Evidence-based medicine in general practice specialty training
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Observations of evidence-based medicine in general practice

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Submitted for publication
Abstract

**Background**  No objective measures are available for the assessment of the actual practice of evidence-based medicine (EBM) in GPs. EBM behaviour in clinical practice concerns the combination of three aspects of EBM (i.e. the evidence, the physician’s experience and preferences and the preferences and situation of the patient) in clinical decision-making. Assessment could help in defining learning needs, directing learners and promoting the development of EBM-curricula.

**Aims**  Firstly, to identify expressions of EBM behaviour by observing general practitioners (GPs) making decisions in clinical practice in order to create an overall view of what EBM behaviour in practice entails. Secondly, to identify which unobservable considerations regarding the three aspects of EBM that contribute to the decision-making process.

**Methods**  In this qualitative study GPs were observed during clinical consultations, with a focus on expressions related to evidence-based decision-making. Directly after the observations, the GPs were interviewed about EBM related considerations that had not been perceived by the observer.

**Results**  We observed a total of 147 consultations held by 34 GPs (17 trainers and 17 trainees). Expressions regarding the use of the aspects of EBM in GPs’ decision-making are scarce. When interviewing the GPs, we found that one or more of the three aspects of EBM more frequently played a role in decision-making but were not discussed with the patient.
**Conclusion**  
EBM behaviour is difficult to observe during consultations of GPs, and therefore cannot be assessed through observations alone. During training, more attention should be paid to the inclusion of the three aspects of EBM in actual practice. A fully explicit consideration of all aspects of EBM would make EBM measurable and GPs more aware of the foundation of their decisions. As a result of increased awareness, evidence would be reconsidered, the preferences of the GP could be re-evaluated and the patients’ preferences will be more explicitly taken into account.
Introduction

The assessment of evidence-based medicine (EBM) in clinical practice often focuses on assessing knowledge and skills in formulating a question, and the searching for and appraising of the evidence.\(^1\) How EBM is used in practice is studied only in terms of the frequency of application of evidence or guidelines, without weighing evidence with regard to the patient’s and the doctor’s preferences and the clinical situation of the patient.

EBM has been defined in varying ways.\(^2\) Sackett and colleagues first defined it as ‘the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients’.\(^3\) Several additions have been made to this definition regarding the incorporation of factors related to the physician and the patient.\(^4-6\) Not only variations in but also different interpretations of the definition of EBM have led to varying ways in which the use of EBM in practice is recognized by physicians, EBM teachers and researchers.\(^7\) As a result, it is unclear how EBM should be taught and practised\(^2\) and how it should be assessed.\(^1\)

The definition of EBM most frequently used is that it is the ‘conscientious, explicit and judicious use of current best evidence, in combination with the physician’s clinical expertise and the preferences and situation of the patient in making decisions about the care of individual patients’.\(^4\) Thus, focusing solely on the knowledge and skills that are required to retrieve and use new evidence results in an incomplete understanding of the full concept of EBM, which is about the integration of evidence, the physician’s experience and expertise, and the patient’s situation and preferences.\(^7\)

Additionally, assessing only the lowest levels of Miller’s Pyramid\(^8\) (‘knows’ and ‘knows how’) does not stimulate the translation of EBM into actual clinical practice.\(^7\) Authentic competence-based assessments\(^9\) are needed in order to identify which knowledge and skills are properly transferred to daily clinical practice, and to stimulate adequate EBM behaviour.
In a recent systematic review, we showed that no objective measures are available for assessing the actual practice of EBM by GPs.¹ Most instruments are self-reported measures (‘Do you practise EBM?’) with little explanation of the underlying concept of EBM. Other studies have focused on the direct application of evidence without weighing clinical experience or patient preferences.¹⁰⁻¹² A few observational studies have been done in practice,¹³⁻¹⁶ but these also mainly focused solely on a single EBM step, such as searching for evidence during patient consultations.¹⁴ The tools for assessing EBM thus focus only on specific components of EBM and do not measure actual EBM behaviour in clinical practice.¹

An integrated assessment of EBM of practitioners in training could help in defining individual learning needs, directing learners to which EBM behaviour is expected in clinical decision making and assisting in the development of EBM curricula.⁷ In order to assess the competences of physicians in practice, sophisticated, robust and multifaceted assessment methods should be used.¹⁷⁻¹⁸ These assessment methods should aim at documenting demonstrated actual performance, in this case the practice of EBM.¹⁹ However, there is no competence-based assessment method for assessing EBM competence in practice.¹ A first step in the development of such an instrument is to define how EBM behaviour can be observed in physicians.

**Aims of this study**

The primary aim of this study was to identify expressions of EBM behaviour in order to create an overall view of what EBM behaviour in practice entails. To do so, we observed GPs making decisions in clinical practice and focused on their use of the three aspects of EBM (evidence, physician’s preferences, and patient’s preferences and situation). The second aim was to identify unobservable considerations that were related to these three aspects and that contributed to the decision-making process.
Methods

This study was qualitative research, in which experienced 17 GPs and 17 GP trainees were observed during clinical consultations in order to study their expressions related to evidence-based decision making. The research was executed among GP trainers and GP trainees allied to the General Practice specialty training programme of the Academic Medical Center, University of Amsterdam (AMC–UvA).

Context

The GP specialty training is a 3-year programme comprising both formal training and training in practice. In their first and third years, GP trainees spend four days a week undergoing training in practice under the supervision of a GP trainer. In their second year, trainees participate in 3- to 6-month clinical traineeships. One day a week, trainees participate in formal education at the training institute. The training is organized according to the CanMeds competencies.²⁰ Besides providing trainees with formal education, the GP specialty training programme also keeps the GP trainers up to date.

Theoretical framework

We explored the literature to determine from which perspective EBM in practice has been examined. We studied literature on the origin of the concept and the definition of EBM in order to develop a theoretical framework and to formulate a comprehensive definition of EBM. The definition as formulated by Dawes and colleagues seemed the most comprehensive, and was therefore used as the concept of EBM in this study. In this definition, EBM is ‘the conscientious, explicit and judicious use of current best evidence, in combination with the physician’s clinical
expertise and the preferences and situation of the patient in making decisions about the care of individual patients’.4

Charles and colleagues stated that EBM can be seen in two ways, namely from the theoretical approach – in which the five EBM steps (ask, access/acquire, appraise, apply, audit)4 play a leading role – and from the practice-oriented approach, in which the combination of the three aspects of EBM (patient, physician and evidence) is of relevance.2 This latter definition can be seen as the fourth and fifth EBM steps: applying and auditing the evidence in patient care. In this study, we focused on this practice-oriented approach of EBM in general practice. EBM behaviour, according to this approach, requires an integration in practice of three aspects: the evidence itself; the physician’s preferences (based on his or her experience and personal expertise);21 and the patient’s preferences (i.e. regarding various treatment options) and clinical and personal situation.3;6;22 We therefore consider EBM competence in practice to entail the clinical decision making during patient encounters in which all three of the abovementioned aspects of EBM are taken into account.

In this study, the focus was on observable behaviour and unobservable considerations regarding EBM (current best evidence, the physician’s clinical expertise, and the patient’s preferences and situation) in clinical practice. Evidence is the current best available information from clinical care research.2 For GPs, the best evidence will usually be in the guidelines. However, when the guidelines do not apply, the current best evidence should be derived, preferably using the five EBM steps.3;4;6 Knowledge of the current best evidence should be considered a prerequisite for the practice of EBM. Physician’s preferences are the ‘proficiency and judgement that has been acquired through experience and practice’.2 These are a combination of the physician’s basic skills and personal experience.6 Patient’s preferences and situation are ‘perspectives, beliefs, expectations and goals for health and life’ and his or her clinical state and circumstances.2;6
Data collection: observations in practice

In preparation for the data collection, four observers (one GP, two epidemiologists and one MD, all of whom are EBM experts) watched a random sample of videoed patient consultations (n=47). During their GP specialty training, trainees videotape patient consultations for research or educational purposes. The observers discussed which EBM behaviour was observable in the video consultations and whether the three aspects of EBM could be identified.

Relevant aspects of EBM derived from the theoretical framework of EBM and the video observations were used to create an observation form containing the following items: patient’s age, gender and clinical problem, policy of the physician, and - the following with free text boxes to record quotations - observed expressions regarding EBM, specified for evidence, the patient and the physician. The form also provided space to record general information about the observed physician and his/her practice.

During the observations, the observers noted all the information relating to the study aims. All expressions of the physician or the patient about each aspect of EBM were written down. Two observers carried out observations in practice. Both observers hold a BSc in healthcare and an MSc in evidence-based practice. Both perceive the concept of EBM as given in the definition of this article. Before starting the observations, the observers reached consensus about the theoretical framework, the aims of the observations and their role during the observations. The number of observations per GP depended on the contents of the consultations. Consultations that included new decision-making were particularly relevant, since the GP had to integrate the aspects of EBM. The role of the observer during the consultations was a non-participating and motive-hidden role: the observer did not interfere with the interaction between the GP and the patient, and in order to preclude socially acceptable behaviour, did not give information about the purpose of the observation.
We selected the study sample purposively, ensuring that we included a broad range of characteristics of GP practices, namely the location of the practice as related to the patient population, the number of GPs in the practice and the gender of the physicians, as we expected that the characteristics of both the patient population and the physicians would influence the manner in which EBM was used in clinical practice. We observed first- and third-year GP trainees and the GP trainers themselves, as we expected that the amount of experience that GPs have influences their expressions of EBM use. Data were presented for the entire GP sample without differentiating between experience or other personal characteristics.

Since the video observations had shown that observing consultations would not provide us with a sufficiently complete view on whether all the aspects of EBM had been considered and the way in which the three aspects of EBM had been combined, we interviewed all the GPs directly after the observations, in order to obtain information about the contribution of the three aspects of EBM to their decisions. The GPs were asked which EBM-related considerations they had made that the observer would not have perceived. Aspects of EBM that had been observed were also discussed with the GPs to verify the validity of the observations and to clarify the meaning of the observed expressions. For instance, when one GP said ‘We know this’, the observer asked: ‘Where do you know this from?’ The role in decision making of aspects of EBM that had not been observed was enquired about. For instance, the observer asked a GP who had not asked the patient about his preferences, to what extent the preferences and situation of the patient had played a role in the decision-making.

*Ethical considerations*

All the GPs gave their written informed consent and were free to refrain from participating in the study. The head of the GP specialty training
programme gave permission to carry out this study. The ethical review board of the Netherlands Association for Medical Education approved of the study (NVMO–NERB number 114).

Analysis of the data

Observations in clinical practice were made until data saturation. Observations forms and data from the interviews were analysed by interpreting the transcripts and then open coding them using the following five steps: sorting out annotations of the observations and preparing them for analysis; creating a rough overview of the identified categories of observations; coding; performing a detailed analysis; analysing outcomes. The analyses were performed by two researchers: a university teacher (MD, PhD, educationalist) in EBM in the GP specialty training programme, and a PhD student involved in this project. Both researchers are EBM experts through research experience and education, and define EBM as stated in this article.

Results

Between February and June 2012, we observed a total of 147 clinical consultations held by 34 GPs (17 trainers and 17 trainees). Of the trainers, 10 (59%) were male. Of the trainees, 5 (29%) were male. The experience of trainers varied from several up to 20 years of training experience. The practices of the observed GPs varied in number of GPs per practice from one to five. All practices are allied to the GP specialty training programme of the AMC–UvA.

We first described the outcomes of the observations of EBM in clinical practice. We then present additional information that was derived from the interviews with the GPs about their decision-making.
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General findings

The consideration and integration of all three components of EBM was observed during only one consultation [25A]. In the majority of the consultations, no arguments regarding the decision-making were given by the GP; information and decisions were stated as facts without explicitly mentioning the underlying considerations on any of the three EBM aspects. When a GP expressed knowledge as a basis for the decision, no differentiation could be made by observation whether evidence or experience was used as the basis for clinical decision-making. The situation of the patient was often explicitly taken into account, although this was mainly restricted to integrating detailed practical choices, such as to which hospital to refer the patient [12D]. The patient was often asked to approve of the proposed decision (‘Do you agree?’).

We observed that the use of the different aspects of EBM depended more on the decision-making style of the GP than on the kind of patient or health problem. For instance, some GPs actively sought evidence during each consultation, while others never did so. And some GPs explicitly included the patient’s situation during all the observed consultations when making a decision, while others did not visibly include the patient's situation in any of the observed consultations. However, there was coherence in how the GPs dealt with high-risk cases (patients in whom chronic or malignant illnesses are suspected) or medical urgencies. In such cases, the suspicions of the GP were generally not shared with the patient as the GP had decided to wait until more information became available [22D, 24C, 27A]. For instance, one GP stated that she did not want to tell the patient the outcomes of her own physical examination until further research had been done regarding the patient’s health [24D].
Evidence

Before the consultations, some GP trainees searched online (Google) for additional information about the patient’s illness, or consulted the guidelines to find information regarding the patient’s clinical problem. The receptionist noted this in the GP’s diary.

During patient consultations, we seldom observed an active look at the evidence to support medical decisions. If evidence was sought, it was easily retrievable evidence, such as that needed for determining required dosages of medication [2.4]. Facts were often presented to the patient without any reference to whether they were evidence-based or experience-based facts. For example, one GP told his patient regarding the use of a nose spray that ‘Some say it works’ [10B]. Only one clear expression made to a patient on available evidence was observed: ‘There are guidelines, which say...’ [28B]. On one occasion, a GP told a patient that she (the GP) needed to search for more information to be able to answer the patient’s question (‘I have to look at my books’) [26B]. Evidence was sometimes used to convince a patient; for instance, one patient wanted anticoagulants whereas they were not indicated (‘There is no evidence that you will live longer’) [17].

GP’s preferences and experience

GPs rarely shared their own preferences or experience with patients. During one observation, a GP clearly expressed his personal preference by telling his patient: ‘My preference is this. What do you think about that?’ [16] GPs did make statements such as ‘I’m 100% certain that you don’t have rheumatoid arthritis’ [7.5]. These kinds of expressions seemed to be derived from personal experience, although this was not explicitly mentioned as such.

When the clinical problem of a patient was unclear, GPs did say that they had inadequate experience to make a clinical decision (‘I don’t know. I’ll
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refer you to a specialist.’). A positive experience with the treatment of problems in other patients resulted in treating patients with the same illness in a similar manner: ‘This worked for another patient …’ [2C].

Patient’s preferences and situation

The patient’s situation was often observed to be considered during the decision making when it was related to prescriptions, for instance by discussing about how much health insurance companies pay towards the costs of various prescriptions [12C], about tolerance to specific medications [12E] or about methods of administration (fluid/gel) [22A]. GPs explicitly included the situation of the patient by saying ‘I know you don’t tolerate that medicine’ [7.5] or ‘With regards to your situation …’ [3.3]. However, the patient’s situation was not always included [11C]; For instance, when a GP advised a plasterer who had knee problems to take it easy despite of his physically challenging work [5.2], without mentioning the clear influence of that advice on his employment.

Discussions of the general pros and cons of treatment options were seldom observed. The expressions on patient’s preferences most often concerned minor details, for instance about what time medication should be taken [12C] or to which hospital the patient wanted to be referred [12C]. If GPs did not agree with the patient’s treatment preferences, they said so: ‘Although I’m not very keen on giving you the medicine, it’s your choice and I’m prepared to prescribe them to you’ [25A]. The GP sometimes included the patient in decision making in order to assure the patient, by making such statements as “If doing nothing makes you nervous, I could prescribe you medication instead” [17] or – without a clear preceding clinical question – ‘I want to assure you that nothing is wrong, so I’ll do this test’ [5.5].

The experience of a GP with a particular patient plays a key role in treatment decisions: if a treatment of that specific patient was successful in the past, GPs are more prone to give the same treatment again to that
patient. For instance, a GP prescribed his patient diclofenac as pain relief, because that treatment had been successful before in that patient [24A]. GPs also regularly verified whether the patient agreed with the proposed treatment, although this did not necessarily mean that the patient’s preferences were taken into account (‘Let’s see then what happens in the next few days’ [20B]).

When a GP was uncertain regarding the diagnosis or treatment of a patient, the patient was explicitly included in the decision-making process seemingly to share responsibility [22D]. In those situations, the patient’s preferences had a prominent influence on the decision-making: ‘What do you want?’ [22D]; ‘What shall we do? You tell me.’ [25C] When a patient had a clear clinical question, including suggestions or a preference for treatment, the GP was generally inclined to follow the patient’s suggestions [21D].

Interviews about the use of EBM in practice

General findings

After each series of consultations, the GP was asked on what arguments their decisions were based. The interviews revealed that GPs do not communicate all considerations to their patients.

Evidence

GPs did not always know the source of the evidence they used. For example, GPs told the interviewer: ‘I think research has been done’, ‘It might be in the guidelines’, ‘Sometimes it’s guessing’ [1.2] and ‘I do not know the source of this’ [12B]. In one case, the GP told the interviewer: ‘There’s no evidence about this’ [3D]. GPs sometimes consciously deviated from the evidence, for reasons related to the situation of the patient (‘We usually give this medicine, but in your case ...’) [16, 26A.] During the
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interviews, several GPs were triggered to look up the evidence [16C, 28A, 29A] and show it to the observer, or even to revise his or her clinical decision.

GP’s preferences and experience

Practical experience and knowledge obtained during specialty training [6.3, 7.3] were often mentioned during the interviews as the basis for clinical decisions. Clinical experience such as ‘A viral infection lasts for five days’ [10C] during the interviews was presented as general knowledge. Although not explicitly mentioned to the patient, the experiences that GPs have had with other patients with similar health problems play a role in decision making: ‘It’s not evidence based, but it does work better’ [14E]. Also, when a GP thought that someone else was better qualified to treat his or her patient because the GP lacked experience or capacities, this was often not mentioned to the patient, but shared with the observer afterwards: ‘I don’t have the illusion of knowing it better than a specialist’ [12D].

Patient’s situation

The interviews showed that the patient’s situation plays a tremendous role in the decision-making process. Factors such as frequency of attendance [12C] or presumed character of the patient (‘She’s a nag’ [17]) were mentioned as reasons for clinical decisions. According to our findings, GPs seem sometimes to base decisions on unverified interpretations and ideas about the situation and wishes of the patient. For instance, before the start of one consultation, the GP said: ‘This patient will get an antibiotic prescription’ [12E]. If a patient was really ill or experiencing difficulties in daily life (22D) – whether or not this was verified by the patient – this was given as a reason to give immediate treatment even when not indicated in the guidelines.
Discussion

In this study we aimed at identifying the observable expressions of the three components of evidence-based decision-making (evidence, physician’s preferences, and patient’s preferences and situation) in clinical practice, and at determining which EBM considerations are not observable but do play a role in decision making in clinical practice.

Our main finding is that observable EBM behaviour is limited, since expressions regarding the use of the aspects of EBM in the decision making of GPs are scarce. Although our study shows that at times one or more of the three aspects of EBM are expressed as the basis for decision-making, GPs mostly do not explicitly use expressions related to the three aspects of EBM during patient consultations. When interviewing the GPs, we found that aspects that we had not observed during the consultations more frequently played a role in decision-making, but GPs do not share with their patients the source of their decisions.

This finding is important for the development and possible use of instruments to assess EBM behaviour or competence in clinical practice. As we now know that expressions indicating EBM behaviour are scarce in both experienced GPs and GP trainees, a first discussion should be about the behaviour that we expect from physicians, and the possible consequences of this expected behaviour for the patient, the physician and the educational system.

When aiming for patient-centred medicine and true shared decision making, as is currently advocated in medical literature a fundamental step in this process is to share the relevant information between doctor and patient and to reach consensus on a decision. This implies that we expect physicians to actively share evidence, experience and preferences with the patient and to discuss the patient’s situation and preferences. However, this approach is mainly applicable in situations in which there is a debatable trade-off between benefit and harm, or significant effort on the part of the patient is required for a successful result.
One could question whether this approach is feasible during the short time available for GP consultations (10 minutes). Fortunately, most GPs know their patients, their patients’ families and their patients’ living situations very well. In this, the advantage for the GP is that interventions can more easily be adjusted to the patient, without discussing all the considerations at every moment. This could, however, also be a pitfall, because in this study we found that the patient’s preferences and situation were not always checked. Elwyn and colleagues confirm that GPs generally do what they consider to be best for the patient without explicitly including the patient’s preferences.\textsuperscript{26}

In addition, research into whether patients actually want to be included in decision-making is conflicting: some studies conclude that patients want to be included,\textsuperscript{27} whereas others conclude the opposite.\textsuperscript{28-29} However, all these studies agree that patients want to have more information about their illness and treatment.\textsuperscript{28-29} Barry and colleagues stated that not fully informing the patient can result in treating patients - had they been fully informed - would not have wanted treatment.\textsuperscript{27}

We found a specific situation in which the patient’s preferences were not considered, namely when the patient required immediate medical care. Barry and colleagues also stated that patient preferences are of limited value when ‘one superior path’ has to be taken to treat the patient.\textsuperscript{27} In that case, only the patient’s situation is to be integrated into the decision-making.

The observed GPs often indicated that the evidence used was derived from the guidelines. However, GPs frequently did not know the source of the evidence. This finding is confirmed by a study by Gabbay and colleagues, who found that tacit knowledge is also incorporated into the use of EBM.\textsuperscript{30} Subsequently, it could be unclear to GPs whether their knowledge has been derived from experience or from previously acquired evidence;\textsuperscript{30} if that is the case, they could be uncertain about whether their knowledge is up to date. Sharing their considerations regarding evidence, experience and the patient’s situation with their patients could enhance
the physicians’ reflection on the knowledge used and its critical application and make GPs more aware of the foundation of their decisions.

Since EBM behaviour is currently rarely visible in practice, it seems hard to assess EBM competence by practice observations alone. GP trainees could be stimulated by means of training and assessment to express their considerations regarding decision making during patient consultations whenever such is possible. To do so, they should be trained then in shared decision making and stimulated to reflect on their decisions. An additional advantage of such an approach would be that it allows their EBM competence to be assessed. A first step in adapting education would be to teach GPs what EBM behaviour entails – in conformity with the definition given in this article and using the three aspects – and what competences are needed to accurately apply EBM in clinical practice. The second step would be to develop EBM competence assessment in order to evaluate the use of EBM in practice. According to Leung, the advantage of competence-based assessment is that training, if applied correctly, can be individualized and transparent and can harvest shared accountability. The assessment’s predictive value and formal educational role are also considered important. Regarding EBM, this will stimulate GPs to use all the aspects of EBM, to reflect on how they practice EBM, and to find an optimum balance between explicit and implicit use of EBM.

Strengths and limitations

This study was the first to observe the aspects of EBM in clinical decision making during patient encounters. There were some limitations to the execution of this study. First, although the study sample comprised a diverse selection of GPs and we obtained information until data saturation occurred, the outcomes of this study may not be applicable to the average GP, that is, to GPs who are not allied to an academic institution. GP trainers and trainees receive supplementary education and may have a special interest in EBM. However, as the purpose of this study was to explore all
the possible expressions of EBM behaviour and as data saturation was reached, we do not believe that the inclusion of this population led to the observation of different expressions of EBM.

The second limitation is the generalizability of this study. This study was executed in the Netherlands. We found that evidence was seldom explicitly explained to patients, and this – or taking the preferences of the patients into account – may be different in other countries. Our findings may have been influenced by culture: the healthcare system, or the habits of GPs or observations made in GP practices in other countries may reveal different expressions.

The last limitation concerns the possibility of social desirability bias during the interviews after the purpose of the study had been revealed to the participants. Their answers could have been influenced by the feeling that the observers expected these answers, while in fact the considerations given played no role in the decision making process. This was partly prevented by first performing the observations without explaining the study aim to the participants.