



# Publication Component of the UK Foundation Programme Application: Perception of Medical Students

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**Introduction:** The 2-year UK foundation programme (FP) application is based on a scoring system and final year medical students are ranked and allocated to their preferred choice of region to work and train in based on their scores following graduation. Points are allocated to academic components including publications. We aim to evaluate UK medical students' perception of the publication component of the application.

**Methods:** A 15-item online survey based on students' perception of the publication component of the FP application was distributed to final year medical students from all UK medical schools. Opinions were sought via a 5-point Likert scale.

**Results:** A total of 155 final year medical students from 9 medical schools completed the survey (response rate 155/1926, 8.05%). In the survey, 69.7% of students felt under pressure to achieve PubMed-indexed (PMI) publications, 7.1% were not aware that the FP application included points for PMI publications and 72.9% had no publications at the time of application. The main reasons for publishing were for the FP application (81.3% agreed) and to increase competitiveness for future specialty training (85.0% agreed). In contrast, 27.1% agreed that they were motivated to publish due to disseminating knowledge; 22.6% and 25.8% agreed that their medical school did not provide adequate training or opportunities for them to achieve PMI publications, respectively.

**Conclusion:** The majority of students felt under pressure to publish with their primary motivation cited as enhancing their FP application. Overall training and opportunities to publish appear to be inadequate amongst the cohort studied. Medical schools should consider providing academic training and opportunities early to highlight the importance and rationale behind research/audits, minimise pressure and optimise research outputs in preparation for FP application.

**Keywords:** foundation school, foundation programme, medical students, publication pressure, UK postgraduate training

## Introduction

Medical students and trainees are encouraged to participate in research and disseminate findings in the current new era of evidence-based medicine.<sup>1</sup> Academic components are becoming an essential criterion for training job applications. The two-year UK foundation programme (FP) for medical graduates is a work-based training programme which bridges the gap between medical school and core/specialty training.<sup>2,3</sup> Each year final year medical students rank the 20 UK foundation schools (FS) in order of their preferred institution to work and train in following completion of

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medical school training. The allocation to FP is based on a scoring system and up to seven points are allocated to educational achievements including additional degrees (Max. five points) and publications (one point per publication, max. two points).<sup>3</sup> The publication has to be PubMed-indexed (PMI) and the impact factor of the journal and order of authors are not considered.

We previously showed that geographic location was the most important factor for medical students when ranking FSs. This was followed by undergraduate experience and social relationships.<sup>4</sup> The two points allocated for publications may potentially make a significant impact on outcomes of the application and subsequent satisfaction with their working location and social arrangements. It is unclear how applicants perceive the academic component of the FP application and whether this adds additional pressure to their medical school training and examinations. However, it is clear that medical students and trainees do feel under pressured to publish, and around 50% of medical students undertake research/audits for curriculum vitae (CV) building.<sup>5–7</sup> Involvement in research for mainly CV building, career progression and job applications may cause ethical concerns. Especially if number of publications take priority over well-conducted quality research, in the case of ‘salami-slicing’ in order to disseminate multiple articles based on a single study.<sup>8</sup> In addition, for those in an academic career, publishing may be their main drive for maintaining an academic role, ‘Publish or Perish’.<sup>9–11</sup>

Although there is evidence to show that students have a positive attitude towards publishing,<sup>12</sup> the trending term ‘PubMed fever’ has been used to describe the increasing pressure placed on medical students to publish work and the contagious nature of publication-related stress encountered by students.<sup>13,14</sup> It is unclear whether the publication points on the FP application adds to this.

Here, we aim to evaluate medical students’ perception of the publication component of the FP application through an online survey.

## Methods

### Study Design

We performed a descriptive, cross-sectional, survey-based study during the academic year 2018–19. Our population consisted of final year students in UK medical schools.

### Participants

All final year medical students from UK medical schools were invited to complete an online survey.

## Data Collection Method

The methods are reported in accordance with the Checklist for Reporting Results of Internet Surveys (CHERRIES).<sup>15</sup> The instrument used in our study was the 15-item survey designed with the platform ‘SurveyMonkey’ (<http://www.surveymonkey.com>) (Survey Monkey, Portland, OR, USA). As no existing instrument was validated to evaluate our study aims, the questions were developed based on literature review. There were 10 questions comprised 15 items enquiring about number of publications, previous degrees undertaken prior to medical school, awareness of the publication component of the FP application, reasons to publish, opinions regarding the points distribution and medical school support ([Supplementary Figure 1](#)). We first piloted our study in our home institution (University of Sheffield) to test technical functionality of the electronic questionnaire and to ensure face validity and clarity. Opinions were obtained using the 5-point Likert scale (1, strongly agree (SA); 2, agree (A); 3, neither agree or disagree (N); 4, disagree (D); 5, strongly disagree (SD)). A single email with the open survey via a weblink was sent to an academic or institutional contact within each medical school or foundation school.

## Data Analysis

Survey responses were entered into Excel (version 16, Microsoft) for analysis. ‘Strongly agree’ and ‘agree’ were grouped together as ‘agree’, likewise, ‘strongly disagree’ and ‘disagree’ were grouped together as ‘disagree’. Statistical analyses were performed using SPSS (SPSS version 25.0, SPSS Inc., Chicago III). Categorical data were compared using a chi-square test with Yates correction. A *p*-value of <0.05 was considered to be statistically significant.

## Ethics Approval

The study was granted approval by The University of Sheffield Medical School Research Ethics Department (REF 022018). The survey introduction detailed the nature, format, duration of the study and the rationale behind it. Completion of the questionnaire was deemed to be consent to participate in the study. Participants were made aware that data were intended for dissemination through presentation and publication. Ethical issues with regard to data security were addressed by using a secure cloud-based access system. Data were analysed on a University encrypted laptop.

## Results

We received complete responses from 155 (response rate= 155/1926, 8.05%) final year medical students from nine medical schools (Cambridge= 18, Dundee= 17, East Anglia= 17, Liverpool= 3, Manchester= 9, Nottingham= 9, Plymouth= 21, Sheffield= 49, Warwick= 12). Majority of the students, n=113 (72.9%) had no publications when applying for FP training, 25 (16.1%) students had one publication (Figure 1).

A total of 24 (15.5%) students were postgraduates and 83 (53.5%) students undertook an intercalated degree during medical school. The number of students who were not aware of the points allocated for PMI publications for FP application was 11 (7.1%). At least one publication was achieved by 32.7% of those who undertook an undergraduate or intercalated degree and 14.6% of those who do not have any prior degrees ( $p=0.03$ ). A total of 108 (69.7%) students agreed that they felt under pressure to achieve PMI publications during medical school.

## Motivation for Publishing and Opinions Regarding the Distribution of Points and Support from the Medical School

When evaluating students' motivation for obtaining PMI publications, the majority, of students ( $n=126$ , 81.3%) agreed that it was for obtaining additional points for FP application (Table 1).

For the FP application, one point is allocated per PMI publication (max. two points), regardless of authorship position, type of publication or type of journal/impact

factor. When asked about this, 75 (48.4%) students agreed that points should reflect on authorship position and 84 (54.2%) students agreed that points should reflect on the type of publication (Table 1).

A total of 35 (22.6%) students agreed that their medical school provided adequate training for them to achieve PMI publication and 40 (25.8%) students agreed that their medical school provided adequate opportunities for them to achieve PMI publications (Table 1).

## Subgroup Analysis

Subgroup analyses were performed comparing answers given by undergraduates and postgraduates/intercalated students. Both groups of students shared similar answers ( $p>0.05$ ), except that those who intercalated or had a previous undergraduate degree were more in agreement that their motivation to publish was partly related to pursuing an academic career (postgraduates/intercalated, 51.4% vs undergraduates, 33.3%,  $p=0.04$ ).

## Discussion

To the best of our knowledge, this is the first multi-centre survey-based study on medical students' perception of the publication component of the FP application. Pressure of academic publishing for medical students is increasing<sup>16</sup> and we found that nearly three quarters (70.6%) of students felt under pressure to achieve PMI publications during medical school and nearly three quarters (72.9%) had no PMI publications when applying

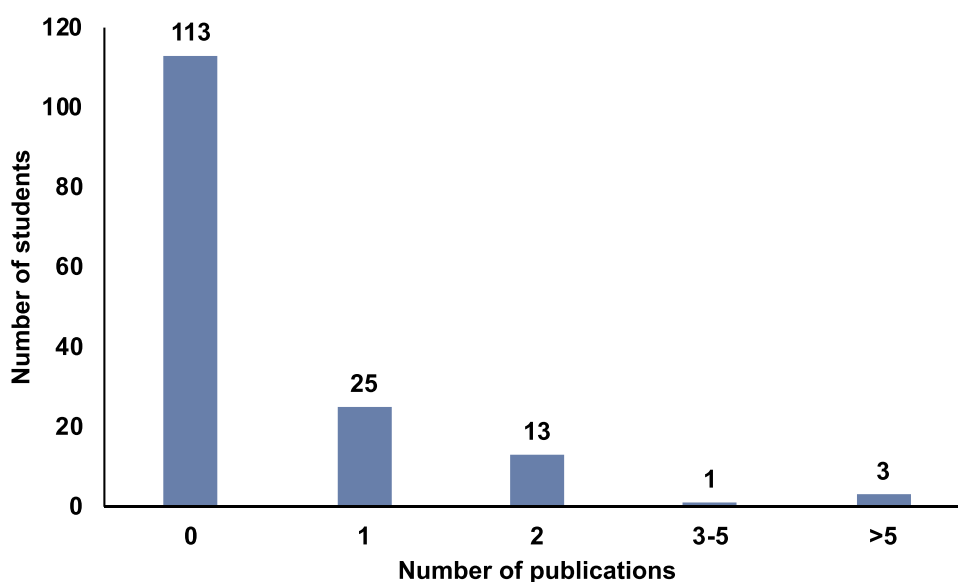


Figure 1 Number of publications prior to foundation programme application.

**Table 1** Motivation Regarding PubMed-Indexed Publications

Survey Components	Strongly Agree (n)	%	Agree (n)	%	Neither Agree or Disagree (n)	%	Disagree (n)	%	Strongly Disagree (n)	%
<b>Motivation to publish</b>										
Obtaining additional points for FP application	77	49.7	49	31.6	13	8.4	13	8.4	3	1.9
Advancing medical knowledge	9	5.8	52	33.5	37	23.9	40	25.8	17	11.0
Pursuing an academic career	30	19.4	41	26.4	29	18.7	40	25.8	15	9.7
Increasing competitiveness for future specialty training	80	51.9	51	33.1	12	7.8	7	4.6	4	2.6
Providing a platform to share knowledge with others	7	4.5	35	22.6	51	32.9	46	29.7	16	10.3
<b>Opinion on the distribution of points</b>										
Points should reflect on the position of authorship	27	17.4	48	31.0	30	19.3	37	23.9	13	8.4
Points should reflect on the type of publication	36	23.2	48	31.0	27	17.4	31	20.0	13	8.4
<b>Opinion on medical support</b>										
Medical school provided adequate training to achieve PMI publications	6	3.9	29	18.7	22	14.2	50	32.2	48	31.0
Medical school provided adequate opportunities to achieve PMI publications	9	5.8	31	20.0	33	21.3	47	30.3	35	22.6

**Abbreviations:** FP, foundation programme; PMI, PubMed-index.

for FP training. This could be associated with time constraint, supervision, training and opportunities available. Around half of the responders undertook an intercalated degree and those who undertook an undergraduate degree or intercalated degree were more likely to have published. Publication pressure, not only occurs amongst students, but occurs amongst most active researchers. In a study involving medical scientists, 72% rated publication pressure as 'too high' and was strongly and significantly associated with scientific misconduct.<sup>17</sup> Similarly, a worldwide survey found that 74% of researchers in the USA and 71% in Australia/Canada/UK agreed that the pressure to publish is high.<sup>18</sup>

The most highly selected motivation for achieving PMI publications was to obtain points for the FP application and to increase competitiveness for future specialty training application (>80%). This is not surprising, as CV-building, 'PubMed fever' have been described as main drivers for participating in research.<sup>6,14</sup> This is going against important objectives of research which include advancing and sharing knowledge, and ultimately, to improve clinical practice and patient care through evidence-base medicine. Unfortunately,

only 27.5% agreed that they were motivated to publish secondary to sharing knowledge with others. The attitude towards this should change, it is important for students to obtain as many points as possible for applications; however, they need to be informed about the importance of audit/research and the necessity of this as part of the General Medical Council (GMC) good practice in research guidance. The GMC state that it is expected that doctors should function as clinicians and scientists by being able to critically appraise medical literature to provide the best possible patient care.<sup>19</sup>

Around half of students were in favour that the points allocation should reflect on author position and type of publication. This makes sense as a third author on a 500-word letter can obtain the same number of points as a first author on a clinical/science original research paper. Therefore, the level of contribution, time and effort used to publish high-quality research should be acknowledged.

Around a quarter of students did not feel that their medical school provided adequate training or opportunities to achieve PMI publications. In addition, 7% were not aware of the points allocation for PMI publications.

Nikkar-Esfahani et al also found that 33% of their student cohort were frustrated by the lack of research opportunities and 63% believed a lack of interest from potential supervisors acted as an obstacle.<sup>6</sup> A recent study analysing the involvement of European surgical trainees in academic activities revealed that 42% felt that they were motivated by their institution to participate in academic activities.<sup>20</sup> It is important during the first year of medical school, students are introduced to the FP application so they can plan early and start acquiring points as they progress. Medical schools and supervisors should introduce the concepts of audit and research early on and encourage students to participate in research activities. Training such as research methodologies, writing skills should be incorporated into the curriculum since our studied students thought that this was lacking. Opportunities to conduct research and disseminate results through presentations and/or publications should be provided, and that can be through student selected modules, electives or hospital attachments. In the UK there are national student research groups that students should be encouraged to join such as the Student Audit and Research in Surgery Collaborative (STARsurg, <https://starsurg.org/>). The group empowers students to participate in collaborative audit and research and fosters academic and research training. In this study, we found that those who intercalated or had a previous undergraduate degree were more likely to have a publication; therefore, increasing awareness/encouragement of intercalation may be useful. Select UK universities run a six-year programme incorporating an intercalated year. Hopefully, by starting early, students will have a few years to slowly build up an academic profile and appreciate the importance and rationale of research, and most importantly to reduce the pressure they experience to achieve PMI publications.

## Limitations

There are several limitations inherent to our study. Our sample size of 155 may not represent the population for which the scale was intended and there is a potential that our results may be subject to the influence of chance factors. Our study had a low response rate (8.05%) which possessed a risk of response bias. This could have been addressed with a second wave of emails or providing paper-based questionnaires. All medical schools were invited to take part in our study; however, only nine out of the 33 UK medical schools participated.

## Conclusion

UK final year medical students publish mainly to acquire points for the FP application. They feel under pressure to publish and medical schools should consider providing sufficient training and opportunities for research activities, and make students aware of the FP application points system early to allow them sufficient time to prepare and obtain points during their training.

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## Author Contributions

All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; agreed on the journal to which the article will be submitted; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

## Disclosure

The authors report no conflicts of interest in this work.

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