Evidence-based medicine in general practice specialty training
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General Introduction
Background

Medical knowledge rapidly evolves, expands and even replaces itself. Every year the speed of generation and dissemination of new evidence rises due to the use of new media and increased possibilities of information and communication technology. The resulting information overload makes it almost impossible for physicians to fulfil their ethical duty to keep up to date with current best evidence. Medical education in the last decades has accordingly changed from an authoritarian-based training programme, to a programme focusing on the competencies required for life-long, self-directed learning and critical use of new information. Evidence-based medicine (EBM) was even proclaimed by some to be the new paradigm for medical education.

EBM is the translation of the results of clinical epidemiological studies into daily medical practice. The contemporary definition states that EBM is the conscientious, explicit and judicious use of current best evidence in combination with the physician’s preferences, the patient’s preferences and the situation of the patient in making decisions about the care of individual patients. Depending on the medical speciality, EBM has been more or less integrated into the daily practice of medical specialists. The uptake of EBM by General Practitioners, however, remains the subject of debate. Although GPs generally agree that the practice of EBM can improve patient care, they also experience specific barriers to the use of EBM in their practice. In a focus-group study among Belgian GPs for instance, GPs stated that their decision-making is mainly based on intuition, habits and experience instead of evidence. Additionally they feel the patients’ symptoms are often too vague and the problems faced too broad to practice EBM. They say that for their specific specialism a continuous scientific update is not feasible. The specific GP setting therefore has a significant influence on the actual use of EBM by this group. These results have been confirmed by a recent study among Dutch GP trainers, in which trainers stated they considered EBM an academic quality, not generally
related to daily General Practice. Most of them, however, do feel that the use of guidelines is important for GPs. Differences in the interpretation of the definition of EBM seems to be one of the causes of these seemingly opposite expressions.\textsuperscript{12}

The difficulties experienced by General Practitioners in using EBM combined with the attitude of GP trainers, acting as role-models for GP trainees, potentially have a strong influence on the future practice of EBM by trainees.\textsuperscript{13} To enhance the future use of EBM by trainees, a combination of train-the-trainers programmes and optimal formal education on EBM for GP trainees is important. In this thesis I am focusing on the learning of EBM by GP trainees and on the assessment of EBM in GP specialty training.
Figure 1. Clinical Decision Making (Adapted from Offringa M, et al.)
General Practice in the Netherlands

In the Dutch healthcare system, GPs have an important function as gatekeepers. All Dutch citizens are registered in a GP practice and – except from medical emergencies – first visit their GP when they require medical care. Approximately 96% of all the consultations are performed by GPs without interference of other healthcare professionals.\(^\text{15}\)

Dutch GPs frequently make use of the guidelines (99 at present) of the Dutch Society of General Practitioners to find an answer to their clinical questions.\(^\text{16}\) GPs generally show a positive attitude towards these guidelines\(^\text{17}\) and 66% of the decisions made by Dutch GPs are in accordance with the guidelines.\(^\text{18}\) According to the hierarchical pyramid described by Haynes et al. showing the scientific value of evidence resources (figure 2), these guidelines can be considered as the highest level of evidence available to GPs.\(^\text{19}\)

![Pyramid of evidence](image)

**Figure 2. Pyramid of evidence\(^\text{19}\)**
However, not all clinical questions can be answered with the use of guidelines,\textsuperscript{20} in which case sources with lower levels of evidence must be used. When no evidence that falls within the pyramid is available, experience and expert opinion are also often used by GPs and count as ‘best available evidence’.\textsuperscript{21}

**EBM in the GP specialty training**

The GP specialty training is a 3-year educational programme combining training in clinical practice (4 days a week) with one day of formal education at the training institute. Since the emergence of clinical epidemiology in the early 1980s, education in EBM has become embedded in medical teaching.\textsuperscript{4} Medical trainees learn how to keep up with the growing pile of information and also how to assess and apply the information found. In the GP specialty training programme of the Academic Medical Center of the University of Amsterdam, EBM plays a prominent role: attention is paid to the knowledge and skills that are necessary for the application of evidence and for dealing with guidelines. As in most medical training programmes, training in EBM takes place according to the 5-step model.\textsuperscript{4,7}

1. Translation of a clinical problem into an answerable question (ask);
2. Efficient search for the best evidence to fit the question (access/acquire);
3. Appraising the evidence found regarding methodological quality and applicability for the patient - assessment of internal and external validity (appraise);
4. Making a decision in respect of available evidence, preferences and experience the GP and preferences and situation of the patient (apply);
5. Regular evaluation of the quality of this process (audit/assess).
These 5 steps are to be used by GP trainees when facing a clinical question for which new or additional information is needed in order to answer these questions accurately. The EBM steps are used less explicitly when managing patients with more common clinical problems, since the GP trainee is already familiar with the policy regarding these problems.

Thorough education in EBM is thus given in the GP specialty training. The main purpose of this formal training in EBM, however, is for the acquired skills to be applied when caring for patients in clinical practice. Multiple aspects influence the transfer of these EBM competencies to the clinical workplace of the GP trainee. The learning style of the trainee, barriers regarding practice of EBM in the specific GP setting, and the assessment of the required competencies are three of these aspects, which are discussed in this thesis.

*Learning Style*

As formal postgraduate education in EBM is generally not adapted to the individual learning needs and methods of the trainees, the learning styles of trainees could influence the uptake of the knowledge and skills as presented in formal education in EBM. Additionally, preferred ways for acquiring new information during formal education (learning style) could be related to the methods used to solve patient problems (EBM or otherwise), which also requires obtaining and integrating new information. Chapter 1 therefore describes the outcomes of a study regarding the knowledge/skills, attitude and self-reported behaviour of GP trainees regarding EBM.
Barriers towards the practice of EBM

We know that barriers exist, limiting the use of EBM by trainees. In a recent systematic review by our group it was shown that time, attitude, knowledge and skills, and specific barriers related to the position of trainees of various specialties limit their use of EBM in clinical practice.\textsuperscript{23} As speciality-specific barriers have also been mentioned in general practice, we performed a systematic review of the barriers experienced by GPs, in order to obtain a complete view of the barriers potentially limiting the use of EBM by GP-trainees (\textit{Chapter 2}). Based on the results of these systematic reviews, a questionnaire was developed to assess the barriers as experienced by Dutch GP trainees (\textit{Chapter 3}).

Assessment

As assessment is one of the most potent influences on learning, the format and content of the assessment of EBM competencies in GP trainees could significantly influence their learning.\textsuperscript{24} Valid assessment tools are a first requirement to stimulate learning in this area. A recent systematic review showed that two instruments exist that validly identify EBM knowledge and skills of medical professionals.\textsuperscript{25} \textit{Chapter 4} describes the translation and subsequent validation of one of these tools: the Berlin questionnaire.\textsuperscript{25} Assessment can, however, take place at various levels of learning. The four levels of Miller’s pyramid of learning describe these potential learning outcomes (Figure 3).\textsuperscript{26} In line with the ideas on competence-based education, ideally the top of the pyramid is reached in learning: trainees show the desired behaviour in daily clinical practice. In EBM, usually only the lowest two segments of the pyramid (knows/knows how) are taught and assessed.\textsuperscript{26-27}
In order to assess EBM behaviour in practice at the highest levels of the pyramid, assessment tools are needed. **Chapter 5** contains the results of a systematic review investigating whether valid assessment tools exist for the practice of EBM. As we concluded that no instruments exist that provide an integrated overview of EBM competencies in clinical practice, and also that no overview exists of expressions of competent EBM behaviour, **Chapter 6** describes the results of an observational study on EBM-behaviour in clinical practice. The results of this study can be used as a starting point for the development of new assessment instruments for this competence.