

Influences on students' career decisions concerning general practice:

a focus group study

Abstract

Background

Despite concerns about recruitment to UK general practice, there has been no concerted educational intervention to address them.

Aim

To better understand how medical students' perceptions of their experiences of their undergraduate curriculum may affect choosing general practice as a career.

Design and setting

Qualitative study comprising focus groups of a total of 58 students from a range of medical schools across the UK.

Method

A range of UK medical schools students were invited by email to participate in focus groups and return a questionnaire detailing their current career choice to facilitate sampling students with varied career preferences. Students late in their studies were sampled as they were likely to be considering future careers. Focus group discussions were audiotaped, transcribed, and anonymised for both school and participant, then thematically analysed. Perceived differences in medical school culture, curriculum philosophy, design, and intent were explored.

Results

Six focus groups (58 students) were convened. Some student participants' career aspirations were strongly shaped by family and home, but clinical placements remained important in confirming or refuting these choices. High-quality general practice attachments are a powerful attractor to general practice and, when they reflect authentic clinical practice, promote general practice careers. GP tutors can be powerful, positive role models. Students' comments revealed conflicting understandings about general practice.

Conclusion

Attracting rather than coercing students to general practice is likely to be more effective at changing their career choices. Early, high-quality, ongoing and, authentic clinical exposure promotes general practice and combats negative stereotyping. It is recommended that increasing opportunities to help students understand what it means to be a 'good GP' and how this can be achieved are created.

Keywords

career choice; curriculum; general practice.

INTRODUCTION

Primary care is an essential component of sustainable, appropriate, and affordable healthcare systems¹ and, as a key component of UK primary care, general practice is critical to health care in the UK. However, too few young doctors are choosing general practice as a career,^{2,3} it risks a haemorrhage of its existing medical staff,⁴ and it is facing both an unsustainable workload⁵ and political pressure to expand its provision.⁶

Many health economies worldwide face challenges in recruiting sufficient primary care physicians. The US has had a chronic national shortage of family physicians, which is likely to increase as a result of changing demographics and regulation (the Affordable Care Act),^{7,8} while Australia, Canada, and Norway have struggled to recruit sufficient family practitioners to serve rural and remote communities.⁹⁻¹¹ Although there may be differences in the challenges in recruiting primary care medical staff between health economies, there are also similarities, namely:

- too few newly-graduated doctors want to become primary care physicians,^{2,12} and
- primary care is perceived to be an unattractive,¹³⁻¹⁵ or poorly remunerated, career.¹³

Interventions to address the issues

vary. National (Australia¹⁶) and regional (Canada,¹⁷ US,¹⁸ and Norway⁹) initiatives that have adopted a long-term educational approach of embedding medical education and training in underserved communities have been successful in addressing aspects of under-recruitment to primary care. In spite of the long-standing concerns about recruitment to general practice in the UK, there has not been any concerted educational intervention to address it. The proportion of time that a UK medical student spends learning in UK general practice has decreased since 2002¹⁹ and national policy interventions have been limited to a commitment that 50% of training places will be for general practice:³ a target that, to date, has not been achieved.²⁰

In 2011, Barker claimed that 'the future of a sustainable health system would seem to rest in primary care as never before';²¹ if this is true, the number of doctors choosing such a career and what determines the career choices existing doctors make, needs to be very carefully examined.

It has been found that females are more likely to express an intention to enter general or family practice,^{22,23} students and doctors who grew up in a rural environment are more likely to elect to practise in a rural environment,^{24,25} and students' career intentions before entry to medical school affect career intentions in their final year of study.²² Students who specifically express

S Nicholson, PhD, MRCP, head centre for medical education (acting), Institute of Health Sciences Education, Queen Mary University of London, London. **AM Hastings**, MRCP, director of education scholarship, Department of Medical and Social Care Education, University of Leicester, Leicester. **RK McKinley**, MD, FRCP, FRCGP, professor of education in general practice, Keele University School of Medicine, Keele.

Address for correspondence

Sandra Nicholson, Institute of Health Science Education, Barts and The London School of

Medicine and Dentistry, Queen Mary University of London, 3rd Floor Garrad Building, Turner Street, London E1 2AD, UK.

E-mail: s.nicholson@qmul.ac.uk

Submitted: 5 February 2016; **Editor's response:** 9 March 2016; **final acceptance:** 9 May 2016.

©British Journal of General Practice

This is the full-length article (published online 31 Aug 2016) of an abridged version published in print. Cite this article as: **Br J Gen Pract 2016; DOI: 10.3399/bjgp16X687049**

How this fits in

There are currently serious concerns about recruitment to UK general practice. There has been no concerted educational intervention and little is known about the factors helping to shape medical students' career intentions. This article indicates that authentic, early clinical exposure, and positive role models in general practice are important in promoting it as a positive career choice.

intentions to work with disadvantaged or underserved populations are more likely to choose primary care than students not wanting to work with such groups.^{22,25} Goldacre and colleagues have also outlined that those students who state an early primary care preference are likely to retain it.²⁶

Unfortunately, sometimes the ethos of the educational institution, disparaging remarks from hospital colleagues, observation of poor practice, and perceived tedious, uncompetitive paid work discourages students from this pathway.^{22,14} The school's culture is important: students attending schools where primary care as a career is 'badmouthed' are less likely to state they wish to practise in primary care.²² Nevertheless, little is known about the factors that help shape students' career intentions while they are studying.

The curriculum itself may be important: there is some evidence that longitudinal placements²⁷ or community education^{15,22,25} increase the likelihood of a medical student choosing primary care as a career. Medical students make their career choices for a variety of positive reasons, including:

- appropriate role modelling by GPs;
- opportunities for patient contact and good undergraduate experiences; and
- a preference for more flexible working, thereby providing a better work-life balance.²⁸

There is also evidence that the medical school attended may influence career preference, although the underpinning reasons for this are not clear.²⁸

Aims and objectives

The overall aim of this study was to examine how medical students' experiences of the undergraduate medical curriculum may affect choosing general practice as a career as this may facilitate increasing recruitment. This entails exploring both the

perceived encouraging and discouraging aspects of their learning experiences in general practice and in hospitals that may influence their choice. It is also pertinent to explore whether, and how, differences in student perceptions of culture, curriculum philosophy, design, and intent between medical schools may significantly influence students' preferences.

METHOD

Methodology

While this study focused on career choice for general practice, it was considered important to understand both 'pushes' and 'pulls' to and from general practice and other disciplines. The authors therefore aimed to sample students who had made choices:

- for general practice, and
- specifically against general practice, opting for an alternative specialty.

Whether pre-medical school career aspirations affect choice of medical school and the impact of the medical school on their students' career aspirations was also examined. As such, a sampling frame was used that included schools of different types, from different regions, and whose graduates are more or less likely to choose a career in general practice.

Focus groups were chosen to encourage interactive dialogue between students and facilitate an exploration of factors that encourage or discourage them to favour general practice as a career choice. The decision was made to also sample students late in their penultimate or early in their final year of study because they were about to apply, or had just applied, for their foundation (postgraduate year 1) posts and were likely to have been thinking carefully about their careers.

Sampling

A two-level sampling frame was adopted: medical school and individual student participant.

Medical schools. A selection of nine UK medical schools were invited to participate in the study. These included:

- English and devolved nation schools;
- metropolitan or London schools;
- Oxbridge;
- 'redbrick' (19th century civic university);
- 20th-century schools; and
- 21st-century or new schools.

This nomenclature indicates the location, date since establishment, and, possibly, variability in traditions or culture of the medical school.

Students. Recruitment was managed by each school's general practice education team, using the methods they knew to be most effective in contacting and engaging their student body. Students were sent a school-specific participant information leaflet, which was prepared in conjunction with the local general practice education team. If the student was interested in participating, they were requested to return a questionnaire that asked them to stipulate their career choice (Box 1). This asked them to state whether they had:

- already made a definite choice to pursue a career in general practice;
- decided against a career in general practice;
- decided on a clinical discipline; or
- not made a choice so far.

Up to 12 students were invited to a focus group discussion from each school type; there were a maximum of two students in each career choice category except for the final 'no choice yet' category, from which a

maximum of four students were invited to encourage open discussion. One student could represent a choice for one career and against another.

Data collection

Four focus groups were facilitated by one researcher and two by another; both researchers had extensive experience of conducting focus group meetings. Written consent was obtained at the start of each focus group. A topic guide, covering perceived differences in medical school culture, curriculum philosophy, design, and intent, was used, the content of which was informed by a literature review conducted by a third researcher, a focus group pilot, and career intention pilot survey at Leicester University. The focus groups were audiotaped, then transcribed, and checked by a researcher before being anonymised for school and participant.

Analysis

Transcripts were thematically analysed by three researchers; they agreed on a combined empirical coding of data, applying the relevant concepts that had been identified previously from the literature. Analysis was conducted across and within all cases to examine all the issues the authors wished to explore; this is in line with Huberman's suggested methodology for qualitative research.²⁹ Later focus groups were used to test earlier tentative findings, thus aiding the validity and reliability of any conclusions.

RESULTS

From the nine schools contacted six agreed to take part. All students from the penultimate year were invited and overall 58 students agreed to participate. Six focus groups, were convened in the different medical school:

- Oxbridge ($n = 6$ students);
- devolved nation ($n = 8$ students);
- redbrick university ($n = 17$ students);
- metropolitan or London-based ($n = 6$ students);
- 20th-century school ($n = 13$ students); and
- 21st-century school ($n = 8$ students).

It was not possible to sample an exclusively graduate-entry school as they declined to take part.

In the focus groups, the following themes were identified:

- prior influencing concepts (personality, experience, or family);

Box 1. Participant questionnaire of what influences medical students in deciding for or against a career in general practice

Participant questionnaire

Given name		Family name	
Email address			
Career choice	Yes	No	
I have decided I want to be a GP			
I have decided I do not want to be a GP			
I have decided I want to be a specialist			
If yes, please state the specialty you have chosen			
I have decided against a specialty			
If yes, please state the specialty you have decided against			
I have made no firm decisions about my career			

Please email to XX@XX.ac.uk within 1 week.

- curriculum experiences (positive and negative perceptions, or role modelling);
- conceptualisation of general practice as a specialty;
- medical school culture (overall and specific to individual schools); and
- catalysts for change.

In exploring each theme, typical illustrative quotations are provided.

Prior influencing concepts

Student participants had views about what kinds of personalities best suited a general practice or a hospital career:

'I think certain personalities are better suited for GPs. I think my personality is perhaps more GP related. I'm a bit more sensitive. I'm not, like, ruthless. I think you have to be quite ruthless and ambitious genuinely to be in hospitals.' [21st-century school, page [p]18]

These views may have been affected by participants' experiences as medical students, and reflect their perceptions of the differences between hospital and general practice.

Although some students' career aspirations are strongly shaped by their family and home environment, clinical placements remain important in confirming or refuting these choices:

'I liked the rotation, but nothing clicked. But I found [the rotation] quite hard and seeing sick children was ... I didn't like that and parents are so demanding. It wasn't something that I would want to do all the time ... but [general practice is] a bit of everything rather than just into paed, so yes, [my career preference] completely changed.' [21st-century school, p3]

Curriculum experiences

High-quality general practice attachments are a powerful attractor:

'... the sole reason I want to be a GP is because I've had exposure to general practice.' [Redbrick school, p20]

Students' perceptions of the quality of the placement and their understanding of general practice as a career were driven by the authenticity of their experience rather than by the formal curriculum:

'If you get a good GP then you're inspired by them. During a 4-week block of [general practice] you actually get responsibility,

you get to run your own clinic, you see patients, and you can see the continuity with a GP. I think that is a big influencing factor.' [Oxbridge, p10]

'... we get our own clinic this time so we make our own decision, you feel like you've got a little bit more authority, like more trust in you. For that reason you think "I could do this".' [20th-century school, p8]

'When I'm in hospitals I'm always just an observer. I haven't been taking part in anything, but with [general practice] I can actually imagine myself in the role because I was given an opportunity to sort of "play act" in that role. I think that's what made me want to do [general practice] even more, because I could see myself doing it because I had that experience.' [21st-century school, p13]

Although teaching in general practice was valued overall, it was perceived to be most useful if it reflected authentic clinical practice. In addition, if it wasn't perceived to be authentic, it didn't promote general practice as a career:

'... they brought in patients related to the topic we're learning about, which is really good ... you want to see patients to do with the topic that you need to learn about. However ... in regards to choosing [general practice] or not, I don't think it helps.' [21st-century school, p15]

It was anticipated that positive or negative placement experiences would affect career choice; this was highlighted by some participants:

'If you only ever get rubbish GPs, then you're going to hate it, and not learn very much from it, and find it boring, and pointless. Whereas, when you have a good GP, and you can see the difference they're making, and they're teaching you, and you're getting loads of good experiences, then you really enjoy it, and you see how valuable and worthwhile it is.' [Metropolitan school, p28]

Students clearly articulated the central role of the GP tutor in both providing an excellent clinical service and supporting active learning, highlighting the importance of positive and negative role models (both GPs and others):

'Seeing patients on home visits, caring for patients who were nearing the end of their lives ... it just seemed to me that it was really rewarding and, again, the inspirational

teachers, the GP tutor we had, she was an absolutely amazing GP.' (21st-century school, p5)

Conceptualisation of general practice as a specialty

'GP land? Why does everyone call it GP land?' (Metropolitan school, p17)

Students' comments revealed not only what they individually, and as groups, thought about general practice, but also what they perceived others (such as hospital consultants and university supervisors) thought about general practice as a career. 'GP land' is seen as something quite distinct and separate from hospital medicine. Students' comments revealed sometimes conflicting understandings about general practice; for example, they highlighted a sense of isolation, of 'having to do it on your own' as a GP, but also valued opportunities to 'work within a multidisciplinary team':

'I was quite surprised about what being a GP is like. I thought it was really good, to be honest. Everyone was looking out for the patients, everyone shared information, they were really interested in helping everyone become healthier, moving forwards, and just doing it in really collaborative ways because, basically, as a GP you're on your own. I saw how it could be at its best, so, yeah, I want that.' (Oxbridge, p14)

Some students had concerns about becoming 'good GPs', and considered general practice a difficult and demanding role, which they would only want to do if they felt they could do it well:

'I think what's more important than saying "I want to be a GP" is saying "I want to go out there and become a good GP". You hear it in hospital medicine all the time: "Oh, the GP referred ..." you know what I mean? It would be lovely to be known as a good GP.' (21st-century school, p19)

That student highlighted the negative impression that hospital culture sometimes portrays of general practice and GPs. However, students themselves described examples of what they perceived as both good and bad practice:

'Good GPs made the patients so much happier. They left knowing exactly why the decision was made, they felt like they'd been given an appropriate amount of time, had everything weighed up, examined. The

patients were more satisfied.' (Metropolitan school, p28)

'[They] just give patients things, and patients don't know what they're taking, how to take it, what's wrong with them, or [they] don't really prescribe anything.' (Metropolitan school, p33)

Students' perceptions of appropriate role models emphasised what they thought made a good GP and, for them, actively wanting to be a GP rather than just choosing general practice by default, appeared important:

'... what I learned was that you've got to really want to be a GP to be a GP. At my last GP practice I went to, they all wanted to do something else and they just kind of fell into being GPs, and they'd just call their patients in and go "oh, this is another heart-sink patient".' (21st-century school, p17)

'... because there's a saying, isn't there, that it's easy to do the job badly, but it's hard to do it well as a GP. So I think ... she just did it amazingly and that's kind of an inspiration to me.' (21st-century school, p3)

Further conflicting conceptualisations of general practice that were outlined were that it is seen as both boring due to the lack of perceived autonomy and interesting patients; and stressful because of the workload. Students also perceived that general practice may act as a fallback:

'You can progress along another way and then if you decide that you don't like it, you can drop into [general practice] relatively easily. So when people ask me what I want to do, I wouldn't say [general practice], even though it's pretty high up on my list, because it's not primarily [sic]. I'll go for something and if that doesn't work out or I don't like the lifestyle aspects, I'll drop into [general practice] as a sort of back-up — which sounds a little bit derogatory. I think it's the way that quite a few medical students think.' (21st-century school, p4)

Medical school culture

Many students perceived from their first year that they were being pushed into general practice:

'One of the first things they always let us know is that 80% of people become GPs, and that really annoyed me. How can you decide that in my first year? You can't just force me into something that I don't want to do, and I think that's always been a strong

driver for me to not be a GP.' (21st-century school, p12)

'It will start with the lecturer coming in going "well, you know, at least 50% of you are going to be a GP ..." They're almost dismissive, like half of you don't really need to be here ... It makes you feel like you've no longer got a choice.' (20th-century school, p27)

This illustrates that some students felt coerced into general practice and perceived that medical schools may act as 'GP factories', an impression that can be reinforced by how students may (mis)interpret the curriculum:

'I think PBL [problem-based learning] is a [general practice]-based course ... I think sometimes they try too hard. For all the exam questions, you are a trainee GP in what you do and it's like they want us so much to be GPs.' (Redbrick, p18)

'There appears to be a very [general practice]-driven curriculum ... And yet, at the same time, there's an awful lot of criticism at GPs when you're in hospital. It's drilled into you a bit negatively. And, actually, I always enjoy [general practice].' (Metropolitan school, p14)

Although many medical students will ultimately practise as GPs, the way this message is delivered sets their expectations and their perceptions of the value of general practice.

Unfortunately, as the comments above and below illustrate, general practice isn't consistently valued by the medical school culture:

'... but there is a vibe that I get that general practice is bad, hospital medicine is good, and academic hospital medicine is the best, and that's how it's ranked.' (Oxbridge, p11)

It appears that such impressions are fostered by both the student body and staff:

'It comes from the year group more than the clinical school and I certainly feel like it's quite anti-public health and anti-[general practice]. Someone said they wouldn't consider choosing [general practice] because it would be like wasting their medical degree. People can vocalise that opinion and it's seen as funny. However, it's interesting as you move on and we see what [general practice] is. More people are open to admitting it [an interest in general practice as a career].' (Oxbridge, p10)

Catalysts for change

Unsurprisingly, students felt negatively about suboptimal experiences that were sometimes a stronger influence on decision making than positive experiences:

'The kinds of supervision or the learning support that you get can definitely put people off.' (21st-century school, p11)

However, positive authentic clinical experiences in general practice can be an important contribution to students changing their minds:

'I kind of discounted [general practice] for quite a while, not that I had bad experiences, but just because nothing had really clicked. But then on my last attachment, I felt a lot more involved than previously. I think it was seeing how to go beyond just following some prescribed pathway, that you can actually do more than that.' (21st-century school, p5)

DISCUSSION

Summary

These data demonstrate the complexity of students' decision making with regard to careers. Pre-medical school career intentions formed by personal and family experience can be powerfully reinforced by students' (mis)interpretations of the rationale driving their curriculum and messages from the school. High-quality clinical experience and authentic placement in general practice can be a strong attraction to general practice as a career. Negative role models are powerful repellents, while positive role models are attractants to careers in general practice: although the challenges involved in being a 'good GP' was clearly articulated by students.

There is a powerful perception of a hierarchy of careers, with general practice at the bottom. This appears to be perpetuated by both the student body and the behaviours of clinical and academic staff.

Strengths and limitations

Unexpectedly no great differences were found between schools with regard to students' perceptions of general practice, even though it is known that the proportion of graduates who choose general practice varies dramatically between schools.² It may be that there is insufficient data here to demonstrate such a finding and that more focus groups, or alternative methodologies, would be required to explore this fully. It may also be because participants were recruited through the GP educator group in each

Box 2. Recommendations to increase the attractiveness of general practice as a career

For medical schools

- *Increase authentic exposure to general practice, both as early experiences and later in the course.* Early on, create opportunities to observe a GP consulting and, individually or in pairs, to meet patients. Later in the course, the authentic learning experience requires opportunities to consult one-to-one with patients before attempting appropriate supervised autonomy, undertaken through apprenticeships^{30,31} and student clinics.
- *Convey what it means to be a 'good GP' and show that this is achievable.* Appropriate scaffolding³² by, for example, promoting contact between students and GPs in training. GP teachers 'unpicking' their clinical reasoning for students to scaffold their own learning is likely to be helpful. This is difficult and may require additional faculty development.³³
- *Adopt zero tolerance of any form of 'discipline bashing'.* Further effort should be directed at understanding 'GP-ism' (stereotyping or prejudice against general practice as a clinical specialty), but a concerted effort must be made to avoid personal and institutional undermining of GPs and the practice of primary care, and ascertain how to counteract it effectively. These data and those of others^{14,22} demonstrate its pernicious effects.

For general practice clinical tutors

- *Project a positive role model.* In the current climate, this may be exceptionally challenging when morale is so low but, when supervising students, GP tutors need to consider how to meaningfully demonstrate team working: when observed, this seems to be viewed as a positive aspect of general practice. An effort should also be made to highlight how GPs can effectively work in teams and positively with secondary care colleagues. This relates particularly to preventing academic stagnation and is a means of maintaining the quality of clinical practice.³⁴ How GPs keep up to date and develop through appraisal and continuing professional development are opportunities for students to learn both about general practice and how to be a successful GP.

with the very best educational opportunities in general practice that can encourage a positive career choice.

Comparison with existing literature

Some of the factors noted here — such as personality, how medical schools value general practice, and what affect clinical placements have on students' career preferences — have been discussed in other studies, although conclusions are sometimes limited.^{13,14,22,24–28} However, this study adds to our understanding of why and how early, good, ongoing and, importantly, authentic clinical exposure within community settings is important in promoting general practice as a career option.

Although early clinical exposure to general practice can contextualise students' basic science learning, it also helps them understand what general practice is and how it works. This appears to be important in combating any negative stereotyping about general practice encountered by students. Furthermore, for those students in this study's sample who only experienced general practice later on in their curricula, such exposure was sometimes seen as a catalyst for positively changing their views about a career in general practice.

Implications for research and practice

Although these data demonstrate the complexity of career decision making, it is possible to make a number of firm recommendations for both schools and the general practice discipline to increase the attractiveness of it as a career; these are outlined in Box 2.

Research that explores in more depth why some medical schools have larger numbers of students choosing careers in general practice is required. Is it the impact of the curriculum, the culture of the school, or the students that choose to go to those schools? If what motivates students in choosing their careers is better understood, then it will be easier to change accordingly.

It seems critical at this time to further explore how to most effectively convey what it means to be a good GP and to raise students' awareness of the value of patient-centred general practice as the bedrock of the NHS.

school and, as such, students who were accessed may have been those who were more disposed to general practice; although the illustrative quotations demonstrate that they had both positive and negative views.

This study comprising students across purposive samples of UK schools provides nuanced, sometimes conflicting, conceptualisations of general practice and being a GP. The data were gathered by experienced researchers using a topic guide informed by a prior literature review; nevertheless only 58 students that were recruited by the schools' GP educator groups participated, and the extent to which their ideas are represented within the whole student body is not known.

It has only been possible to access students' perceptions of the rationale of their curricula and the intentions driving comments by school staff. Furthermore, students have limited experience of other schools' curricula and, although some did compare and contrast their experiences with their perceptions of those of others in different institutions, most students' views originated from personal experiences. However, such a finding highlights the importance of providing medical students

Funding

This study received £5000 to support research costs from the Society for Academic Primary Care.

Ethical approval

The study was reviewed and given research ethics approval by the Keele University School of Medicine Research Ethics Committee.

Provenance

Freely submitted; externally peer reviewed.

Competing interests

The authors have declared no competing interests.

Acknowledgements

The authors thank the study participants, GP educator groups in each of the participating schools who helped with student recruitment, Dr Paul MacIntosh who conducted four of the six focus groups and checked the transcripts. The authors also thank Sue Hastings for giving permission for us to include Adrian M Hastings as a posthumous author.

Discuss this article

Contribute and read comments about this article: bjgp.org/letters

REFERENCES

1. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Q* 2005; **83**(3): 457–502.
2. Lambert T, Goldacre M. Trends in doctors' early career choices for general practice in the UK: longitudinal questionnaire surveys. *Br J Gen Pract* 2011; DOI:10.3399/bjgp11X583173.
3. Department of Health. *Health Education England Mandate: April 2014 to March 2015*. 2014. <https://www.gov.uk/government/publications/health-education-england-mandate-april-2014-to-march-2015> [accessed 17 Aug 2016].
4. Knapton S. GP crisis looming as half of family doctors plan to leave profession before 60. *Daily Telegraph* 2015; **2 Mar**: <http://www.telegraph.co.uk/news/science/science-news/11442987/GP-crisis-looming-as-half-of-family-doctors-plan-to-leave-profession-before-60.html> [accessed 17 Aug 2016].
5. British Medical Association. *Quarterly tracker survey Q1 2015*. <https://www.bma.org.uk/collective-voice/policy-and-research/education-training-and-workforce/tracker-survey/tracker-survey-results/omnibus-survey-january-2015> [accessed 17 Aug 2016].
6. Hunt J. *New Deal for General Practice. Jeremy Hunt sets out the first steps in a new deal for GPs*. <https://www.gov.uk/government/speeches/new-deal-for-general-practice-dh>, 2015. [accessed 17 Aug 2016].
7. Frisch S. The primary care physician shortage. *BMJ* 2013; **347**: f6559.
8. Petterson SM, Liaw WR, Phillips RL Jr, et al. Projecting US primary care physician workforce needs: 2010–2025. *Ann Fam Med* 2012; **10**(6): 503–509.
9. Straume K, Shaw DM. Effective physician retention strategies in Norway's northernmost county. *Bull World Health Organ* 2010; **88**(5): 390–394.
10. Viscomi M, Larkins S, Gupta TS. Recruitment and retention of general practitioners in rural Canada and Australia: a review of the literature. *Can J Rural Med* 2013; **18**(1): 13–23.
11. Joyce CM, McNeil JJ, Stoelwinder JU. More doctors, but not enough: Australian medical workforce supply 2001–2012. *Med J Aust* 2006; **184**(9): 441–446.
12. Chen C, Petterson S, Phillips RL, et al. Toward graduate medical education (GME) accountability: measuring the outcomes of GME institutions. *Acad Med* 2013; **88**(9): 1267–1280.
13. Morra DJ, Regehr G, Ginsburg S. Medical students, money, and career selection: students' perception of financial factors and remuneration in family medicine. *Fam Med* 2009; **41**(2): 105–110.
14. Evans J, Lambert T, Goldacre M. GP recruitment and retention: a qualitative analysis of doctors' comments about training for and working in general practice. *Occas Pap R Coll Gen Pract* 2002; **83**(iii–vi): 1–33.
15. Thistlethwaite J, Kidd M, Leeder S, et al. Enhancing the choice of general practice as a career. *Aust Fam Physician* 2008; **37**(11): 964–968.
16. Worley P, Murray R. Social accountability in medical education — an Australian rural and remote perspective. *Med Teach* 2011; **33**(8): 654–658.
17. Strasser R, Neusy A-J. Context counts: training health workers in and for rural and remote areas. *Bull World Health Organ* 2010; **88**(10): 777–782.
18. Smucny J, Beatty P, Grant W, et al. An evaluation of the Rural Medical Education Program of the State University of New York Upstate Medical University, 1990–2003. *Acad Med* 2005; **80**(8): 733–738.
19. Harding A, Rosenthal J, Al-Seaidy M, et al. Provision of medical student teaching in UK general practices: a cross-sectional questionnaire study. *Br J Gen Pract* 2015; DOI:10.3399/bjgp15X685321.
20. Rimmer A. A third of GP training posts are vacant after first recruitment round. *BMJ Careers* 2015. http://careers.bmj.com/careers/advice/A_third_of_GP_training_posts_are_vacant_after_first_recruitment_round [accessed 17 Aug 2016].
21. Barker R. *2030 — The future of medicine: avoiding a medical meltdown*. Oxford: Oxford University Press, 2011.
22. Erikson CE, Danish S, Jones KC, et al. The role of medical school culture in primary care career choice. *Acad Med* 2013; **88**(12): 1919–1926.
23. Kruschinski C, Wiese B, Eberhard J, Hummers-Pradier E. Attitudes of medical students towards general practice: effects of gender, a general practice clerkship and a modern curriculum. [In German]. *GMS Z Med Ausbild* 2011; **28**(1): Doc16.
24. Laven G, Wilkinson D. Rural doctors and rural backgrounds: how strong is the evidence? A systematic review. *Aust J Rural Health* 2003; **11**(6): 277–284.
25. Viscomi M, Larkins S, Gupta TS. Recruitment and retention of general practitioners in rural Canada and Australia: a review of the literature. *Can J Rural Med* 2013; **18**(1): 13–23.
26. Goldacre MJ, Laxton L, Harrison EM, et al. Early career choices and successful career progression in surgery in the UK: prospective cohort studies. *BMC Surg* 2010; **10**: 32.
27. Pfarrwaller E, Sommer J, Chung C, et al. Impact of interventions to increase the proportion of medical students choosing a primary care career: a systematic review. *J Gen Intern Med* 2015; **30**(9): 1349–1358.
28. Cleland JA, Johnston PW, Anthony M, et al. A survey of factors influencing career preference in new-entrant and existing medical students from four UK medical schools. *BMC Med Educ* 2014; **14**: 151.
29. Huberman AM, Miles MB. *The qualitative researcher's companion*. Thousand Oaks, CA: Sage Publications, 2002.
30. General Medical Council GM. *Outcomes for graduates*. http://www.gmc-uk.org/education/undergraduate/tomorrows_doctors_2009.asp [accessed 17 Aug 2016].
31. McKinley RK, Bartlett M, Coventry P, et al. The systematic development of a novel integrated spiral undergraduate course in general practice. *Educ Prim Care* 2015; **26**(3): 189–196.
32. Vygotsky L. *Thought and language*. Boston, MA: MIT Press 1986.
33. Bartlett M, Gay SP, List PA, McKinley RK. Teaching and learning clinical reasoning: tutors' perceptions of change in their own clinical practice. *Educ Prim Care* 2015; **26**(4): 248–254.
34. Landström B, Mattsson B, Rudebeck CE. A qualitative study of final-year medical students' perspectives of general practitioners' competencies. *Int J Med Educ* 2011; **2**: 102–109.