A systematic review of UK undergraduate medical education in general practice

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Other members of the team:

- Dr. Nada Khan (UCL Research Assistant. Experienced systematic reviewer)
- Prof Mandy Hampshire (University of Nottingham. Previous experience conducting Cochrane Systematic reviews and experienced Primary Care Medical Educator)
- Dr. Richard Knox (University of Nottingham. Experienced Primary Care Medical educator and education research)
- Dr. Alice Malpass (University of Bristol. International expert in using meta-ethnographic syntheses of qualitative literature).
- Dr. James Thomas (Institute of Education. Experienced systematic reviewer + Epip-centre team) – involved particularly in Text Mining Pilot during title and abstract screening.
- Betsy Anagnostelis (UCL Head Librarian) – bibliographic database search development and citation screening.
- Dr. Mark Newman (Institute of Education. Reader. Experienced member of Epip-centre team). Will contribute to steering group and statistical analysis.

Steering Committee:

- Dr. Peter Bower (University of Manchester. Highly experienced health services researcher including Cochrane Systematic Reviews)
- Dr. Carl Heneghan (University of Oxford. Reader in Evidence Based Medicine and Director of the Centre for Evidence Based Medicine. Conducted BEME journal club review).
- Prof Steve Iliffe (UCL. Experience conducting and supervising range of qualitative and quantitative systematic reviews in primary care).
- Dr. Elizabeth Murray (UCL. Experience conducting meta-analyses and meta-syntheses and expert in primary care educational research).
- Dr. Joe Rosenthal (UCL. Head of Teaching Chair for Society of Academic Primary Care teaching group and Sub-Dean for Community Based Medical Education at UCL Medical School).
- Medical student (Zoya Georgieva) and patient representatives (Amanda Band).

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1. Background to the topic

General Practice has become an increasingly popular learning environment within undergraduate medical education. In the UK, most medical schools now deliver between ten and fifteen percent of the undergraduate curriculum in the primary care setting at an estimated cost of £100 million per year. Following the publication of the third edition of Tomorrow’s Doctors in 2009, many medical schools have made plans to expand their involvement further.

Empirical research has been carried out in this setting, usually with minimal or no funding; in single institutions; and consequently small scale (1, 2), making conclusions difficult to apply beyond the individual institution (3). There has been a systematic review of US community-based medical education (4), a BEME review of how early experience in clinical and community settings can contribute to medical education (5), and an unpublished GMC commissioned review by Paul Dieppe and colleagues exploring the relationship between medical education providers and placement providers. As yet, no systematic review has addressed the learning context of general practice for undergraduate medical students in the UK.

A large amount of time, money and effort are invested by medical students, educators, patients and regulatory bodies to ensure that medical education provision is of the highest possible quality. This quality can be conceptualised and explored through a number of ways including immediate and more long-term effects upon medical students, teachers, patients, practices and organisational colleagues and counter-parts, such as hospital colleagues. Bringing together and understanding the existing research literature in this field will help inform, shape and maximise the benefits of teaching and research in this field in future.

2. Review topic/questions, objectives and keywords

The aim of this project is to identify, summarise and synthesise empirical research evidence on delivering undergraduate medical education in general practice in the United Kingdom. This review will maximise the impact of existing research to inform current policy and plans for curricula development and patient care. It will also tell us what is and is not known within the existing empirical literature, allowing us to shape the future agenda for research in this area.

The main review questions are as follows:

1. What learning activities have been reported to happen in undergraduate general practice teaching in the United Kingdom terms of:
   a. Learning objectives and content?
   b. Duration, structure and timing of placements?
2. Which professional groups are involved in teaching undergraduate medical education in general practice?
3. What learning and practice outcomes have been demonstrated for students, teachers and patients in the domains of cognitive; behavioural; and emotional change or learning as a result of undergraduate placements in general practice?
4. What do students, teachers and patients perceive to be the benefits and dis-benefits of undergraduate medical education in general practice?
5. What are the theoretical and conceptual underpinnings of placements and which ‘active components’ have been described or evaluated within the empirical literature?
6. What are the costs of undergraduate teaching in general practice?
   a. We are not undertaking a formal cost-benefit analysis, but will collect data on financial costs where available and relevant within the studies included in the review

3. Search sources and strategies

In order to identify all the relevant literature, we have searched electronic bibliographic databases including MEDLINE; EMBASE; CINAHL; PsycInfo; ERIC; the British Education Index (BEI); and
the Australian Educational Index (AEI), including literature from the inception of each database to March 2013. We have also searched the Index to Theses and Dissertation Abstracts, and have included any relevant dissertations.

The final MEDLINE search strategy is shown in Appendix 1. Because the focus of this review is UK-based undergraduate medical education, we have restricted the searches to studies geographically conducted within the United Kingdom and written in the English language. Our initial search has resulted in 12477 records which were entered into the title and abstract screening stage.

Our initial searches identified 12477 records which were entered into the first stage of the review for title and abstract double screening by two reviewers. A preliminary flow chart of the literature search results is shown in Figure 1.

Figure 1: Preliminary flow chart of literature search results

We will also conduct forward citation screening, related reference screening and hand searching of three key journals (Medical Education, Family Medicine and Academic Medicine) which were shown to publish highly relevant studies during previous pilot searches. We will also screen titles of theses from the ProQuest Dissertation and Theses, and included relevant UK based theses in the main database.

4. Study selection criteria

Types of intervention

Undergraduate medical education in general practice in the UK. These might be of any length, but must be delivered in the general practice setting. Within general practice, teaching could be delivered by a range of staff including general practitioners, other healthcare professionals, patients or peers. Teaching by GPs in other contexts such as the university or hospital setting, will not be included in this review.

Types of studies

All empirical studies with primary data collected within the United Kingdom will be included. Suitable methodologies will include: randomised controlled trials; cohort studies; case control; before and after studies; interrupted time studies; economic studies; and qualitative studies. Studies with new primary data (e.g. reviews) will not be included, but may be used as a source of identifying empirical studies.
Types of participants
Medical students, teachers and / or patients in general practice settings. Medical students will be defined as ‘students undertaking a course of study at a medical school in order to reach a primary qualification in medicine, enabling them to practise as doctors’. These will be referred to as ‘undergraduates’, although we intend to include courses which offer the opportunity for graduates of other degrees to study for a medical qualification. Learning will be defined as a socio-cultural process involving a range of possible knowledge acquisition including behavioural, emotional or cognitive development.

Setting
This review is being conducted to inform teaching and policy development in the UK setting. We will use the well-recognised characteristics or definition of ‘general practice’ developed by WONCA Europe as a definition of ‘Family Medicine’ and also recommended in the RCGP Curriculum Introduction and User Guide (6). These characteristics of the discipline of general practice relate to eleven abilities recommended for every family doctor to master, and as the basis for developing the curriculum for training in general practice:

“General practice:

- is normally the point of first medical contact within the healthcare system, providing open and unlimited access to its users, dealing with all health problems regardless of the age, sex, or any other characteristic of the person concerned;
- makes efficient use of healthcare resources through co-ordinating care, working with other professionals in the primary care setting, and by managing the interface with other specialities. It also means taking on an advocacy role for the patient when needed;
- develops a person-centred approach, orientated to individuals, their family and their community;
- has a unique consultation process, which establishes a relationship over time through effective communication between doctor and patient;
- is responsible for the provision of longitudinal continuity of care as determined by the needs of the patient;
- has a specific decision-making process determined by the prevalence and incidence of illness in the community;
- manages both the acute and chronic health problems of individual patients simultaneously;
- manages illness which presents in an undifferentiated way at an early stage in their development, some of which may require urgent intervention;
- promotes health and well-being by both appropriate and effective intervention;
- has a specific responsibility for the health of the community; and
- deals with health problems in their physical, psychological, social, cultural and existential dimensions.” (6)

During the title and abstract screening process, we are piloting a ‘text mining’ technology within eppi-reviewer. Text mining aims to identify relevant records in systematic review searches in order to improve reviewing efficiency. The text mining technology is embedded within eppi-reviewer, and involves techniques such as automatic term recognition and clustering of relevant articles. These techniques can help improve reviewing efficiency through early identification of relevant items and increasing precision of searches. The relative sensitivity and specificity of traditional double-screening systematic review approaches and text-mining in identifying the final set of included papers will be explored (7).

Exclusion criteria at title and abstract screening phase
Citations identified by the bibliographic database searches have been loaded into the eppi-reviewer software, enabling us to organise and share our review. Review authors will independently double screen titles and abstracts for relevance using the agreed criteria (Table 1). The criteria will be applied in descending order.
### Table 1: Exclusion criteria at title and abstract screening phase

<table>
<thead>
<tr>
<th>1. Exclude - duplicate</th>
<th>De-duplication has been conducted within eppi-reviewer using 85% fuzzy logic function, then by hand.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Exclude - research not conducted in United Kingdom</td>
<td>These may, however, be published elsewhere using e.g. US terminology.</td>
</tr>
<tr>
<td>3. Exclude - item not written in English</td>
<td>We do not have adequate resources to translate relevant papers in enough detail for the synthesis approaches planned. We anticipate that the majority of UK-based studies will have been published in the English language.</td>
</tr>
<tr>
<td>4. Exclude - learners not medical students</td>
<td>e.g. other disciplines, pre-registration / foundation, postgraduate trainees, residents, interns or qualified healthcare professionals</td>
</tr>
<tr>
<td>5. Exclude - learning not in general practice setting</td>
<td>e.g. hospital or university institutional setting</td>
</tr>
<tr>
<td>6. Exclude - topic not medical education</td>
<td>e.g. health services research not related to undergraduate medical education; career studies if not specifically exploring impact of undergraduate general practice teaching on career trajectory / choice etc.</td>
</tr>
<tr>
<td>7. Exclude - does not include empirical data</td>
<td>i.e. must include a ‘method’. A broad range of both qualitative, quantitative and mixed methods are acceptable for inclusion. Editorials or commentaries would not be included. Quality assessments for each method will be carried out for each synthetic approach as appropriate.</td>
</tr>
<tr>
<td>8. Exclude - does not include primary empirical data</td>
<td>e.g. systematic or literature review. May, however, be used for citation checking.</td>
</tr>
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Papers included at the title and abstract screening phase will then be screened on the basis of the full-text using the same criteria listed in Table 1.

### 5. Procedure for extracting data

We have developed a data extraction form based on the BEME coding form used by Dornan et al with additional input based upon guidance from the Cochrane Consumers and Communication Review Group (5). The form will be piloted on included studies and iteratively refined using batches of included papers until we are satisfied that the form adequately captures all necessary data.

### 6. Synthesis of extracted evidence

**Descriptive narrative synthesis**

The first stage in the synthesis of the included studies will be a narrative synthesis describing the types of learning placements in terms of numbers of students; duration of placements; location in curriculum; learning aims and objectives; learning content and methods; and methods of assessment. We will also describe the range of evaluative methods used in terms of who undertook the evaluation; date of study; methodology used; likelihood of bias; and main findings. This descriptive synthesis will form the basis for focusing more sophisticated analyses below.
Meta-analysis
Meta-analysis is a well described technique for combining quantitative outcomes from a number of studies. Our initial descriptive synthesis will facilitate assessment of content heterogeneity, methodological heterogeneity and heterogeneity in types of outcomes, allowing a determination of whether formal meta-analysis is possible and appropriate. The quality of included papers will be assessed using a CASP tool. These decisions will be reviewed at a data clinic. We will follow the Cochrane guidance for undertaking meta-analysis. Relevant data will be analysed within eppi-reviewer to enable meta-analysis. The PI, NK, SP and RK will be supported in doing this meta-analysis by MN (including statistical advice), MH, EM and PB. We will undertake sensitivity analyses of high and low quality studies to explore the robustness of our findings. Data on unintended adverse outcomes attributable to the intervention will be combined statistically where possible (reporting separately behavioural, emotional and cognitive adverse outcomes). We will present and discuss our findings by type of outcome (behavioural, emotional and cognitive) and then discuss any sources of heterogeneity in the findings.

Meta-synthesis
We will also use a form of meta-synthesis to synthesise some of the identified qualitative data. SP and NK will be joined by AM, an experienced meta-ethnographer, for this aspect of the project. This approach will address a number of our research questions and objectives, and allow research using qualitative methodologies to inform our review. Meta-synthesis is an evolving methodology which has been developed to enable systematic synthesis of qualitative data (8-11). We will use meta-ethnographic methods to both explore iterative themes within the data and deductively address some of the research questions. This has been used in a number of contexts including help-seeking experiences in cancer (12); diabetes care (9); and medicine taking (13). Appropriate papers for this process will be selected from the descriptive summary. These papers will be assessed for quality using an adapted CASP tool for qualitative methods, including assessment of relevance and theoretical or conceptual content (14). Meta-ethnography was first described by Noblit and Hare (15) and allows researchers to make explicit the layers of interpretation within the process of synthesising qualitative data (16). Data from the selected papers are tabulated to display empirical participant reported data (‘first order’) and author’s reported interpretations of the participant data (‘second order’) concepts. These are then translated or mapped across the included papers to understand the range of concepts presented. The authors of the review then develop their own interpretations of this data (‘third order’) through exploring the similarities, refutations and lines of argument present within the data (15). Insights developed through this process of meta-synthesis will be used to critically question the quantitative data within the meta-analysis (8).

Economic analysis
Experience suggests that the number and quality of economic studies will be low. We therefore plan to limit our economic analysis to a narrative description of the costs associated with general practice teaching.

Pilot study
We are conducting a pilot study to test the processes for this review. During our initial searches, we identified 9 key papers which we are currently using to test the data extraction tool (17-25). While it may not be possible or appropriate to conduct the entire synthetic process (especially for the meta-ethnography) at this stage, this should help highlight any issues which might inform the review process.

7. Project timetable
Please see Appendix 2 for a timeline for this project.

8. Conflict of interest statement
This team has been brought together with both topic and methodological expertise. Some members of the team are not directly familiar with general practice undergraduate medical education in the UK (JT, MN, PB, BA) and are method experts. Others are involved in either provision, organisation or
research within this context as part of their professional roles (JR, SP, RK, MH, EM, SI). Others are involved as ‘users’ in some capacity as patients or medical students (ZG, NK, AB). This ‘insider’ knowledge will undoubtedly inform and enrich this study including data identification; questions of the data; and application of findings. There are, however, some potential conflicts of interest, should no benefit or positive findings be found. The research team are meeting regularly to discuss the project, as well as stakeholder consultations, and will make every effort to remain critical of the data and analytical processes throughout the project.

This work has been funded by the National School of Primary Care Research (NIHR).

9. Plans for updating the review
We would be keen to update this review in future when appropriate. This may be dependent on further successful funding applications.

10. Changes to the protocol
As per the guidance, any amendments to the review topic, protocol or data extraction sheets will be recorded along with a rationale for the changes. Any significant changes to the protocol will be submitted to BEME for approval.
References


