonergan's theory is to make explicit the interpretational work involved in clinical decision making. By unpacking the interpretation involved in integrating the knowledge sources, we might be able to perform this process more systematically and adequately. In addition, Lonergan's model might be used in the medical record as a basis for documenting clinical decisions in order to make the decisions more transparent.

References

1. Sackett, D. L., Rosenberg, W. M. C., Muir Gray, J. A., Haynes, R. B. & Richardson, W. S. (1996) Evidence based medicine: what it is and what it isn't. *BMJ (Clinical Research Ed.)*, 312, 71–72.
2. Hofmeijer, J. (2014) Evidence-based medical knowledge: the neglected role of expert opinion. *Journal of Evaluation in Clinical Practice*, 20, 803–808.
3. Miles, A. & Loughlin, M. (2011) Models in the balance: evidence-based medicine versus evidence-informed individualized care. *Journal of Evaluation in Clinical Practice*, 17 (4), 531–536.
4. Tonelli, M. R. (1998) The philosophical limits of evidence-based medicine. *Academic Medicine: Journal of the Association of American Medical Colleges*, 73 (12), 1234–1240.
5. Kravitz, R. L., Duan, N. & Braslow, J. (2004) Evidence-based medicine, heterogeneity of treatment effects, and the trouble with averages. *The Milbank Quarterly*, 82, 661–687.
6. Greenhalgh, T. (2002) Intuition and evidence – uneasy bedfellows? *The British Journal of General Practice*, 52 (478), 395–400.
7. Thornton, T. (2006) Tacit knowledge as the unifying factor in evidence based medicine and clinical judgement. *Philosophy, Ethics, and Humanities in Medicine*, 1 (2).
8. Hagerty, L. & Grace, P. (2008) Clinical wisdom: the essential foundation of 'good' nursing care. *Journal of Professional Nursing*, 24, 235–240.
9. Gabbay, J. & le May, A. (2004) Evidence-based guidelines or collectively constructed 'mindlines?' Ethnographic study of knowledge management in primary care. *BMJ (Clinical Research Ed.)*, 329, 1013.
10. Elwyn, G., Frosch, D., Thomson, R., *et al.* (2012) Shared decision making: a model for clinical practice. *Journal of General Internal Medicine*, 27, 1361–1367.
11. Stiggelbout, A. M., Van der Weijden, T., De Wit, M. P. T., Frosch, D., Légaré, F., Montori, V. M., Trevena, L. & Elwyn, G. (2012) Shared decision making: really putting patients at the centre of healthcare. *BMJ (Clinical Research Ed.)*, 344, e256.
12. Lonergan, B. (1992) Insight. A Study of Human Understanding. Toronto: University of Toronto Press.
13. Greenhalgh, T. (1999) Narrative based medicine in an evidence based world. *BMJ (Clinical Research Ed.)*, 318 (7179), 323–325.

