

## BEME GUIDE

# A BEME systematic review of UK undergraduate medical education in the general practice setting: BEME Guide No. 32

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## Abstract

**Background:** General practice is increasingly used as a learning environment in undergraduate medical education in the UK.

**Aim:** The aim of this project was to identify, summarise and synthesise research about undergraduate medical education in general practice in the UK.

**Methods:** We systematically identified studies of undergraduate medical education within a general practice setting in the UK from 1990 onwards. All papers were summarised in a descriptive report and categorised into two in-depth syntheses: a quantitative and a qualitative in-depth review.

**Results:** 169 papers were identified, representing research from 26 UK medical schools. The in-depth review of quantitative papers ( $n=7$ ) showed that medical students learned clinical skills as well or better in general practice settings. Students receive more teaching, and clerk and examine more patients in the general practice setting than in hospital. Patient satisfaction and enablement are similar whether a student is present or not in a consultation, however, patients experience lower relational empathy. Two main thematic groups emerged from the qualitative in-depth review ( $n=10$ ): the interpersonal interactions within the teaching consultation and the socio-cultural spaces of learning which shape these interactions. The GP has a role as a broker of the interactions between patients and students. General practice is a socio-cultural and developmental learning space for students, who need to negotiate the competing cultures between hospital and general practice. Lastly, patients are transient members of the learning community, and their role requires careful facilitation.

**Conclusions:** General practice is as good, if not better, than hospital delivery of teaching of clinical skills. Our meta-ethnography has produced rich understandings of the complex relationships shaping possibilities for student and patient active participation in learning.

## Introduction

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 general practice involvement further (GMC 2009).

Empirical research in this setting has been carried out usually with minimal or no funding; in single institutions; and consequently represent small scale studies (Cook et al. 2007; Todres et al. 2007), making conclusions difficult to apply beyond the individual institution (Eva & Lingard 2008). As yet, no systematic review has addressed the learning context of general practice for undergraduate medical students in the UK. Bringing together and understanding the existing research

## Practice points

- Patients may feel embarrassed, anxious or objectified in teaching consultations. These feelings can be minimised when a GP welcomes patients into the social community of the teaching encounter.
- There are a number of practical ways in which a GP can facilitate the active participation of students and patients in a teaching consultation and minimise power hierarchies.
- Students need support and guidance when negotiating the different cultures across teaching and learning environments.
- We recommend that future research about the effectiveness of general practice placements might use routinely collected medical student assessment data from multiple practice sites and medical schools.
- Further research is required to understand the complexities of patient participation in medical education.

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literature in this field will help inform, shape and maximise the future benefits of teaching and research in this field.

The aim of this project was to identify, summarise and synthesise empirical research evidence on delivering undergraduate medical education in general practice in the United Kingdom to maximise the impact of existing research and to shape future research in this area. The main review questions were 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 described or evaluated within the empirical literature?
- (6) What costs of undergraduate teaching in general practice have been described?

## Methods

### Literature search

We searched seven electronic databases (Medline, Embase, CINAHL, PsycInfo, BEI, ERIC, AED) to March 2013, using search terms relating to medical education, general practice and family medicine (see Appendix 1 for the Medline search strategy, available online as supplementary material). We also searched by hand three key medical education and general practice journals: *Med Educ*, *Family Medicine* and the *Br J General Practice* from 1990 to March 2013, and hand-searched reference lists of the final group of studies included in the two in-depth syntheses.

### Screening and inclusion/exclusion criteria

We used EPPI-Reviewer 4 software to manage and screen the citations (Thomas et al. 2010). Four reviewers (NK, SP, MH and RK) double-screened all identified citations after de-duplication. Disagreements at this stage were resolved through discussion and the citation was not retrieved if both reviewers agreed that the citation was not relevant. The full-text of the paper was retrieved when either reviewer was uncertain about inclusion. Full text screening was conducted by SP and NK simultaneously. Any disagreements were resolved through discussion between reviewers. Papers that were included at full-text screening entered the data mapping and extraction stage.

Empirical studies of undergraduate medical education within a general practice setting in the United Kingdom were

included. The main inclusion criteria detailing our definitions of student, general practice and learning are listed below:

- Medical students were 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.
- We used the definition of 'general practice' developed by WONCA Europe as a definition of 'Family Medicine' (Anon 2013).
- We defined learning as a socio-cultural process involving a range of possible knowledge acquisition including behavioural, emotional or cognitive development.

The main exclusion criteria were:

- Studies looking at learning amongst groups other than medical students
- Studies that did not consider medical education in a general practice setting
- Studies conducted outside of the United Kingdom
- Studies published prior to 1990
- Papers describing non primary empirical research
- Papers not written in English

Where it was not explicitly stated where the study was conducted, we considered the location of the authors and excluded papers where all authors were based outside of the UK. Studies with no new primary data (e.g. systematic reviews) were not included, but were used as a source of identifying other empirical studies.

### Initial data extraction and grouping of studies

One reviewer (NK) conducted an initial data extraction (also referred to as data mapping) of all included studies to inform a descriptive summary of the literature; 10% of these papers were also extracted by one other reviewer for quality assurance. The initial data extracted from all included papers were used in the production of a descriptive summary of the literature. This initial data extraction/mapping included basic descriptive information on each paper (summary of the information collected is shown in Box 1).

### Quality assessment for inclusion, in-depth syntheses

One of the aims of the initial data extraction was to identify high quality studies for in-depth data extraction. In order to achieve this, the papers were categorised and assessed for quality based on study methodology (Figure 1).

#### Box 1. Information collected from each study in initial data extraction.

- Which of the review research questions each study answered
- Study year
- Medical school
- Study methodology
- Study outcomes
- Description of the teaching activities
- Subjects taught
- Duration of teaching
- Where in the curriculum the teaching took place
- Who delivered the teaching

Firstly, based on the initial data extraction, the papers were categorised into quantitative or qualitative methodology (or both, where the study comprised different methodological approaches). We then conducted a quality assessment of the quantitative and qualitative studies as described below:

- Quantitative studies

Initial quality assessment: did the study use a non-subjective outcome measure, and did the paper have a comparative group, for instance, a comparison between hospital and general practice teaching. If yes, the study progressed to an in-depth data extraction and quality assessment using the Weight of Evidence score/Maryland Scientific Methods Score to assess effectiveness and impact of general practice placements.

- Qualitative studies

We selected papers which considered a patient or student perspective. We then conducted a quality assessment of these papers to establish inclusion in the meta-ethnography using an adapted Mary Dixon-Woods quality assessment of relevance, quality and theoretical utility. Papers rated as 'key' papers progressed to the meta-ethnography and underwent further analysis.

### Quantitative outcome measures in-depth analysis

In order to answer the question, 'what is the effectiveness and impact of learning in a general practice setting' we focussed on those studies which used a quantitative outcome measure to answer two questions: firstly was there a difference between student learning in a hospital compared to a general practice setting, and secondly was there an impact on the general

practice consultation if a student was present? In order to answer these questions, we looked at studies which reported a comparison between:

- Hospital and general practice settings, or
- General practice consultations with a student present or not present

Following an initial quality assessment of the quantitative papers, selecting only those with a comparative group and use of a non-subjective outcome measure, we conducted an in-depth data extraction and quality assessment of these papers using an adapted Eppi-Centre Data Extraction tool (EPPI-Centre 2010).

### Quality assessment of quantitative in-depth papers

The aim of conducting an in-depth quality assessment for the included quantitative outcome papers was to establish the robustness of the data and establish what causal claims could be made about the teaching intervention. The initial quality screening questions about use of comparative groups and non-subjective outcome measures enabled us to quickly exclude results relating to perceived impacts of teaching. We included results based on non-subjective measures, such as hours of teaching, or validated scores. After this initial process, we conducted an in-depth quality assessment and data extraction. The quality of each included study was assessed using an adaptation of the EPPI-Centre's weight of evidence (WoE) framework, which is based on the Maryland Scientific Methods Scale (MSMS) (EPPI-Centre 2010; Gough et al. 2012). The WoE framework takes into account a number of quality assessment issues which are used to calculate the final weight of evidence scores and to determine whether the study findings can be

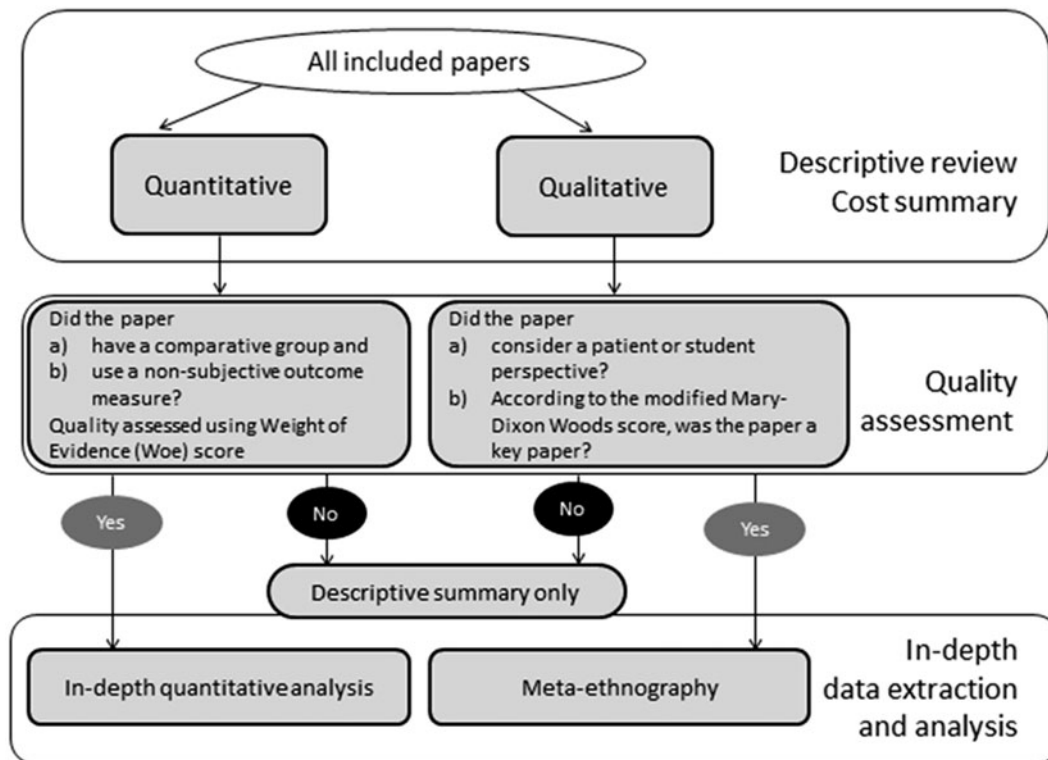


Figure 1. Flow of papers in the review.

trusted in answering the study questions. Two reviewers (RK and MH) used this tool to agree a weight of evidence score for each paper. Any differences between reviewers on the quality scoring were resolved through discussion with the team.

### *Data synthesis of quantitative in-depth papers*

Results for the quantitative outcome studies were considered under three main headings:

- Is there a difference between learning outcomes in general practice placements compared to hospital placements amongst undergraduate medical students?
- Why might general practice placements affect learning outcomes compared to hospital placements?
- Does student presence affect patient satisfaction or enablement in general practice?

For papers reporting Objective Structured Clinical Examinations (OSCE) results, we reported results and used Stata MP 10.1 to demonstrate effect sizes on a forest plot. We did not calculate a pooled or combined result due to the variability in the approaches and reporting of these studies.

Included papers reported learning activities such as the time spent teaching by general practitioner or hospital tutors, supervised ward or clinic based teaching or time spent with patients. We calculated a non-weighted average time spent for each activity in hospital or general practice settings, and compared these between the two settings. For the final group of papers reporting patient satisfaction and enablement, we calculated the standardised mean difference (SMD) to determine whether the authors reported a difference with students present in the consultation. We combined the SMD to produce a summary statistic for each outcome where there were more than two studies reporting comparable results.

### Qualitative studies and meta-synthesis

Meta-ethnography is an interpretive approach towards synthesising qualitative research, leading to substantive interpretations by identifying shared concepts and themes mapped across studies (Noblit & Hare 1988; Smith et al. 2005; Gough et al. 2012). We conducted a meta-ethnography of the literature considering the patient and student perspectives of involvement in undergraduate medical education in the UK. These two perspectives provided the richest data. We did not include papers which focussed on the general practice tutor or organisational perspectives in the in-depth synthesis as these papers focussed upon teacher training needs, general practice infrastructure and the challenges of working as a teacher in the general practice setting, and not consider the experiences of students and patients, which was the overarching focus of the meta-ethnography.

Three reviewers (SP, AM and NK) carried out the meta-synthesis. We used a seven stage meta-ethnographic approach as described by Noblit and Hare (1988). We firstly established the focus of the study and determined which studies were relevant and credible for inclusion. The selection criteria for inclusion were informed by previous work (Noblit & Hare 1988; Dixon-Woods et al. 2001; Smith et al. 2005) and iteratively developed and used by SP and AM to independently double screen each qualitative paper to determine its essential

relevance, quality and theoretical utility for inclusion in the meta-ethnography. Papers were judged as key if they addressed all domains of relevance, quality and theoretical utility for this review. Only key papers were included in the meta-synthesis.

### Descriptive summary

All included papers contributed to a descriptive review of the literature. This included both papers from the in-depth syntheses and papers excluded from the in-depth syntheses, such as subjective self-report assessments (e.g. satisfaction surveys) and un-validated measures.

We used a data extraction form to map all included papers. This information was then read and re-read informing production of tables addressing three of the main research questions: what learning activities have been reported to happen in undergraduate general practice teaching; what do students, teachers and patients perceive to be the benefits and dis-benefits of undergraduate medical education in general practice; and finally, what are the costs of undergraduate teaching in general practice.

## Results

### Literature search and outputs

A total of 12,477 independent records were identified through searches of electronic databases and were screened at the title and abstract stage. 2509 papers were included at the title and abstract stage for full-text retrieval. Following full-text screening, a total of 169 papers were included in the review. See Figure 2 for a flowchart of the screening stages.

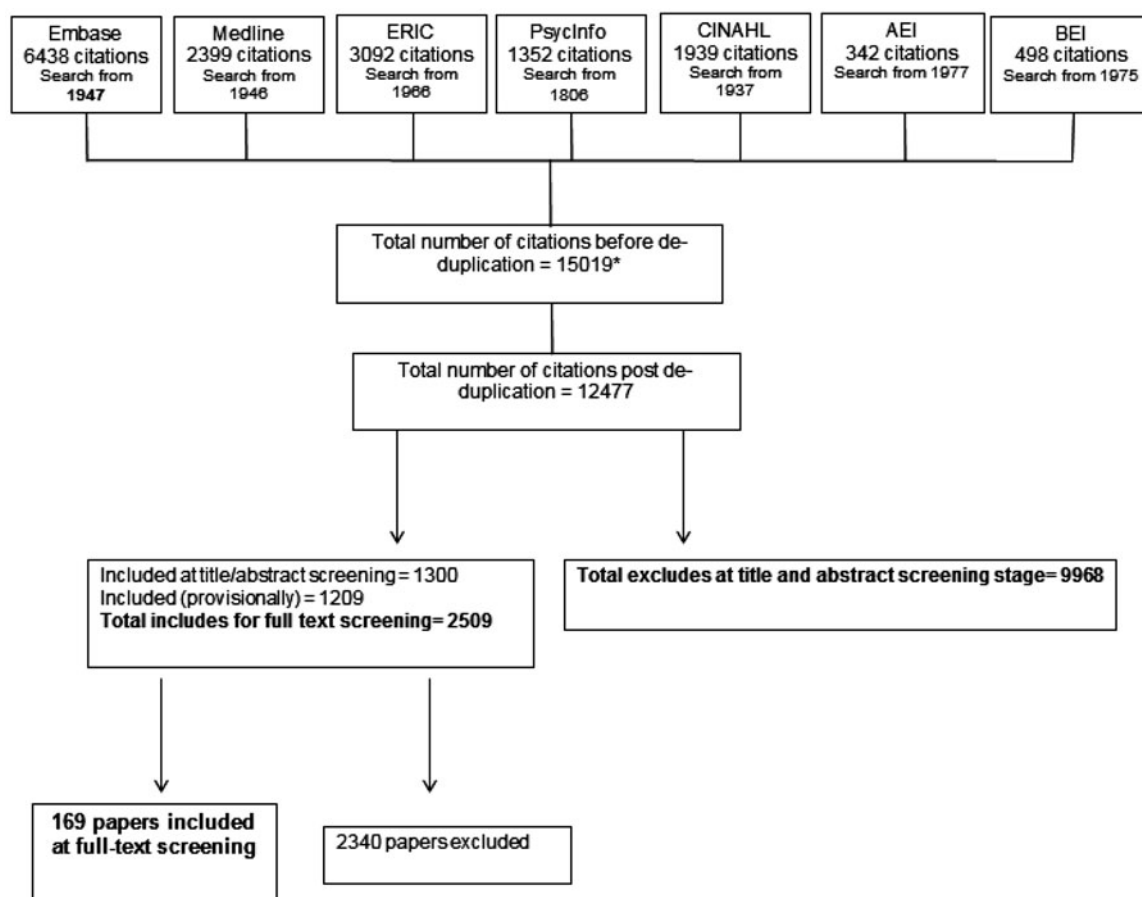
A summary of all 169 papers included in this review, and how they contributed to the results, is shown in Appendix 2, available online as supplementary material.

### Descriptive results and characteristics of studies reporting undergraduate teaching activities in UK general practice

We conducted an initial data extraction and mapping exercise of all 169 papers included in the study in order to describe the characteristics of the papers and to explore learning activities, professional groups involved in teaching, perceived benefits and dis-benefits of teaching, and the financial costs of undergraduate medical education in general practice.

Research from 26 medical schools in the UK was represented in this review (Figure 3, available online as supplementary material).

Of the papers reporting a specific curriculum year of general practice teaching, 55% described learning activities in years 3, 4 and 5 of the undergraduate medical degree, which correspond to the 'clinical' years in UK medical degrees (Figure 4, available online as supplementary material). 18% of papers described teaching activities in years 1 and 2 of teaching, which typically comprised of early clinical contact or experience programmes (Mowat & Hudson 1996; Hampshire 1998; Lammie et al. 2002; Nicholson et al. 2003; Hopayian et al. 2007; Howe et al. 2007; Basak et al. 2009). One survey found



**Figure 2.** Flowchart of papers in the review. Duplicate citations identified in the searches were removed prior to screening.

that general practice provides between one-third and one-half of early patient contact in the first two years of the undergraduate medical course (Hopayian et al. 2007).

Twenty-five percent of papers did not specify the year of the general practice teaching, or described teaching activities that covered multiple years of the undergraduate curriculum (shown as 'not-specified/across curriculum years' in Figure 4, available online as supplementary material).

The majority of teachers were identified as general practitioners, with a smaller proportion of nurses, university academic staff and patients identified as the primary teachers/tutors. Papers also reported a range of allied health professionals who were involved in teaching in general practice, including midwives, social workers, physiotherapists and pharmacists.

The greatest proportion of studies report teaching activities relating to core general practice during undergraduate placements in general practice (Figure 5, available online as supplementary material). We used the term core general practice either if the paper referred to the teaching as 'general practice' or if the teaching placement was part of a general practice rotation. There was a broad range of additional teaching reported, which we collated, tabulated and then categorised into medicine and surgery. Topics included in the medicine category included palliative medicine, ophthalmology, dermatology, cardiology, obstetrics and gynaecology, paediatrics, rheumatology, orthopaedics, neurology, psychiatry and care of the elderly.

Fifteen papers described teaching activities around professionalism and communication skills, including teaching on roles of other health professionals and medical professionalism. Papers categorised as 'operational or critical skills' topics included teaching on IT skills, medicine and literature, significant event analysis and audit skills.

### Descriptive results of perceived benefits and dis-benefits of undergraduate teaching activities in UK general practice

Eighty-two papers considered the perceived benefits and dis-benefits of undergraduate medical student teaching in a general practice setting from the student, teacher/general practitioner or patient perspectives. The studies used subjective questionnaires, informal feedback from students and GP tutors, student evaluation forms, reflective portfolios, and qualitative methodologies such as focus groups, semi-structured and in-depth interviews.

We categorised the reported results for each of the three perspectives (student, teacher/GP and patient) into cognitive, emotional and behavioural outcomes. A summary of these categories is shown in Table 1.

#### *Student perspectives*

Medical students described a range of perceived benefits and dis-benefits in terms of the cognitive, emotional and behavioural outcomes of placements in general practice, which are

**Table 1.** Deductive outcomes of descriptive review: cognitive, emotional and behavioural.

| Outcome     | Student  | Teacher/GP   | Patient   |
|-------------|--|--|---|
| Cognitive   | Disease-based knowledge, understanding about social aspects of health, reflective practice | Increased knowledge through teaching, learning new facts | Increased understanding about disease, treatment, prognosis |
| Emotional   | Empathy, self-awareness  | Anxiety, exposure, sense of reward                       | Altruism, sense of reward, confidence, anxiety              |
| Behavioural | History, examination and consultation skills   | Developing and teaching consultation skills              | Understanding of disease framework and language             |

shown in detail with full references in Appendix 3, available online as supplementary material.

Students identified several benefits to learning in a general practice setting, including exploration of the psychosocial impact of illness and the social and environmental factors which determine health. Students reported valuing the opportunity to learn more about general practice as a potential career. In terms of dis-benefits, there was a perception amongst some students of a limited availability of 'interesting' and acute medical cases within a general practice setting, which some students felt may have limited their learning opportunities.

We also considered emotional outcomes reported by medical students as a result of general practice placements. Several papers described how students enjoyed the learning opportunities available in general practice and the friendliness of the practice atmosphere. Having the opportunity to speak to patients and conduct physical examinations led to increased confidence in clinical skills. Courses which offered early clinical experience (in the pre-clinical years 1 and 2) helped to motivate students to persevere through the didactic components of their degree. However, some students reported feeling stressed as a result of the amount of work expected of them, and others described how placements in rural locations led them to feel isolated from social and professional circles. Travel to and from rural practices was also seen as a barrier by students who did not opt for attachments in these practices.

Lastly, general practice placements led to several positive behavioural outcomes for students. Many enjoyed the range of teaching activities, from the opportunities to conduct their own consultations, as well as developing additional skills such as critical appraisal and professional skills. Several papers found that students valued receiving direct feedback on their history taking and physical examination skills, which was in contrast to hospital-based firms with fewer feedback opportunities. The multidisciplinary teams in general practice allowed students to learn skills from allied health professionals such as nurses, midwives and pharmacists.

#### *Patient perspectives*

Patients were often involved in teaching of undergraduate medical students, and were either formally invited to participate in a teaching session, or attended their practice while a student was sitting in with their GP during the consultation. Details of the perceived benefits and dis-benefits in terms of the cognitive, emotional and behavioural outcomes as

described by patients in the included papers is shown in Appendix 4, available online as supplementary material.

Patients identified a range of benefits and dis-benefits to their own involvement in medical student learning. In terms of cognitive outcomes, some patients felt that they were able to gain knowledge and learn more about their own illness by taking part in a teaching consultation. Patients also described how they had more time to discuss their condition with their GP, and felt more involved in the care of their own condition by listening to their GP discussing their condition with medical students. For some patients, the extra time with their GP led them to feel that they would receive better treatment. However, being used as a 'teaching case' sometimes reinforced feelings of ill-health.

There were a wide range of emotional outcomes as a result of participation in undergraduate medical education. Many patients described how being a part of teaching reinforced feelings of altruism and promoted feelings of 'giving something back' to their doctors. Involvement in teaching was inherently enjoyable for some, and provided a relief from social isolation for some elderly patients. Conversely, some patients described the negative emotional consequences of taking part in teaching. Some patients were concerned about student access to their case notes or computer health records. For some, being used as a teaching subject generated feelings of anxiety and embarrassment, especially during intimate examinations when a student was present (Benson et al. 2005). Other patients felt less able to voice their concerns or discuss personal matters when a student was present, feelings that were described as being 'shy' or 'inwards'. And finally, being used as a 'teaching case' meant that some patients felt objectified and alienated as a result.

#### *GP/teacher perspectives*

GPs and other general practice-based teachers identified a number of cognitive, emotional and behavioural outcomes as a result of their involvement in undergraduate medical education. A summary of the perceived benefits and dis-benefits as described by GPs and teachers in the included papers is shown in Appendix 5, available online as supplementary material.

Overall, GPs felt that these placements had several benefits in terms of cognitive outcomes, including the chance to gain new knowledge and maintain their knowledge base by teaching students. GPs also reported several emotional benefits to teaching, including increased confidence, and enjoying

the 'feel good' factor of teaching enthusiastic and positive students. Some GPs also felt being a teaching practice brought prestige (Quince et al. 2007). Several papers noted that GPs enjoyed teaching medical students as it led to a greater variety in their working week, making their work more interesting and enjoyable. However, to counter these emotional benefits, GPs described how increased time pressures as a result of teaching led to increased stress, anxiety and concerns about money and payments. Some GPs and practice staff worried that the additional incidental workload would negatively affect practice morale. Additionally, negative teaching experiences and receiving criticism from students was an emotional dis-benefit of teaching.

In terms of behavioural outcomes, GPs identified that they were able to spend more time with their patients during teaching consultations. Additionally, the teaching experiences and student's questions provided an impetus for GPs' continuing medical education. Some GPs, however, wondered if the increased workload as a result of teaching could impact or conflict with patient service demands, but this was a perceived rather than proven adverse effect.

### Quantitative outcome measures in-depth analysis

From the 169 papers included in the overall review, 7 papers met the quality criteria for inclusion in the quantitative in-depth analysis. A summary of these 7 papers, along with the final quality rating, is shown in Appendix 6, available online as supplementary material. We report the synthesised findings from these papers below.

#### *Is there a difference between learning outcomes in general practice placements compared to hospital placements amongst undergraduate medical students?*

Three single-institution studies in this review compared results in Objective Structured Clinical Examinations (OSCE) stations (history taking and examination) achieved amongst students taking part in general practice compared to hospital placements (Murray et al. 1997a, b; Johnston & Boohan 2000). Results from these studies are shown in Table 2, available online as supplementary material. Two of the papers were conducted by Murray et al at University College London following the introduction of a programme which placed one entire third year medical school firm in general practice (Murray et al. 1997a, b).

Murray's first study, published in 1997, assessed a community-based firm where students were involved with both conducting clinical examinations as well as sitting in on consultations with their GP tutor two days each week. An OSCE was carried out at the end of the rotation. The results of this study showed that students based in the general practice clinical firms performed as well or better in the history taking and clinical examination stations (Table 2, available online as supplementary material). Students taught clinical skills in general practice overall scored higher on OSCE stations for cranial nerve examinations, communication and history of chest pain.

The second study by Murray et al was a randomised crossover trial of students allocated to general practice or hospital firms. All students received a 5-week placement in hospital and 5-week placement in the community and were randomly allocated to have the first 5-weeks in either GP or hospital. The outcome measure was student scores in two parallel OSCE examinations (P and Q) for students at week 5 and week 10 of the placements. Among all skill domains tested, there was no significant difference in outcomes; students acquire their clinical skills as well in general practice as in hospital. There were no significant differences in OSCE results for history taking, communication or physical examination skills. However, time spent on community placements improved student scores significantly more than hospital placements.

Johnston et al followed on from the Murray et al. papers at Queen's University Belfast to determine whether clinical skills learning were comparable between GP and hospital environments (Johnston & Boohan 2000). The study included medical students who were randomly allocated to a hospital unit or GP's surgery for weekly 3-hour clinical skills teaching sessions. The main outcome of this paper was the total OSCE score on six stations after completion of the rotation. The findings suggested no significant differences between medical student scores for the OSCE, with no significant difference between the number of exam failures between hospital and general practice teaching in this institution.

The standardised OSCE scores from the three papers described in this section are summarised visually in Figure 6, available online as supplementary material. This chart shows that hospital or general practice training did not impact on OSCE scores for the majority of OSCE stations examined, however, students learning clinical skills in general practice in one of the Murray et al. papers published in 1997 tended to perform better than students learning these skills in the hospital setting (Murray et al. 1997b).

#### *Why might general practice placements affect learning outcomes?*

Four papers reported learning activities and patient interactions compared between general practice and hospital settings (Murray et al. 1997b, 1999, 2001; Johnston & Boohan 2000). We considered whether there were reported differences in the way teaching was provided in each setting, which may have impacted on how or what students learned.

Johnston et al administered a questionnaire covering 4 areas to all medical students: organization and delivery of teaching; good teaching characteristics evidenced by the tutor; the value of the course, in terms of education and enjoyment, and what should be done differently. A summary of these findings from the paper are shown in Appendix 7, available online as supplementary material; briefly students received more teaching activity time with their tutors; this teaching included time for discussion, time teaching with patients and time in lectures.

Murray et al conducted three studies looking at learning activities during general practice placements. In the first study, students on the community firm reported clerking a median of

4 patients per week and presented histories to their tutors 3 times a week, compared to 2.5 per week and once, respectively for the hospital based firm ( $p < 0.005$ ) (Murray et al. 1997b). The next study was conducted over the 1995–96 academic year, and surveyed students on their activities during a general practice and hospital attachment for learning general internal medicine (Murray et al. 1999). Students reported that while on general practice attachments, they presented more histories and were observed examining more patients than in hospital. The final study by Murray et al involved a log diary study of UCL students in their first clinical year in 1997–98 to determine the proportion of time students spent on different activities on internal medicine clerkships in general practice and hospital (Murray et al. 2001). Students spent approximately five and a half hours on educational activities each day, with very little difference in time spent on activities between hospital and general practice. However, students spent less time on unsupervised interaction with patients, less time waiting for teaching and more undergoing assessment by a clinical teacher in general practice compared to in hospital.

We combined results from all studies reporting learning activities by calculating a non-weighted average for three main categories: time spent being taught, supervised teaching and time spent with patients. The average time spent teaching across the different studies was 70 minutes in general practice and 48.6 minutes per day in teaching/district general hospital settings. Across the Murray and Alderman studies (Murray et al. 2001), we found no significant difference in time spent with patients between hospital and general practice settings (41 minutes in general practice compared to 48 minutes in teaching hospitals,  $p = 0.2023$ ).

#### *Does student presence affect patient satisfaction or enablement in general practice?*

Two papers reported comparative results pertaining to patient satisfaction during or after teaching consultations using three different measures: the Patient Enablement Index (PEI) (Howie et al. 1998), the Consultation Satisfaction Questionnaire (CSQ) (Baker 1996) and the Care and Relational Empathy (CARE) measure (Mercer et al. 2004) (Table 3, available online as supplementary material). These papers help answer the question: do patients perceive there to be a problem to have students present in the consultation?

Benson et al used the PEI and CSQ to compare patients' enablement and satisfaction following teaching and non-teaching consultations. The teaching consultations involved a 20 minute session in a prearranged teaching clinic where students initiated consultations and performed histories and examinations of patients. There was no difference in respect to PEI scores between patient consultations with a student present compared to patient consultations without a student present. Results from the CSQ showed weak but non-statistically significant evidence suggesting that patients attending teaching consultations were more satisfied compared to patients attending non-teaching consultations.

Price et al investigated whether the presence of medical students affects quality in general practice consultations using the PEI and CARE. PEI scores were similar between patients

involved in teaching and non-teaching consultations. There was a significant difference between teaching and non-teaching consultations in terms of the measurement of relational empathy (CARE score). The authors suggest that the small difference in scores does not translate into a meaningful difference, but this could reflect a change in the doctor-patient relationship with students present.

Results from the PEI were captured in both the Price and Benson papers, and we combined the PEI scores using the standardised mean difference to calculate an aggregate PEI score across the two studies. The aggregate PEI results showed a pooled SMD of  $-0.057$  (95% CI  $-0.128$  to  $0.0149$ ), which represents a non-significant difference in PEI scores between students on general practice compared to hospital placements; in other words, there was no difference measured between patient enablement amongst patients involved in teaching consultations in hospital and general practice setting.

#### **In-depth qualitative synthesis: Meta-ethnography**

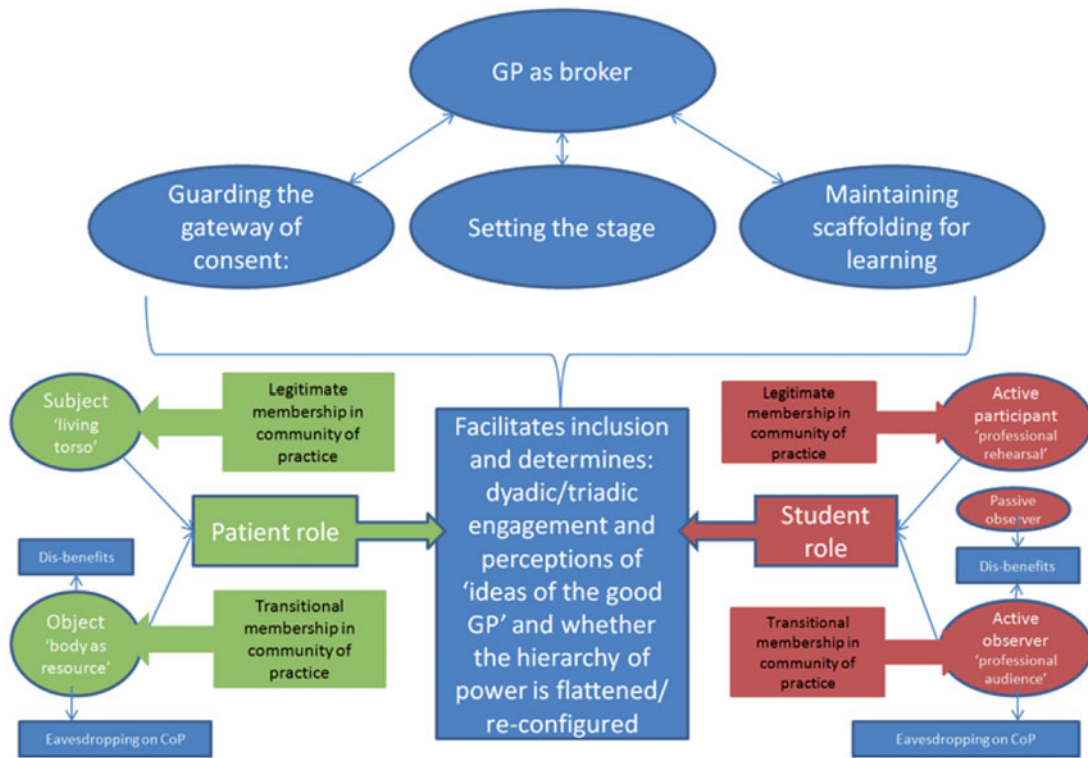
Following full-text screening, a total of 87 qualitative studies were identified and considered for inclusion in the meta-ethnography. Ten papers were judged as key papers and were included in the meta-ethnography (Mattsson et al. 1991; Thistlethwaite & Jordan 1999; Silverstone et al. 2001; Howe et al. 2002b; Henderson et al. 2003; Benson et al. 2005; Ashley et al. 2009; Pearson & Lucas 2011b; Lucas & Pearson 2012; McLachlan et al. 2012). A description of the included papers is shown in Appendix 8, available online as supplementary material.

Two main thematic groups emerged from the papers. Group 1 papers represented the interpersonal interactions within the teaching consultation and group 2 papers represented the socio-cultural spaces of learning which can shape those interactions. Each group of papers were first translated separately using a reciprocal approach, and then were brought together using a line of argument synthesis (Noblit & Hare 1988).

#### *Reciprocal synthesis of group 1 papers: Interpersonal interactions for learning*

We developed a model to visually demonstrate the synthesis of Group 1 papers, which represent the interpersonal interactions within the teaching consultation (Figure 7). Three papers included in this meta-ethnography draw upon communities of practice theory, a commonly cited theory underpinning learning and skill acquisition in medical education, in their research and analysis (Lave & Wenger 1991; Ashley et al. 2009; Wenger 2009; Pearson & Lucas 2011b; McLachlan et al. 2012). We therefore developed our interpretations of the Group 1 papers through the lens of community of practice theory. Within the setting of the consultation, the papers in Group 1 suggest that membership within the community of practice supported the student's emotional and practical learning needs. We describe below the model represented in Figure 7.





**Figure 7.** Model of group 1 papers: GP as a broker of communities of practice.

*GP as broker.* Conceptually, the papers included in Group 1 of this synthesis emphasise the importance of the GP as a 'broker', a mediator and a guide for constructing the nature of the interactions within the teaching consultation; allowing and overseeing membership to this community of practice.

*Setting the stage.* Students and the patient viewed the GP as a director of the consultation, who influenced the educational dynamics through setting the 'stage' of the teaching consultation, maintaining a scaffolding for learning during the teaching encounter, and guarding the gateway for patient consent to participate in teaching. How the GP negotiated these interactions determined the range of active engagement, membership to the community of practice, perceptions and ideas of the 'good GP' and determined the hierarchical nature of the power dynamics within the teaching consultation. The papers describing triadic learning (between the GP, patient and student) within the teaching consultation emphasise that 'flat hierarchies' and participatory learning is beneficial for the student and patient, and facilitates interactions between the two. In the eyes of the student, minimal power hierarchy builds respect between the student and the GP tutor (Pearson & Lucas 2011b). From the patient perspective, flattening of the hierarchy meant that the patient was able to talk to two people (the GP and the student) instead of just one (the GP), which was seen as beneficial, as patients felt empowered and emotionally supported by students (Ashley et al. 2009). As opposed to the hierarchical learning perceived as endemic by tutors and students in hospital settings, the actions of a GP can promote a flattening of the interactional power hierarchies in

learning, such that both students and patients experience mutual respect and reciprocity in the general practice learning encounter.

Prior to the consultation, setting the stage of the consultation entailed several steps towards facilitating the role of the student and the patient as active and engaged participants within the teaching consultation. Ensuring patient consent, contextualising the situation with the student prior to the consultation, and the physical arrangements of the space and seating within the consultation can improve communication and engagement, and thereby impact upon the educational dynamics of the learning (Ashley et al. 2009).

*Maintaining scaffolding for learning.* During the teaching consultation, the GP also provided the framework for engagement by discussing with students their role within the teaching consultation. From the student perspective, a lack of orientation in their role, or lacking knowledge of the context of the consultation, disenabled their participation within the community of practice (Ashley et al. 2009). Prior to the consultation, student participation was promoted by GPs who provided a scaffolding for the learning by understanding and ensuring relevance to the medical curriculum, and focussing and contextualising the student's existing knowledge (Silverstone et al. 2001; Ashley et al. 2009). Additional steps included booking extra time off during consultations and after surgeries for discussion, arranging for the student to see patients they felt were clinically 'interesting', and providing a structured timetable (Thistlethwaite & Jordan 1999; Silverstone et al. 2001; Ashley et al. 2009).

*Guarding the gateway of consent.* The importance of early and informed patient consent, which was seen as the GPs responsibility to procure, was raised by both patients and students in these papers. Benson et al suggested that patients felt pressured to consent to a student's presence at very short notice, for instance, while walking with the GP from the waiting room to the consultation (Benson et al. 2005). This was an especially important issue to patients consulting for sensitive, 'embarrassing' or personal issues (McLachlan et al. 2012), especially as student presence during intimate examinations was sometimes seen as intimidating and humiliating to patients (McLachlan et al. 2012).

*The student's role.* The role of the student during these placements and their emotional experiences and interactions were shaped by their membership within the community of practice and how the consultation was facilitated by the GP. A positive experience for the student as a legitimate member of the community of practice was conceptualised as a role as active *participant*, or active *observer*. Membership within the community of practice engages the student through active participation within professional and social dimensions, which helps students build a professional identity (Pearson & Lucas 2011b). As an active *participant* in the consultation, the student is invited to rehearse their role in the consultation by assuming the role of a doctor. GPs who invited students to see patients on their own contributed to the concept of students as professionals rehearsing their future role. Being invited to participate in the teaching environment as an active *observer*, or as a 'professional audience' was also facilitated by the GP. Being an active *observer* rather than an active participant provided space and time for students to observe, think and develop professional attitudes and behaviours which mirrored the style of their GP role models (Ashley et al. 2009; Pearson & Lucas 2011b). Observation of doctors in their dealings with patients was seen by students as a 'vital' component of training (Thistlethwaite & Jordan 1999). Active observation was further facilitated by the GP who 'bookended' the consultation through discussion with the students prior to and after the consultation by situating the learning within a cultural and social context (Pearson & Lucas 2011b), and suited students who wanted to actively participate, but were anxious about showing themselves as 'inadequate' (Ashley et al. 2009).

Students who are excluded from the community of practice were positioned as *passive* observers – they are on the outside looking into the community of practice. The GP broker could disempower the student during the consultation; a student could be rendered passive when 'less approachable' GPs undermined the student's confidence or allowed their own familiarity with the patient to exclude the student from the discourse (Ashley et al. 2009). Finally, the student could be disempowered if they were uncertain if the patient had consented to their presence in the consultation (Ashley et al. 2009).

*The patient's role.* Patients within this synthesis were conceptualised as assuming a range of potential roles within the teaching consultation between two poles: as a 'subject', or with their body as a teaching 'object'. When the patient is

treated as a subject, they are granted a legitimate membership into the community of practice. As described by Lucas and Pearson, this role involved the patient acting as a 'living torso', offering 'an authentic insight into how living with illness affects their life' (Lucas & Pearson 2012). Conversely, when they are treated as an object, patients assume a role which sets them outside the community of practice, receiving medical care in a non-participatory role. Adopting the role of object was not always seen by patients as a negative experience; patients sometimes felt that they benefitted from assuming the role of 'object' by gaining knowledge or understanding of their condition by 'eavesdropping' on the community of practice involving the student and the GP (McLachlan et al. 2012).

While exclusion from the community of practice and being used as a resource was accepted by some patients, exclusion from the community of practice and treatment as an object sometimes led to perceived dis-benefits for the patient. Being objectified sometimes led to feelings of exploitation, anger and being 'judged' (McLachlan et al. 2012). Being seen as a subject or an object affected whether the patient saw the doctor as a 'good' GP or not, as involving patients nurtured attitudes esteemed in medicine.

#### *Reciprocal synthesis of Group 2 papers: Socio-cultural spaces for learning*

We developed a second model to visually demonstrate the synthesis of Group 2 papers, which represent the socio-cultural spaces of learning that shape and provide boundaries for the interactions which occur within the teaching consultation (Figure 8).

Our meta-ethnography suggests that general practice is a distinct learning space, and the perspectives within the papers included in this review considered the sociocultural elements of learning in this space. The findings from the meta-ethnography suggest that students are negotiating between the two polarised environments of hospital and general practice teaching, and act to integrate the knowledge and learning of these competing cultures.

*Tensions between hospital and general practice learning.* Moving through hospital and general practice environments, students compare and contrast the strengths and weaknesses of the clinical styles and capabilities of the clinicians they encounter. Students perceived that general practice was a space to learn about expectant management, watchful waiting, successful integration of different subject areas and interviewing skills (Mattsson et al. 1991). More generally, students perceived general practice as a space for broadening their understanding of illness and promoting patient centeredness (Thistlethwaite & Jordan 1999; Lucas & Pearson 2012).

While many students commented positively on the benefits of their general practice placements, they felt restricted in the value of their learning within this space. Students involved in focus groups conducted by Howe et al suggested that the goal of medical education was not to learn in general practice, instead, it was to engage in hospital medicine (Pearson & Lucas 2011b). This attitude was reflected by general

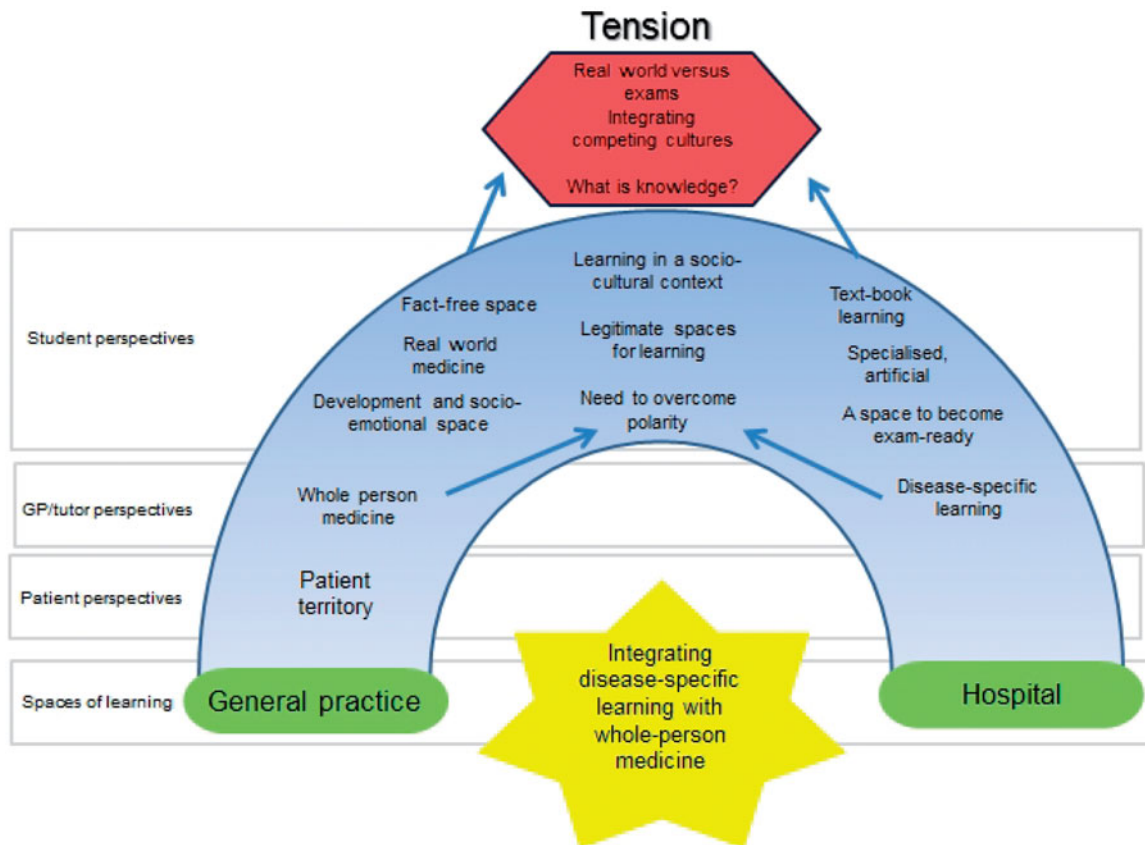


Figure 8. Model 2, socio-cultural spaces for learning.

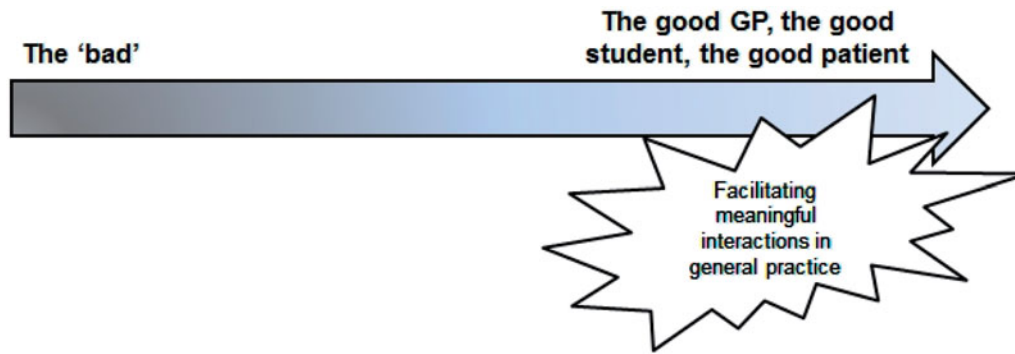
practitioner and community tutor focus groups who perceived students as demonstrating a 'lack of will to embark on an authentic process of mutual engagement' during their general practice placements.

*Real world medicine.* Tutors and students discussed 'real' learning in the spaces of general practice and hospital learning. Both tutors and students agreed that general practice represented the 'real world', and thereby 'real world medicine'. Our interpretations suggest this is because the setting of general practice allowed students to view the encompassing environment and socio-cultural context of patient illness. Conversely, students interviewed following an attachment on a hospital firm described their clinical experience as 'artificial', as the most obliging or interesting cases had been singled out for their teaching encounters (Thistlethwaite & Jordan 1999).

*Text-book learning and spaces to become exam-ready.* The exam-based nature of medical school progression meant that medical students were keen to spend time in placements which they anticipated would maximise their exposure and opportunities to practice summatively assessed clinical skills. Students saw general practice as a space to learn about the social and community aspects of health care, and in contrast, perceived hospital as a space to learn about clinical signs of disease through encounters with patients exemplifying classic disease-based conditions. In Mattson's 1991 paper, students held a persistent view that medicine and clinical skills

were learned in the hospital environment, while teaching delivered in the general practice setting was not perceived to tally with the 'text-book' learning examined in clinical exams (Mattsson et al. 1991). Our interpretations of the papers suggest that students feel a tension between the 'real world' medical training offered in general practice, which is perceived as preparing students for their work as doctors, and the 'textbook medicine' offered in the hospital setting which students feel they need to learn in order to pass their exams. Some students perceived that while student exams are based on hospital medicine, and that hospitals are the 'best setting' to learn this type of medicine, the perceived benefit of learning in a general practice setting was that teaching contributed to a wider knowledge and understanding (Silverstone et al. 2001). This tension was acknowledged but belittled by the tutors and service users interviewed by Howe et al who emphasised the importance of real community settings for learning, but in opposition to the students' focus on learning exam skills, suggested that the goal of medical education was to understand life and not to pass exams (Howe et al. 2002b).

Students described general practice as a positive space for learning, where all staff were involved in teaching to form a 'collective learning environment' (Silverstone et al. 2001). Conversely, students felt incidental on hospital wards, which were seen primarily as a 'fraught' place of work where they felt peripheral to the primary activity of looking after patients (Thistlethwaite & Jordan 1999). These perceptions meant that students had to deal with negative emotions, especially when



**Figure 9.** The spectrum of good and bad in general practice undergraduate education.

they were unable to interact with patients who they felt should not be disturbed. Furthermore, the lack of intimacy in the hospital environment encouraged formality, whereas the intimate environment in general practice promoted an informal, personal approach which tended to make students feel more at ease (Thistlethwaite & Jordan 1999).

*Integrating competing cultures between hospital and general practice spaces of learning.* The third order interpretations from the meta-ethnography suggest that medical students are in pursuit of two kinds of information: knowledge to help them become good doctors, and facts required to pass their medical student exams. Hospital-based medicine represented a disease-centred model to students across the papers in this review, while the meaning of general practice based medicine was steeped in a patient-centred model (Lucas & Pearson 2012). When moving between hospital and general practice placements, students seemed to struggle with these competing discourses during their socialization into medicine, which shaped their development as a clinician depending upon the setting (Howe et al. 2002b). Resolving these competing discourses was especially complex when general practice was seen as a marginal subject by students who developed a strong loyalty to hospital medicine; for these students hospitals were seen as the place for real medicine (Mattsson et al. 1991). Students were caught in this world of contested meaning, and faced a challenge to overcome this polarity and integrate their learning between the disease and patient-centred models encountered in both spaces of learning. One method of facilitating integration was to ensure that hospital and general practice doctors learned more about each other's activities as 'students are likely to understand the complementary activities of these two worlds if given an appropriate lead by their teachers' (Mattsson et al. 1991).

It was important to resolve these competing discourses between hospital and general practice, as amalgamating the learning between both environments helped students develop their learning. Ashley et al emphasised the cognitive benefits of making links between hospital and active learning in general practice; students in general practice placements saw exemplars and personified ideas learned in theoretical and text-book medicine. Henderson et al describe general practice as a setting where students could make links between

ffective, cognitive and practical aspects of learning (Henderson et al. 2003). We suggest through our analysis that general practice provides students with a creative and developmental space to amalgamate their disease-specific learning *and* integrate this with whole-person medicine.

#### Line of argument synthesis of Group 1 and Group 2 papers

Using a reciprocal translation we have presented the papers in terms of interactions in the teaching consultation and spaces of learning. In this section, we draw these concepts together using a line of argument approach to suggest that it is the features of the 'good'; the good GP, the good student and the good patient that influence meaningful interactions in the socio-cultural spaces of learning.

The concept of the 'good' arose from Silverstone et al, who conceptualised the 'good GP' as a teacher, a role model, and the general practice environment to describe a good experience in the community (Silverstone et al. 2001). We propose that the features of the good enable meaningful interactions between the participants in the teaching consultation and develop inclusive and supportive socio-cultural spaces of learning (Figure 9).

The features of the good student, the good general practitioner tutor and the good teaching environment act to flatten the power hierarchies of learning within a triadic consultation. While 'the good' GP actively flattened the hierarchy within the teaching consultation, actions of the 'bad GP' reinforced the hierarchy. From the student's perspective, features of the good GP involved facilitating active learning and managing the interpersonal relationships within the consultation. This involved ensuring a triadic consultation with the GP and the patient by organising the practicalities of how learning should take place. Students felt that an experienced academic tutor provided feedback and personal support to see how students were 'getting on' (Howe et al. 2002b; Thistlethwaite & Jordan 1999).

From the patient's perspective, the experience of participating in education depended on the doctor acting as a mediatory (McLachlan et al. 2012). The 'good' GP was viewed as someone who could communicate issues, listen effectively and respect patients as a person. The good GP also protected and shaped the space of learning by ensuring time for

informed and early consent to participate in teaching consultations (Benson et al. 2005).

Patients involved in medical education carry personal views on the factors comprising the 'good' student. Patients wanted reassurance of the student's competence and experience, which was necessary in order for the patient to make an informed decision about allowing the student into their 'territory' (Benson et al. 2005). The good student also portrayed a sense of 'warmth', which allowed patients to emotionally benefit from the teaching consultation (Ashley et al. 2009). Finally, the student's willingness to interact with patients helped them feel personally validated, a feeling which was reciprocated by students (Ashley et al. 2009).

From the patient's perspective, the 'bad' student had a strong negative effect on the patient's emotional wellbeing. McLachlan et al described how students who treated patients as an object could make the patient feel angry and judged. Furthermore, students who appeared disinterested led to feelings of humiliation and embarrassment amongst patients who also felt objectified in the teaching consultation (McLachlan et al. 2012). In Howe's study, a range of stakeholders identified the bad student as someone who was arrogant and lacking interest about patient needs or perspectives. From the GPs perspective, the difficult students were those who were 'weak' and 'hard work', with 'varying degrees of confidence and emotional baggage'. However, GPs also noted and attributed the hospital 'blame culture' for the student's emotional baggage; the ritual humiliation of students on the wards was perceived as creating a poor model for future peer communication (Howe et al. 2002b).

### Costs associated with undergraduate placements in general practice

A paucity of data regarding the costs associated with undergraduate placements in general practice made this research objective difficult to fulfil. Of the 169 papers included in the review, only 7 made specific reference to financial costs incurred by placements. A summary of the data presented is shown in Appendix 9, available online as supplementary material.

When reporting money allocated to practices involved in teaching undergraduates, some papers simply reported the rate allocated to general practices, while others reported the more direct teaching fees that would be paid to the individual practitioner, for instance, in the form of a lecturer salary. Murray et al presented the most in-depth report of the 'cost' of placements in general practice, by also including an estimate of the cost of university-based teaching and support staff in addition to the community team (Murray et al. 1995, 1997b). They comment that 'community based medical education is not a cheap option' and one of the options available to fund it, namely assigning SIFT payments to Primary Care departments, could have major implications for other departments, for example, in secondary care.

Different medical schools structure general practice placements in different ways, each with varying roles for and expectations on the general practitioner. The reported remuneration from one school may not be directly applicable to

another school, and the true cost of undergraduate teaching in primary care, including the impact on the practice as well as the necessary central support required from the university, is difficult to quantify especially in the absence of recent published data. If we are to realise a more detailed and more current national picture of the 'true cost' of community teaching, we need to commission more in-depth economic analyses.

## Discussion

### Main findings

We have conducted a systematic review of empirical research of undergraduate medical education in UK general practice settings. One hundred sixty-nine papers were included and contributed to a descriptive summary of the research. We then conducted an in-depth analysis of comparative quantitative outcome studies and a meta-ethnography of qualitative studies reporting student and patient perspectives of taking part in general practice medical education.

### Summary of findings from the descriptive review

The majority of teaching in general practice occurs during the clinical years of the undergraduate medical degree, however, general practice is also used as a setting for early clinical contact in years 1 and 2. Medical students learn about core general practice medicine during their general practice placements, but a wide range of other specialties are also taught in these placements. The majority of teaching in general practice was provided by general practitioners, however, other health professionals such as nurses, midwives and social workers also provided teaching. Students described several cognitive, emotional and behavioural benefits to learning in a general practice setting (e.g. gaining an understanding of the socio-cultural environment of illness, gaining confidence in clinical skills, and receiving feedback from general practice tutors), however, described dis-benefits included isolation and less patient contact. Patients involved in general practice teaching experienced personal gain and a sense of altruism, but also described feeling anxious, embarrassed and objectified. Although they acknowledged time and workload pressures, GPs described how involvement in teaching allowed them to maintain their knowledge base and provided variety in their clinical work.

### Summary of findings from quantitative outcomes in-depth synthesis

Seven papers in this review used a comparative quantitative outcome measure to determine either the difference between hospital and general practice settings or the difference to patient satisfaction and enablement in general practice consultations with or without a student present in the consultation. In summary, the studies considering whether or not general practice placements improve learning outcomes above and beyond hospital placements showed that students learning clinical skills in general practice versus hospital settings

achieved similar results in end of rotation OSCEs. The studies were all conducted in single-institutions with the most recent paper published in 2000, and the studies conducted by Murray et al were conducted in Year 3 of the undergraduate medical degree. We did not find any evidence considering the effect of general practice placements compared to hospital placements in later years of the undergraduate curriculum. Given the recent developments regarding an increased drive to train medical students in a general practice setting, there is a paucity of recent cross-institutional evidence to reflect these changes.

We considered why general practice placements might affect learning outcomes in general practice settings as reported in the seven papers comparing general practice and hospital settings. The findings indicate that students receive more teaching time from general practice tutors than hospital tutors, but spent a similar amount of time with patients between district general and teaching hospital and general practice settings.

In terms of patient satisfaction, these papers help answer the question: is patient enablement or satisfaction affected when a student is present in the consultation? The data presented above suggests not, and both the descriptive review and meta-ethnography supports this finding. However, patients scored consultations with student present significantly lower on the CARE scale, suggesting that patients felt a reduced level of relational empathy within their general practitioner during teaching consultations.

### Summary of findings from the meta-ethnography

We identified 10 key papers describing the student and patient perspective of undergraduate teaching in general practice. Two main thematic groups emerged from the meta-ethnography: group 1 papers described the interpersonal interactions within the teaching consultation and group 2 papers described the socio-cultural spaces of learning which shape those interactions.

Group 1 papers emphasised the importance of the GP as a broker who influenced the triadic/dyadic interactions between patients and students through setting the stage of the teaching consultation, maintaining a scaffolding for learning during the teaching encounter and facilitating patient consent for participation in teaching. Flat hierarchies and enabling participatory learning is beneficial for the student and for the patient.

Group 2 papers represent qualitative research exploring the socio-cultural spaces of learning that shape and provide boundaries for the interpersonal interactions which occur within the teaching consultation. These papers suggest that students need to negotiate between the two apparently polarised environments of hospital and general practice teaching, and act to integrate the knowledge and learning of these competing cultures. General practice was seen as a setting where students could make links between affective, cognitive and practical aspects of learning. However, students feel a tension between the 'real world' medical training offered in general practice with the 'textbook medicine' offered in the

hospital setting and which students felt dominated their exams and assessments.

Bringing these two groups of papers together, it is the features of the 'good'; the good GP, the good student and the good patient that enable meaningful interactions between the participants in the teaching consultation and develop inclusive and supportive socio-cultural spaces of learning.

### Discussion of costs of undergraduate medical education in general practice

Only 7 papers refer to costs from the 169 papers included in the review, and this limits our ability to complete a meaningful analysis of the overall costs of providing undergraduate medical education in general practice. Firstly, the studies identified in this review reporting cost were published from 1993 to 2001; the two most recent papers were published over a decade ago, and it is likely that the processes of payment have changed in the intervening years. Secondly, the cost data provided is not comparable between papers. Lastly, the information provided in the papers is not detailed enough to allow us to fully describe the costs of general practice placements.

### Limitations of this review

#### *Limitations of the papers included in this review*

Papers entering the descriptive review included those using subjective and non-validated outcomes such as satisfaction surveys, which sometimes had low response rates. In terms of the quantitative in-depth synthesis, the papers comparing learning outcomes in the general practice setting with the hospital setting are over a decade old. While this does not in itself limit the validity of the findings, the applicability of the results in an evolving and changing medical education environment need to be considered carefully. Additionally, all but one of the papers informing the quantitative in-depth synthesis were conducted at one medical school (University College London), which means that the generalisability of the findings may be limited.

#### *Limitations in our approach to the review*

Our approach to conducting this review has several limitations. Firstly, we only considered research conducted in the United Kingdom, excluding research from other countries with similar general practice and/or medical education perspectives. The overall findings of this review, however, may be transferable to other international medical education settings. Secondly, although we comment on the comparisons between hospital and general practice teaching settings in this review, we did not include research conducted solely in the hospital setting. This approach may have limited our perspective on teaching in hospitals when we discuss how students, teachers and patients experience teaching in general practice compared to the hospital setting. Lastly, in the meta-ethnography, we have considered only patient and student perspectives, and did not include teacher/GP or organisational perspectives. We did identify two 'key' teacher/GP perspective papers when conducting the meta-ethnography quality assessment (Sandars

& Boreham 2002; Cook 2009), however these papers focus upon teacher training needs, general practice infrastructure and the challenges of working as a teacher in the general practice setting. These two 'key' GP/teacher papers, therefore, did not consider the experiences of students and patients, which was the overarching focus of the meta-ethnography.

### Implications for policy, practice and research

We present the main implications of this review in terms of the implications for policy, practice and research. These implications are summarised in Box 2, available online as supplementary material.

#### *Implications for policy*

There is an increasing shift both in undergraduate and postgraduate medical education to provide training in community settings outside of the hospital environment (Whitehouse et al. 1997; GMC 2009; Anon 2014). With a transition to large scale education in general practice and the community, it is becoming increasingly important to consider issues of quality and resource, and how to implement good quality and cost-effective training in this setting.

This review has summarised current evidence on the quality of general practice teaching, which has been shown to be as effective, if not better, than hospital teaching when it is adequately resourced. However, the current cost of delivering undergraduate medical education in general practice is unclear. Future policy makers might benefit from a clear description of these costs, and a comparison with the cost of providing medical education in secondary and other community-based settings when planning curricula.

#### *Implications for practice*

This review has shown that teaching in general practice is valued by students, patients and GP tutors. Students identify several benefits of learning in a general practice setting, however, our meta-ethnography highlighted the perceived difference in general practice and hospital cultures. Students may require support to negotiate these challenges and opportunities across organisational boundaries. One paper suggests that in order to achieve a meaningful understanding of hospital and general practice environments, students need to broaden their understanding of what constitutes knowledge following 'an appropriate lead from their teachers' (Mattsson et al. 1991).

The in-depth quantitative outcome analysis shows that students learn clinical skills in the general practice setting as well as in the hospital setting. However, the success of general practice teaching requires thought, adequate training for tutors and financial and intellectual resources. This may have implications for curricular development.

GP tutors are important brokers of the interactions between student, patient and teacher. Patients are transient members of this learning community and their meaningful involvement requires careful and supportive facilitation. GPs should be aware of the potential for patients to feel embarrassed, anxious or objectified when taking part in teaching consultations.

Promoting legitimate membership for patients to the community of practice within the teaching encounter may help to limit these negative ideas and feelings.

#### *Implications for research*

Our review has identified research since 1990 considering the effectiveness and quality of undergraduate medical education in the UK. Following on from our synthesis of the current research, we propose the following implications for future research.

Firstly, in terms of evaluating the effectiveness of general practice medical education in general practice, the trials comparing student behavioural and cognitive outcomes have demonstrated how general practice teaching is as good as hospital teaching. Although future experimental trials or RCTs may provide new data and information on the effectiveness of general practice teaching, our recommendation is that future research should broaden out from RCTs. Future research on the effectiveness of general practice medical education might take advantage of routinely collected data; medical students are routinely assessed, and there is scope for large scale research encompassing the variation in medical school curriculums and strategies to determine how well students learn skills during their general practice placements.

Secondly, the question of cost was not fully addressed by available empirical papers. Our review suggests that in terms of quality, the teaching is equivalent, but no comprehensive cost-effectiveness studies have been undertaken to date. Economic modelling might inform future understanding of the cost of general practice education.

Thirdly, 10 qualitative studies were included in the in-depth meta-ethnography of qualitative papers. These are beginning to contribute to debate about considerations for patient of participation in medical education and further work is required in this field to develop these understandings.

## Conclusions

We identified 169 empirical papers from 1990 about undergraduate medical education in the UK general practice setting. We have produced three substantial analyses: a descriptive review of all included papers; and two in-depth reviews of quality-assessed quantitative and qualitative papers. The descriptive review has provided some useful knowledge about the distribution and delivery of teaching reported in this empirical literature, as well as reported perceived benefits and dis-benefits. Through our in-depth review of quantitative papers using comparative, independent outcome measures, we have been able to demonstrate that, when adequately resourced, general practice is as good, if not better, than hospital delivery of teaching of clinical skills in the undergraduate setting. We used meta-ethnography to synthesise the selected qualitative papers. This process has produced rich understandings of the underpinning concepts and theories relating to learning in the general practice setting. These include a deeper understanding of the complex (and often hierarchical) relationships shaping possibilities for student and patient active participation in learning. These also include a

richer appreciation of a variety of perspectives about general practice as a socio-cultural learning space and the potentially complex tensions which students contend between teaching environments. We suggest that policy-makers and curriculum planners might like to pay greater attention to these socio-cultural complexities, as well as supporting teachers to maximise opportunities for patient and student active participation in learning. In terms of further research, projects might usefully address identified gaps in knowledge around cost-effectiveness; use cross-institutional readily available datasets to inform further debates about effectiveness and impact; and develop understandings about patient participation in medical education encounters.

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