ABSTRACT

Objectives It is well recognised that women are underrepresented in clinical academic posts. Our aim was to determine which of a number of characteristics—notably gender, but also ethnicity, possession of an intercalated degree, medical school attended, choice of specialty—were predictive of doctors’ intentions to follow clinical academic careers.

Design Questionnaires to all UK-trained medical graduates of 2005 sent in 2006 and again in 2010, graduates of 2009 in 2010 and graduates of 2012 in 2013.

Results At the end of their first year of medical work, 13.5% (368/2732) of men and 7.3% (358/4891) of women specified that they intended to apply for a clinical academic training post; and 6.0% (172/2873) of men and 2.2% (111/5044) of women specified that they intended to pursue clinical academic medicine as their eventual career. A higher percentage of Asian (4.8%) than White doctors (3.3%) wanted a long-term career as a clinical academic, as did a higher percentage of doctors who did an intercalated degree (5.6%) than others (2.2%) and a higher percentage of Oxford graduates (8.1%) than others (2.8%). Of the graduates of 2005, only 30% of those who in 2006 intended a clinical academic career also did so when re-surveyed in 2010 (men 44%, women 12%).

Conclusions There are noteworthy differences by gender and other demographic factors in doctors’ intentions to pursue academic training and careers. The gap between men and women in aspirations for a clinical academic career is present as early as the first year after qualification.

INTRODUCTION

Internationally, recruitment to clinical academic posts can be difficult; sometimes there are too few excellent candidates for available jobs. It is also well recognised that, at least in the USA and Europe, women are underrepresented in clinical academic posts and in leadership positions in academic medicine.

In addition to the concerns about the under-representation of women, other concerns in the UK include the fact that the clinical academic workforce is ageing with possible shortfalls in its succession; the possibility of a reduction in numbers of medical students taking intercalated degrees (science degrees taken during the years of study for the medical degree); immigration restrictions on academics from outside the European Union; and the lack of flexible working patterns that might otherwise encourage more women into clinical academia. In the USA, the number of women academic physicians increased between 1997 and 2008, but by 2008 women were still underrepresented in senior academic positions. In the UK, there was a similar increase in the number and percentage of women clinical academics between 2004 and 2012, but, in 2012, just 28% of all clinical academics were women and only 16% of professors were women. A US study found that only 17.5% of editorial board members are women and women are less likely to be senior authors in peer-reviewed British journals. In 2007, the UK Women in Clinical Academia Working Group recommended greater flexibility for clinical academics (career breaks, ability to work less than full time), more encouragement for women to take up leadership positions and more visible role models and mentors. These, and other initiatives, such as return to work grants, may be having an impact in increasing the numbers of women in clinical academia, but there is also a cohort effect on increasing numbers with more women doctors graduating from medical school than ever before.

Doctors in the UK who undertake an intercalated degree gain an advantage over those who do not when competing for jobs. There is also evidence that doctors who hold an intercalated degree are more likely to pursue an academic career. Despite the benefits of taking an intercalated degree, there is concern that fewer students are doing so. The reasons for this include not wishing to study for an extra year or to incur more student debt.

In box 1, we have summarised the progression of training and careers in clinical academic medicine, including the current use of terminology, in the UK. In multipurpose national surveys of the graduates of 2005, 2009 and 2012 from all UK medical schools, we asked about future career intentions including doctors’ intentions about entering clinical academic medicine. Our aim in this paper is to determine which of a number of characteristics—gender, ethnic group, medical school attended, possession of an intercalated degree—were predictive of doctors’ intention to follow a clinical academic career.

METHODS

The surveys

We surveyed the UK medical graduates of 2005, 2009 and 2012 one year after qualification and surveyed the graduates of 2005 three years after qualification in 2010. Questionnaires were sent to all medical graduates from every UK medical school,
Some UK medical students undertake a science degree in parallel with their medical degree. This is called an intercalated degree. These students typically take a further year to graduate with their medical degree. A higher proportion of them subsequently apply for clinical academic training than of those who do not undertake an intercalated degree. It is also possible to do a short placement in clinical academia after graduation, and prior to committing for specialist training. This may help the doctor to decide whether to train as a clinical academic.

Clinical academic training is a distinct, separately structured training programme. It includes a substantial research component alongside clinical training in the chosen clinical specialty. Doctors in academic training are typically called ‘academic fellows’. Clinical academics typically have an academic job title and employer (eg, lecturers, senior lecturers and, as they progress, readers and professors employed by universities). These job titles are usually held in parallel with a clinical service job title and role (eg, specialist registrar, consultant, general practitioner (GP) in the National Health Service (NHS)).

Holders of career grade posts in the NHS in the UK, who are in posts that are not primarily academic, may, nonetheless, have an academic component of their work; indeed, some will hold honorary academic university contracts. With or without honorary academic contracts, many doctors will do at least a small amount of teaching, and some will also undertake research. We have categorised the career intentions of the respondents to our surveys in five groups, namely clinical academic posts (those employed primarily as lecturers, senior lecturers, readers, professors), clinical service posts without teaching or research, clinical service posts with some teaching responsibility, clinical service posts with some research time and clinical service posts with some teaching and research.

Respondents to our surveys will be aware of the UK distinction between clinical academic posts, which are typically university posts, and clinical service posts (generally, in the NHS) with a research or teaching component that are not clinical academic posts.

Clinical academics are responsible for teaching the undergraduate curriculum and make substantial contributions to postgraduate medical training in addition to undertaking medical research.

The questions
We asked the cohorts of 2005 and 2012, “Have you applied for an academic F2 placement?” (yes or no). We asked all cohorts two further questions about their intentions regarding academic medicine. The first was ‘After F2, do you intend to apply for an academic training post?’ (answers were chosen from: yes-academic specialist, yes-academic GP, no or undecided). The second was ‘If you intend to practise medicine, in your long-term career do you intend to work mainly in:’ answers were chosen from clinical service posts without teaching or research, clinical posts with some teaching responsibility, clinical posts with some research time, clinical posts with some teaching and research, clinical academic posts and undecided. For analysis for this paper, we recoded the answers to this question into three categories: clinical academic posts, clinical posts with some research (comprising answers of clinical posts with some research time and clinical posts with some teaching and research) and clinical posts without research (comprising answers of clinical service posts without teaching or research and clinical posts with some teaching responsibility). This question was asked again in the study of the 2005 cohort when they were surveyed 5 years after qualification.

All three cohorts were asked, “Have you made up your mind about your choice of long-term career?” with possible responses of definitely, probably or not really. They were also asked about their preferred choice of clinical specialty, or non-medical job if applicable, for their long-term career.

Data analysis
The data were analysed by univariate cross-tabulation. To test statistical significance, we used χ² statistics (reporting Yates’s continuity correction where there was only one degree of freedom), binary and multinomial logistic regression. Only variables that were significant as single variables using univariate analysis were subsequently used in the multivariate analysis; in this, we assessed the individual effect of each variable after allowing for the effects of others. Respondents were grouped according to gender; ethnic group (Asian, White and Other); whether or not they had an intercalated degree; region/type of clinical medical school (England old schools, England new schools, London, Oxbridge, Scotland, Northern Ireland and Wales); and first choice of specialty, grouped as hospital specialties led by physicians, surgical specialties, other hospital specialties combined and general practice.

RESULTS
Response rates
Survey questionnaires were sent to 17 126 UK doctors covering all three cohorts. After excluding doctors who were untraceable, were known to have died or who declined to participate, response rates 1 year after qualification were 63% (3128/4939) for the 2005 cohort, 47% (2918/6250) for the 2009 cohort and 46% (2413/5262) for the 2012 cohort. Forty-nine per cent (2363/4841) of the 2005 cohort responded in year 5. Shortened questionnaires that omitted some questions about academic careers were completed by some respondents; this reduced the number of respondents to 2547 for the 2009 cohort and 2348 for the 2012 cohort.

Intentions to apply for an academic placement in the F2 year
Applications for academic F2 placements were significantly lower among the 2012 cohort (12.4%; 285/2303) than among the 2005 cohort (20.9%; 649/3099) (χ²=67.2, p<0.001). Among the 2005 cohort, 20.0% of women (385/1927) and 22.5% of men (264/1172) applied for academic placements (χ²=2.7, p=0.10). In the 2012 cohort, 9.8% of women (142/1448) and 16.7% of men (143/855) did so (χ²=23.1, p<0.001).
Intentions to apply for an academic training post after F2

Combining all cohorts, 9.5% (726/7623) of respondents intended to apply for clinical academic training after F2, either as an academic specialist in the hospital specialties (7.7%) or as a general practitioner (GP) (1.8%) (table 1). Most respondents (64.3%; 4903/7623) did not wish to do so and the rest (26.2%; 1994/7623) were undecided. The cohorts differed in their responses ($\chi^2=221.7$, p<0.001). Graduates of 2009 were less likely than those of 2005 to choose academic specialist training (6.0% compared with 9.1%). Graduates of 2009 and 2012 were less likely than those of 2005 to choose academic GP training (1.5% compared with 2.5%) and less likely to choose academic specialist training. Taking all cohorts together, responses (men and women differed ($\chi^2=55.7$, p<0.001): a higher percentage of men (13.5%; 368/2732) than women (7.3%; 358/4891) wanted an academic training post (specialist or GP). Men were more likely than women to want to apply for academic specialist training (12.1% men, 5.2% women) and men were less likely than women to want to apply for academic GP training (1.4% men, 2.1% women). Responses from men and women followed a similar pattern in each cohort, but the difference between the percentage of men and women who wanted to apply for academic GP training narrowed in the 2009 and 2012 cohorts.

Long-term career intentions

All cohorts were asked which kind of post they intended to work in for their long-term career. 45.3% (3586/7917) said that they wanted to work mainly in ‘clinical posts with some teaching responsibility’, 35.5% (2807/7917) wanted to work in ‘clinical posts with some teaching and research’, 8.7% were undecided, 3.6% wanted a service post with neither teaching nor research and 3.6% wanted a clinical academic post. Men were more likely than women to want a clinical academic career (6.0% men, 172/2873; 2.2% women, 111/5044; all cohorts combined). Over the three cohorts, 111 female and 172 male respondents intended, 1 year after graduation, to pursue a clinical academic career. Assuming that the respondents are a random sample of the entire cohorts, with respect to intention to work in academia, we estimate that over the whole of the three cohorts, 225 women and 413 men intended to enter clinical academia. Similarly, 1844 women and 1233 men respondents intended to enter a career with some research component (table 2). Scaling these numbers for the whole cohorts, 3738 women and 2962 men intended to undertake research.

Qualifiers of 2009 were less likely to want a clinical academic career (2.5%) than those of 2005 (4.2%) or 2012 (3.9%). Other combinations of career intention are shown in table 2.

Comparison of intentions to pursue an academic career, comparing choices 1 and 5 years after graduation

Of 76 doctors who specified that they wanted a clinical academic career in their replies in year 1, only 23 (30%) did so in year 5. Men were more likely to maintain a choice for a clinical academic career (44%; 19/43) than women (12%; 4/33); $\chi^2=9.1$, p=0.003, table 3. Of 80 doctors who specified in year 5 that they wanted a clinical academic career, only 23 (29%) had done so in year 1; this percentage was higher for men (40%; 19/48) than for women (12%; 4/32); $\chi^2=6.9$, p=0.01, table 3. Other combinations of career preference are shown in table 3.

We also looked at intention to undertake posts that involved teaching, regrouping the data in table 3 into posts with some teaching but no research, posts with both teaching and research and posts without teaching or research. Among those who chose posts with teaching and research in year 1, in year 5, 55% (175/316) of men compared with 42% (179/429) of women also chose posts with both teaching and research; 36% of men and 49% of women chose posts with teaching but no research; and 8% of men and 9% of women chose posts with no teaching.

Intentions to apply for an academic training post after F2: multivariate modelling

We further analysed the factors affecting the choice of academic training after F2 (the data in table 1). Four response categories were reduced to two, by combining those who intended to apply for academic specialist training and GP training into one group and those who did not wish to apply for academic training or were undecided about doing so into a second group. A binary logistic regression model was fitted with ‘intention to apply for an academic training post’ as the dependent outcome, and cohort year, gender, ethnic group, intercalated degree

Table 1

|                  | Yes, academic specialist | Yes, academic GP | No | Undecided | Total |
|------------------|-------------------------|-----------------|----|-----------|-------|
|                  | Male   | Female | Total | Male | Female | Total | Male | Female | Total | Male | Female | Total |
| All              |        |        |       |      |        |       |      |        |       |      |        |       |
| Count            | 330    | 255    | 585   | 38   | 103    | 141   | 1580 | 3323   | 4903  | 784  | 1210   | 1994  |
| Per cent         | 12.1   | 5.2    | 7.7   | 1.4  | 2.1    | 1.8   | 57.8 | 67.9    | 64.3  | 28.7 | 24.7   | 26.2  |
| 2005             |        |        |       |      |        |       |      |        |       |      |        |       |
| Count            | 139    | 119    | 258   | 17   | 53     | 70    | 506  | 1044   | 1550  | 377  | 579    | 956   |
| Per cent         | 13.4   | 6.6    | 9.1   | 1.6  | 3.0    | 2.5   | 48.7 | 58.2    | 54.7  | 36.3 | 32.3   | 33.7  |
| 2009             |        |        |       |      |        |       |      |        |       |      |        |       |
| Count            | 89     | 62     | 151   | 11   | 26     | 37    | 592  | 1282   | 1874  | 171  | 303    | 474   |
| Per cent         | 10.3   | 3.7    | 6.0   | 1.3  | 1.6    | 1.5   | 68.6 | 76.6    | 73.9  | 19.8 | 18.1   | 18.7  |
| 2012             |        |        |       |      |        |       |      |        |       |      |        |       |
| Count            | 102    | 74     | 176   | 10   | 24     | 34    | 482  | 997    | 1479  | 236  | 328    | 564   |
| Per cent         | 12.3   | 5.2    | 7.8   | 1.2  | 1.7    | 1.5   | 58.1 | 70.1    | 65.6  | 28.4 | 23.0   | 25.0  |

GP, general practitioner.
Table 2 Long-term career intention regarding academic training: UK medical graduates of 2005, 2009 and 2012 1 year after graduation

| Clinical service posts without teaching or research | Clinical posts with some teaching responsibility | Clinical posts with some research time | Clinical posts with some teaching and research | Clinical academic posts | Undecided | Total |
|-----------------------------------------------------|-------------------------------------------------|--------------------------------------|-----------------------------------------------|------------------------|-----------|-------|
| Male       | Female | Total | Male   | Female | Total | Male   | Female | Total | Male   | Female | Total | Male   | Female | Total | Male   | Female | Total |
| All        |        |       |        |        |       |        |        |       |        |        |       |       |       |       |        |       |       |
| Count      | 92     | 192   | 284    | 1148   | 2438  | 3586  | 1130   | 167   | 283   | 1148   | 2438  | 3586  | 103   | 167   | 270   | 1130   | 1677  | 2807  |
| Per cent   | 3.2    | 3.8   | 3.6    | 40.0   | 48.3  | 45.3  | 3.6    | 3.3   | 3.4   | 3.6    | 3.3   | 3.4   | 6.0   | 2.2   | 3.6   | 7.9    | 9.1   | 8.7   |
| 2005       |        |       |        |        |       |       |        |       |       |        |       |       |       |       |       |        |       |       |
| Count      | 35     | 61    | 96     | 390    | 834   | 1224  | 466    | 678   | 1144  | 390    | 834   | 1224  | 73    | 55    | 128   | 390    | 678   | 1078  |
| Per cent   | 3.1    | 3.2   | 3.2    | 40.0   | 48.3  | 45.3  | 4.8    | 3.6   | 4.1   | 4.8    | 3.6   | 4.1   | 6.4   | 2.9   | 4.2   | 11.1   | 10.7  | 10.9  |
| 2009       |        |       |        |        |       |       |        |       |       |        |       |       |       |       |       |        |       |       |
| Count      | 30     | 73    | 103    | 375    | 859   | 1234  | 329    | 516   | 845   | 375    | 859   | 1234  | 36    | 26    | 62    | 375    | 516   | 881   |
| Per cent   | 3.6    | 4.4   | 4.1    | 44.4   | 52.3  | 49.6  | 3.8    | 3.0   | 3.3   | 3.8    | 3.0   | 3.3   | 4.3   | 1.6   | 2.5   | 5.1    | 7.4   | 6.6   |
| 2012       |        |       |        |        |       |       |        |       |       |        |       |       |       |       |       |        |       |       |
| Count      | 27     | 58    | 85     | 382    | 745   | 1128  | 335    | 483   | 818   | 382    | 745   | 1128  | 63    | 30    | 93    | 382    | 483   | 865   |
| Per cent   | 3.1    | 3.9   | 3.6    | 43.4   | 49.7  | 47.4  | 1.8    | 3.3   | 2.7   | 3.8    | 3.3   | 2.7   | 6.6   | 8.9   | 8.1   | 6.6    | 8.9   | 8.1   |

We examined how long-term intention to work in posts with no research, clinical posts with some research, clinical posts with some teaching and clinical academic posts varied by six factors: year of graduation, gender, ethnic group, intercalated degree status, medical school region and mainstream career choice (see the Methods section) as predictors (table 4). The multivariate analysis confirmed that men, doctors with intercalated degrees and intending hospital doctors were more likely to want to apply for academic training, than women doctors, and the contrast between Asian and White ethnic groups was more pronounced. Respondents whose first choice of career were signiﬁcant and when all factors were included in the model. For variation in the percentage opting for academic careers differed between the medical school region and medical school type and mainstream career choice (see the Methods section) as predictors (table 4).
DISCUSSION

A smaller percentage of women than men intend to undertake an academic training post and a smaller percentage of women than men want an eventual career in clinical academia. This matches with the actual shortfall of women in clinical academic posts, particularly at senior level. Our study shows that differences between women and men, in these respects, are established very early in the careers of doctors. This said, it is also clear that early intentions about clinical academic careers are not highly predictive of what doctors eventually do. For example, while very similar numbers of 2005 graduates surveyed in year 1 and year 5 intended to follow a clinical academic career, many who comprised the group of aspiring clinical academics in years 1 and 5 were different individuals. It is important that flexibility is maintained in possibilities for switching into (and out of) clinical academic career pathways.

Table 3  Number of doctors by long-term career intention regarding academic work at 1 year and 5 years (2005 cohort)

| Intentions in 2006 | Intentions in 2010 |          |          |          |
|-------------------|-------------------|----------|----------|----------|
|                    | Clinical academic posts | Clinical posts with some research | Clinical posts without research | Total  |
| All               | 23                | 30       | 23       | 76       |
| Clinical academic posts | 45                | 316      | 374      | 735      |
| Clinical posts without research | 12                | 124      | 629      | 765      |
| Total             | 80                | 470      | 1026     | 1576     |

Men

| Intentions in 2006 | Intentions in 2010 |          |          |          |
|-------------------|-------------------|----------|----------|----------|
| Clinical academic posts | 19                | 17       | 7        | 43       |
| Clinical posts with some research | 24                | 139      | 134      | 297      |
| Clinical posts without research | 5                 | 54       | 177      | 236      |
| Total             | 48                | 210      | 318      | 576      |

Women

| Intentions in 2006 | Intentions in 2010 |          |          |          |
|-------------------|-------------------|----------|----------|----------|
| Clinical academic posts | 4                 | 13       | 16       | 33       |
| Clinical posts with some research | 21                | 177      | 240      | 438      |
| Clinical posts without research | 7                 | 70       | 452      | 529      |
| Total             | 32                | 260      | 708      | 1000     |

‘Clinical posts with some research’ comprises ‘clinical posts with some teaching and research’ and ‘clinical posts with some research time’, and ‘clinical posts without research’ comprises ‘clinical posts with some teaching responsibility’ and ‘clinical service posts without teaching or research’; this table does not include those who were ‘undecided’. Quasi-symmetry test results: all: $\chi^2=279.8, p<0.001$; men: $\chi^2=132.1, p<0.001$; women: $\chi^2=122.1, p<0.001$.

Bold denotes doctors whose intentions did not change between 2006 and 2010.

Table 4  Intention to apply for academic training: UK medical graduates of 2005, 2009 and 2012 1 year after graduation by cohort year, gender, ethnic group, intercalated degree status, medical school region and first career choice

| Predictor                       | Intending to apply for academic training | Univariate analysis | Multivariate analysis |
|---------------------------------|----------------------------------------|---------------------|-----------------------|
|                                 | Per cent                               | n/N                 | df | $\chi^2$ | p Value | Wald  | p Value |
| Cohort year                     |                                        |                     | 6  | 221.7    | <0.001  | 17.4  | <0.001  |
| 2005                            | 11.4                                   | 309/2705            |    |          |         |       |         |
| 2009                            | 7.3                                    | 174/2385            |    |          |         |       |         |
| 2012                            | 9.1                                    | 190/2080            |    |          |         |       |         |
| Gender                          |                                        |                     | 3  | 150.8    | <0.001  | 36.2  | <0.001  |
| Men                             | 13.2                                   | 337/2555            |    |          |         |       |         |
| Women                           | 7.3                                    | 336/4615            |    |          |         |       |         |
| Ethnic group                    |                                        |                     | 6  | 152.9    | <0.001  | 20.5  | <0.001  |
| White                           | 8.2                                    | 437/5233            |    |          |         |       |         |
| Asian                           | 13.0                                   | 173/1331            |    |          |         |       |         |
| Other                           | 12.2                                   | 63/516              |    |          |         |       |         |
| Intercalated degree             |                                        |                     | 3  | 209.9    | <0.001  | 26.6  | <0.001  |
| Yes                             | 11.9                                   | 242/2032            |    |          |         |       |         |
| No                              | 7.9                                    | 242/2058            |    |          |         |       |         |
| Medical school region           |                                        |                     | 18 | 268.1    | <0.001  | 50.6  | <0.001  |
| England, old schools            | 8.4                                    | 261/3099            |    |          |         |       |         |
| England, new schools            | 5.5                                    | 273/489            |    |          |         |       |         |
| London                          | 9.0                                    | 149/1648            |    |          |         |       |         |
| Oxbridge                       | 20.8                                   | 86/414              |    |          |         |       |         |
| Scotland                        | 10.4                                   | 101/973            |    |          |         |       |         |
| Northern Ireland                | 10.1                                   | 21/207              |    |          |         |       |         |
| Wales                           | 8.2                                    | 28/340              |    |          |         |       |         |
| First choice of career          |                                        |                     | 9  | 563.3    | <0.001  | 18.6  | <0.001  |
| Hospital medical specialties    | 10.9                                   | 168/1545            |    |          |         |       |         |
| Other hospital                  | 8.5                                    | 211/2478            |    |          |         |       |         |
| General practice                | 6.3                                    | 120/1915            |    |          |         |       |         |
| Surgery                         | 14.1                                   | 174/1223            |    |          |         |       |         |

‘Univariate’ denotes single factor $\chi^2$ test for each predictor. ‘Multivariate’ denotes binomial logistic regression result for each predictor with all other predictors in the model. We excluded cases where one or more predictors were missing, which reduced the sample size from 7623 (see table 1) to 7170.
Doctors of Asian ethnicity were more likely than others to intend to have a career in clinical academia. Doctors who had undertaken an intercalated degree, as well as the medical degree, were more likely than others to want to pursue an academic career. There were also noteworthy differences between medical schools in the likelihood that their graduates wanted an academic career.”19 There was an increase in clinical academic post-holders of 8% between 2006 and 2012 in the UK; the number of UK clinical academics remained steady in 2010–2012, but the number of clinical academics was still 10.8% lower in 2012 than it was in 2000.12

While there was a rise in the number of clinical academics in the UK between 2006 and 2012, our findings indicate that recent graduates may be less likely to contribute substantially to a further rise. A decline in interest in clinical academic careers in recent years has been documented elsewhere.1 20

The number of women doctors on the UK Medical Register grew by 4.3% between 2011 and 2012 compared with 1.5% for men doctors.21 This feminisation of the medical workforce has contributed to a 54% increase in the number of female lecturers between 2004 and 2012, but there is still a gender disparity especially in the more senior roles.12 The feminisation of the workforce may increase the proportion of women clinical academics, but it may have less effect on the proportion of women academia. Three-quarters of academic foundation trainees wanted to work in academia after their foundation programme,18 and ACF trainees report that they are highly motivated by variety in a job, intellectual environment and the challenges of an academic career.19

### Table 5 Long-term career intention regarding academic work: UK medical graduates of 2005, 2009 and 2012 1 year after graduation by cohort, gender, ethnic group, intercalated degree status, medical school region and first career choice

| Predictor          | Group                  | Clinical academic vs no research | Some research vs no research |
|--------------------|------------------------|----------------------------------|-------------------------------|
|                    | N (percentage)         | Univariate analysis              | Multivariate analysis         | p Value | Wald p Value |
| **Cohort**         |                        |                                  |                               |         |
| 2005               | 117 (4.5)              | N/A N/A N/A N/A                  | N/A N/A N/A                  |
| 2009               | 52 (2.4)               | N/A N/A N/A N/A                  | N/A N/A N/A                  |
| 2012               | 76 (3.8)               | N/A N/A N/A N/A                  | N/A N/A N/A                  |
| Total              | 245 (3.6)              | N/A N/A N/A N/A                  | N/A N/A N/A                  |
| **Gender**         |                        |                                  |                               |         |
| Male               | 151 (6.1)              | 4.2 0.05 18.2 <0.001              | 57.3 <0.001                  |
| Female*            | 94 (2.2)               | 4.4 0.001 2.9 0.09               | 0.9 N/A                      |
| Total              | 245 (3.6)              | 54.4 <0.001                      | 37.3 <0.001                  |
| **Ethnic group**   |                        |                                  |                               |         |
| White*             | 165 (3.3)              | 0.8 0.37 19.5 <0.001             | 0.9 N/A                      |
| Asian              | 62 (4.8)               | 1.1 0.28 0.1 0.72               | 0.9 N/A                      |
| Other              | 18 (3.8)               | 2.1 0.10 7.1 0.01               | 0.9 N/A                      |
| Total              | 245 (3.6)              | 54.4 <0.001                      | 37.3 <0.001                  |
| **Intercalated degree** |                |                                  |                               |         |
| Yes                | 157 (5.6)              | 267.5 <0.001                    | 57.3 <0.001                  |
| No*                | 88 (2.2)               | 37.2 <0.001                     | 19.5 <0.001                  |
| Total              | 245 (3.6)              | 54.4 <0.001                      | 37.3 <0.001                  |
| **Medical school region** |            |                                  |                               |         |
| England, old schools* |          |                                  |                               |         |
| London             | 65 (4.2)               | 0.4 0.55 11.7 <0.01             | 0.9 N/A                      |
| Other              | 33 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| Total              | 98 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| England, new schools* |         |                                  |                               |         |
| London             | 65 (4.2)               | 0.4 0.55 11.7 <0.01             | 0.9 N/A                      |
| Other              | 33 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| Total              | 98 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| **Medical school region** |            |                                  |                               |         |
| England, old schools* |          |                                  |                               |         |
| London             | 65 (4.2)               | 0.4 0.55 11.7 <0.01             | 0.9 N/A                      |
| Other              | 33 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| Total              | 98 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| England, new schools* |         |                                  |                               |         |
| London             | 65 (4.2)               | 0.4 0.55 11.7 <0.01             | 0.9 N/A                      |
| Other              | 33 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| Total              | 98 (8.1)               | 20.3 <0.001                     | 37.4 <0.001                  |
| **First career choice** |                  |                                  |                               |         |
| Hospital Medical Spec* |                   |                                  |                               |         |
| Other hospital     | 89 (3.8)               | 0.5 0.47 0.1 0.72               | 0.9 N/A                      |
| General practice   | 15 (0.9)               | 45.2 <0.001                     | 241.6 <0.001                 |
| Surgery            | 68 (5.8)               | 6.2 0.25 16.9 <0.001            | 0.9 N/A                      |
| Total              | 245 (3.6)              | 54.4 <0.001                      | 37.3 <0.001                  |
changing their mind later in their career. In one study of academics who had left academic medicine, reasons for this included a lack of role models, mentors and funding opportunities, poor work-life balance and a biased work environment.22

The feed-through of increasing numbers of women academics from junior to senior roles will increase the number of visible senior role models: this is an important incentive for young women.10 Women working as clinical academics have reported feeling as if they ‘don’t belong’.23 The extent to which academic training posts and long-term research careers can be made more attractive to women needs to be investigated. Others have called for flexibility and work-life integration to be seen as beneficial to a career rather than detrimental.5

The strengths of this study are that the surveys are national, longitudinal and confidential. Because the study is prospective, recall bias about career intentions is not possible. As with all surveys, non-responder bias is possible.

Further study should address the reasons why fewer women than men choose academic training and careers, even when early in their careers. It is important, too, to understand more about why more women than men change their minds about an early choice for academic training and jobs. An early expressed intention to follow an academic career is often not followed through. This may suggest that flexibility in moving into and out of academic training may be helpful to support doctors’ changing intentions in their early postgraduate years. Our findings also suggest that an interest in clinical academic careers, as a possible eventual career destination, may be waning among junior doctors.

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REFERENCES
1. Straus SE, Straus C, Tzanetos K. Career choice in academic medicine: systematic review. J Gen Intern Med 2006;21:1222–9.
2. Sheridan DJ. Reversing the decline of academic medicine. Lancet 2006;367:1698–701.
3. Medical Schools Council. A survey of staffing levels of medical clinical academics in UK medical schools as at 31st July 2011. London: Medical Schools Council, 2012.
4. Buddeberg-Fischer B, Stamm M, Buddeberg C. Academic career in medicine—requirements and conditions for successful advancement in Switzerland. BMC Health Serv Res 2009;9:70.
5. Valentine H, Sandborg C. Changing the culture of academic medicine to eliminate the gender leadership gap: 50/50 by 2020. Acad Med 2013;88:1411–13.
6. Puljak L, Kojundzic SL, Sapunar D. Gender and academic medicine: A good pipeline of women graduates is not advancing. Teach Learn Med 2008;20:273–8.
7. Yu PT, Parsa PV, Hassanain O, et al. Minorities struggle to advance in academic medicine: a 12-y review of diversity at the highest levels of America’s teaching institutions. J Surg Res 2013;182:212–18.
8. Fitzpatrick S. Challenges and opportunities for recruitment to clinical academic medicine and dentistry. London: Medical Schools Council, 2011.
9. Funston GM, Young AMH. Action is required to safeguard the future of academic medicine in the UK. Nat Med 2012;18:194.
10. Medical Schools Council. Women in clinical academia. Attracting and developing the medical and dental workforce of the future. London: Medical Schools Council, 2007.
11. Amrein K, Langmann A, Fahrleitner-Pammer A, et al. Women underrepresented on editorial boards of 60 major medical journals. Gend Med 2011;8:378–87.
12. Medical Schools Council. A survey of staffing levels of medical clinical academics in UK medical schools as at 31st July 2012. London: Medical Schools Council, 2013.
13 Sidhu R, Rajashekhar P, Lavin VL, et al. The gender imbalance in academic medicine: a study of female authorship in the United Kingdom. J R Soc Med 2009;102:337–42.
14 Nicholson JA, Cleland J, Lemon J, et al. Why medical students choose not to carry out an intercalated BSc: a questionnaire study. BMC Med Educ 2010;10:25.
15 Jones M, Hutt P, Eastwood S, et al. Impact of an intercalated BSc on medical student performance and careers: a BEME systematic review: BEME Guide No. 28. Med Teach 2013;35:e1493–510.
16 Lambert TW, Goldacre MJ, Edwards C, et al. Career preferences of doctors who qualified in the United Kingdom in 1993 compared with those of doctors qualifying in 1974, 1977, 1980, and 1983. Br Med J 1996;313:19–24.
17 Goldacre MJ, Davidson JM, Lambert TW. Career choices at the end of the pre-registration year of doctors who qualified in the United Kingdom in 1996. Med Educ 1999;33:882–9.
18 Lyons OTA, Smith C, Winston JS, et al. Impact of UK academic foundation programmes on aspirations to pursue a career in academia. Med Educ 2010;44:996–1005.
19 Goldacre MJ, Lambert TW, Goldacre R, et al. Career plans and views of trainees in the Academic Clinical Fellowship Programme in England. Med Teach 2011;33:e637–43.
20 Borges NJ, Navarro AM, Grover A, et al. How, when, and why do physicians choose careers in academic medicine? A literature review. Acad Med 2010;85:680–6.
21 General Medical Council. The state of medical education and practice in the UK report: 2013. London: GMC, 2013.
22 Levine RB, Lin F, Kern DE, et al. Stories from early-career women physicians who have left academic medicine: a qualitative study at a single institution. Acad Med 2011;86:752–8.
23 Pololi LH, Jones SJ. Women faculty: an analysis of their experiences in academic medicine and their coping strategies. Gend Med 2010;7:438–50.