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

Evidence-based medicine (EBM) – defined as the conscientious, explicit and judicious use of current best evidence in combination with the physician’s experience and preferences and the patient’s preferences and situation, in making decisions about the care of individual patients¹⁻⁴ – has become the cornerstone of medical education programmes. However, the uptake of EBM knowledge and skills and the transfer to the clinical workplace of the principles of EBM as learned during formal education, remain hindered by various barriers⁵. For this thesis, I studied the learning and assessment of EBM in GP trainees’ education.

Main findings

We found that the EBM knowledge and skills of GP trainees at the start of their specialty training are comparable to the knowledge and skills of GP trainers.⁶ We also found that the attitude of GP trainees is rather positive and comparable to the attitude of experienced GPs,⁶⁻⁸ and that learning style is not related to EBM knowledge, skills or attitude.⁸ Although a minimum required level of knowledge, skills and attitude to adequately practice EBM has not yet been established, and is dependent on the level of training and specialisation of the learner, the skills and knowledge in EBM of GP trainees starting their specialty training currently seems sufficient. When applying EBM in clinical practice, however, both experienced GPs⁹ and GP trainees¹⁰ encounter a significant number of barriers, as do trainees from other specialties.⁵ Stimulating the application of EBM in daily practice therefore seems in order.

One factor that strongly influences the learning of knowledge and skills during formal education and their transfer to clinical practice, is the method of assessment.¹¹ Many tools are available to assess particular aspects of EBM.¹² One such tool – the Berlin questionnaire¹³ – tests EBM knowledge and skills related to authentic cases commonly encountered in
GP practice. As we expected these authentic cases to motivate learners, we translated the Berlin questionnaire into Dutch and subsequently validated the translated questionnaire for use in the Dutch GP trainee setting.

The most powerful means for changing the practice behaviour of learners, however, is competency-based assessment in the workplace. Particularly for EBM education, the assessment of EBM in clinical practice could play an important part in defining individual learning needs, in indicating to learners what EBM behaviour is expected in clinical practice and in developing EBM curricula. In order to identify a proper tool for the assessment of EBM competency in practice, we performed a systematic review. This review revealed that there is no valid and reliable competency-based tool with which to objectively assess the full concept of EBM in clinical practice, which would be the most powerful stimulation for proper EBM behaviour.

To develop such an instrument, we first observed GPs and GP trainees and found that observable expressions of EBM behaviour are limited. By interviewing the observed GPs, however, we found that their considerations during decision making often contained aspects of EBM behaviour (combining evidence, the physician's experience and preferences, and the patient's situation and preferences) that were not expressed during consultations.

Consequences for education

The most important question for education resulting from this thesis is: ‘What EBM behaviour do we expect from GP trainees and other learners?’ As long as the answer to this question - including concrete learning goals - remains unclear, trainees will not be motivated to learn or practice EBM.

The expected EBM competencies of Dutch GP trainees have been described in the ‘Competency profile and final requirements of the General Practitioner’, which lays down the competencies a GP has to acquire
through education according to the CanMeds Framework.\textsuperscript{20} Within the competency area ‘Science and Knowledge’, it is stated as a general requirement that a GP trainee ‘should be able to sensibly apply medical interventions that are suitable in a particular situation considering clinical evidence, experience and/or circumstances, to evaluate the effect of these interventions and to make a subsequent decision for the continuation of care’.\textsuperscript{19} In this, the integration of the various aspects of EBM is well described.

However, when looking at the expected behaviour as described in concrete competencies, the final requirements and the educational programme and assessment as formulated in the competency profile, the focus is on the knowledge and skills needed to acquire new evidence and not on the integration of evidence with the other components of EBM. It is essential that both during their formal education and at the workplace, trainees obtain an adequate perception of what EBM entails and are stimulated to practice EBM (integrating evidence, experience, own and patient preferences, and patient situation) during clinical consultations. Searching for evidence and critical appraisal will, of course, remain important factors in acquiring clinical evidence, but on their own they are insufficient. The development of adequate assessment instruments is an important prerequisite to accomplish this.

An important side-effect of a more prominent focus on the use of all aspects of EBM in clinical practice, could be that GP trainees learn to reflect upon their EBM behaviour and thus on the factors that determine their clinical decision-making. Another important factor influencing the EBM behaviour of trainees is the role-modelling by the GP trainer. In their first year of training, GP trainees have a relatively positive attitude towards EBM, while 2.5 years later their attitude is less positive.\textsuperscript{10} This could be partly due to their personal experience with EBM in general practice, on which the GP trainer, as role model, has a large influence.\textsuperscript{6,22} Deploying positive role models during both formal and workplace-based education is one way to influence the attitude of trainees. Training GP trainers and
tutors in the basics of EBM and making them aware of their influence as role models in this area could therefore have a considerable influence on the future EBM behaviour of our trainees. The studies by Ria Jochemsen-van der Leeuw on the role modelling of GP trainers\textsuperscript{21,22} and those by Ellen te Pas on a blended learning programme for GP trainers,\textsuperscript{6} provide the first steps in this direction.

**Implications for future research**

The same question that arises for education in EBM also arises for research on EBM, namely: What behaviour do we expect from healthcare professionals? Do we expect at least one question to be formulated after every consultation? At least one search in PubMed per day? The methods currently used to evaluate the EBM behaviour of healthcare professionals – such as the number of questions formulated or searches performed – result in a distorted image of the actual use of EBM according to its definition, and thereby do not stimulate adequate EBM behaviour. To overcome this, consensus must be reached on what EBM behaviour we expect from which professional. We have taken a first step by studying whether and, if so, what EBM behaviour is observable in daily practice, while keeping the full definition of EBM in mind.\textsuperscript{1,4} A second step would be to determine what behaviour is required from healthcare professionals when using EBM and is still feasible during daily clinical practice.

Requiring physicians to clearly express all their considerations when aiming for an evidence-based decision would make EBM behaviour highly assessable; however, such a requirement may not be feasible. For instance, in our observational study we showed that GPs do not always know the source of their knowledge, that is, whether it is based on evidence, experience or expertise.\textsuperscript{18} This may be because a significant amount of information is stored as tacit knowledge.\textsuperscript{23} As a result, it might be very difficult for GPs to express whether their knowledge has been derived from experience or from previously acquired evidence\textsuperscript{23} and whether it is up to
date. On the other hand, a critical reflection on the origin of knowledge could enhance the quality of practice by encouraging GPs to review existing guidelines or search for new evidence.

Second, whether it is desirable for patients to be aware of all the considerations a physician has and who should make the evidence-based decision are matters of debate. In several studies, patients stated that they wanted more information from their physicians, but that they do not always want to be included in the decision making.\textsuperscript{24,25} Others, however, stated that patients or patient and doctor together should make all the decisions based on the information presented by the physician.\textsuperscript{26,27}

Thus, what could be the required EBM behaviour of healthcare professionals is influenced by multiple aspects, including the feasibility of the behaviour. A Delphi study that includes educational experts, medical experts and patients could be a suitable method to develop criteria for adequate EBM behaviour and criteria in this Delphi study could be based on the findings of our study\textsuperscript{18} and of other studies.\textsuperscript{5,9} Based on those results, instruments to assess EBM behaviour for research and educational practice could be developed and validated, and the influence of the implementation of these tools on the behaviour of professionals and learners could be studied.

As an alternative to assessing EBM behaviour in daily practice, the use of objectively structured clinical examinations (OSCEs) as assessment tools could be studied. The advantage of an OSCE assessment is that the contents of the assessment could be organised around specific clinical questions adapted to, for instance, GP trainees. The disadvantages of OSCEs are an increase in socially acceptable behaviour – which requires particular attention to be paid to the development of the method of assessment\textsuperscript{28} – and the amount of time and the costs that these types of assessments require.\textsuperscript{29}

On a more individual level, the development of EBM competency is probably related to the personal characteristics of learners. Although we found no relation between learning styles and knowledge, attitude and
self-reported behaviour of EBM, other factors may be of interest in this area. For instance, the educational setting influences learners’ motivational beliefs (i.e. self-efficacy, task value and goal setting) about their competencies. These motivational beliefs are related to learning performance and achievements.

To assess whether there is a relation between task value and self-efficacy regarding EBM and EBM knowledge and skills, we performed a pilot study among medical students. In this pilot study, no correlation was found between these two aspects of motivational beliefs and EBM knowledge and skills, but as this was a small sample and goal setting was not studied, further studies in this area could be performed. Other personal characteristics related to learning, motivation and transfer could also influence the development of EBM competencies and their transfer to the clinical workplace, and could be a basis for the development of more individualised educational interventions, thereby increasing the future use of EBM in clinical practice.