

‘Factors influencing future career choices of Queen’s University Belfast Medical students.’

Madden S¹, Martin N¹, Clements JM^{1,2}, Kirk SJ^{1,2}

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ABSTRACT

INTRODUCTION

Decisions made by medical students on future career choice have demonstrated concordance with subsequent postgraduate career path. This study aimed to understand the factors that impact undergraduate career decision making.

METHODS

An anonymous voluntary survey consisting of binominal, Likert and free text responses was distributed to all medical students registered at Queen’s University Belfast (QUB). Data was collected over 6 weeks in April-May 2021. The primary outcome was future career aspirations. The secondary outcomes were the impact of mentorship on career choice, the likelihood of students completing their medical degree and practicing medicine upon graduation. Local ethical approval was obtained.

RESULTS

202 responses were received (response rate 15%). 67% (n = 135) were female. One third of respondents remained undecided about their future career choice. Surgery was both the most popular definite career choice (16.3%) of respondents, but also the specialty marked most often as ‘Least preferred Specialty’ (33%). Factors positively influencing career choice were academic interest and flexibility in working hours. Negative predictors of career choice were lack of interest in the area, perceived workload, and duration of training schemes. 71% (n=144) of respondents reported that a subspecialty mentor would positively influence their career choice and two-thirds of respondents reported that financial factors would influence their career decision. 11% (n= 22) of respondents were unsure or undecided if they would continue medicine as a career upon graduation.

CONCLUSION

Uncertainty over future career intention remains common with surgery the least popular speciality. Mentorship, integrating flexibility in training and enhancing academic interest should be considered by educational stakeholders as mechanisms to generating undergraduate interest in a subspecialty. Furthermore, the reported rate of students

intention to leave their medical degree prior to graduation by this cohort is concerning, warranting further investigation.

Introduction

Medicine offers many potential career paths. However, health services require a supply of medical graduates willing to train in all specialties, in proportion to population and patient need, to provide safe and effective health care to the public¹.

Effective workforce planning ensures that health care needs are met with the ability and aspirations of the individual doctors, thus minimising the financial and personnel costs of attrition from the medical education and training system. Understanding the needs and staffing of the healthcare system guides how medical students are educated, trained, and inspired to enter various career paths. Studies have demonstrated that the decisions made by medical students whilst in university regarding their choice of future career is consistent with their resulting postgraduate career path². Yang et al³ identified that numerous individual, specialty and economic factors play a role in the decision-making process. This systematic review demonstrated that academic interest appears to be the primary determinant, with flexible working, career opportunities, workload and length of training all considered valuable in the decision-making process. Historically, financial remuneration drove career choice⁴, however more recent studies^{5,6,7} have highlighted a trend toward lifestyle factors, with an emphasis placed on quality of life.

Identifying factors that positively and negatively influence a career choice have the potential to influence stakeholders in how they may adapt or develop their perceptions of the specialty to improve future uptake and diversity.

The number of UK medical students is increasing annually^{2,8} and despite a growing body of evidence into career decision making in this undergraduate cohort^{3,9}, no study has achieved an accurate representation to outline the situation in Northern Ireland. Furthermore, it is evident that gaps in recruitment exist in various specialties such as surgery and

1. School of Medicine, Dentistry & Biomedical Sciences, Queen’s University Belfast.

2. Ulster Hospital, Dundonald, Belfast

Correspondence to: Sarah Madden

Email: smadden16@qub.ac.uk

general practice^{10,11}. Therefore an understanding of early influencing factors may identify ways to offset this balance for future workforce planning.

The aim of this study was to identify the factors influencing future career choice amongst medical students at Queen's University Belfast in Northern Ireland.

METHODS

A voluntary 12 question electronic survey (GoogleForms) was distributed to all medical students (n=1377) at a single institution, Queens University Belfast (QUB), an undergraduate medical school in Northern Ireland over a six-week period from April-May 2021. The survey consisted of twelve questions using binomial, Likert, and free text responses. The survey was disseminated alongside a participant information sheet via the electronic QUB portal notice boards and year group social media pages. Reminders were sent out at week 2 and 4 respectively. The survey was voluntary, no identifiable information was collected, thus all completed surveys were anonymous. There were no formal, financial, or other incentives to complete the survey. Ethical approval was granted prospectively by the Faculty of Medicine, Health & Life Sciences Research Ethics Committee at Queen's University Belfast in early April 2021 prior to survey distribution. The survey is attached in Appendix 1.

All students studying medicine or pursuing an intercalated degree as part of their primary medical degree at QUB were included. Students from specialities outside of a medicine degree programme or from other University institutions were excluded.

The primary outcome was future career aspirations by speciality and the positive and negative influencing factors. Secondary outcomes included the impact of mentorship and financial circumstance on career choice, and the reported likelihood of practising medicine after graduation.

Statistical Analysis

Only fully completed survey responses were included in the final analysis. Data was analysed using SPSS® (v.27.0) software (SPSS, Chicago, IL, USA). Univariable comparisons between groups were performed using the student's t or Mann-Whitney U tests for continuous variables, and Chi2 or Fischer exact test for categorical variable. One-way analysis of variance (ANOVA) test was performed for non-parametric continuous data comparing more than two groups (year groups). Logistic regression was conducted to identify factors influencing specialty choice. A p-value of <0.05 was considered statistically significant. Free text responses were analysed using a thematic approach.

Results

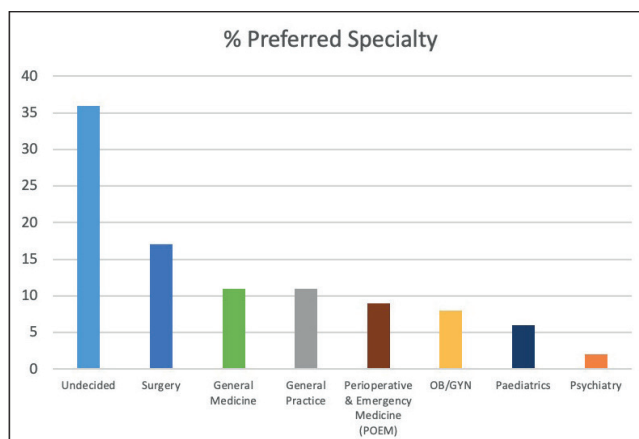
202 complete responses were received (15% response rate). Two-thirds of respondents were female. Respondent demographics are summarised in table 1, which were representative of the general demographics of the medical student population at QUB which are summarised in appendix 2.

Table 1. Respondent Demographics

Gender		
Female	136	67.3%
Male	66	32.7%
Age		
18-22	122	60.4%
23-27	69	34.2%
27+	11	5.5%
Degree status		
Undergraduate	148	73.3%
Postgraduate	54	26.7%
Year Group		
1	20	9.90%
2	30	14.85%
3	95	47.03%
4	45	22.28%
5	12	5.94%

Figure 1 summarises respondents subspecialty career choice. 34% of respondents remained undecided with regards to their future career choice and students appear to be more certain of their career choice with increasing seniority. Surgery (16.3%), general medicine (10.4%), general practice (10.4%) was the most popular preferred career choice selected by respondents. There was a statistically significant association between preferred career specialty and gender (p 0.018), year group (p 0.022), age (p 0.004), and degree status (p 0.041).

Figure 1. Respondents career choice



Individual determinants of career choice are summarised in Table 2. General academic interest was considered, by far, to be the largest individual determinant of career choice with almost two-thirds of respondents selecting it as the most important factor when considering a career in a subspecialty. A flexible work schedule and a positive clinical experience were also recognised as important factors.

Table 2. Summary of Individual determinants of career choice

Individual Determinants of career choice	NO.	%
General academic interest	127	62.8
Having a flexible work schedule	37	18.3
Having a positive experience on clinical attachment	21	10.3
Opportunity for career progression	9	4.5
Advice from others (family, friends, other medical professionals)	6	3.0
Having a clinical mentor in this speciality	2	1.0



Female students placed greater importance on 'having a flexible work schedule' as a contributing factor to career choice compared to their male counterparts (21% vs 12%) (p 0.044). In addition, postgraduate students selected 'having a flexible work schedule' as an important factor when making future career decisions compared to their undergraduate counterparts (37% vs 15.5%) (p 0.04).

Specialty related factors are summarised in Table 3. Competencies and skills, patient-centred orientation and the workload associated with a subspecialty were determined as the most important factors that this cohort would consider when making a career decision.

Table 3. Summary of specialty specific determinants of career choice

Specialty specific factors	NO.	%
Competencies and skills required	59	29.2
Patient centred orientation of specialty	53	26.2
Workload associated with specialty	30	14.9
Undecided	20	9.9
Length of training scheme	16	7.9
Potential for career progression	15	7.4
Earning potential	5	2.5
Prestige of specialty	4	1.9

Figure 2 summarises respondents least preferred subspecialty. Respondents were least likely to pursue a career in Surgery (32%) or Psychiatry (31%). There were no statistically significant associations between least preferred specialty and gender, year group, age, or degree status. Table 4 summarises factors that dissuaded respondents from selecting a career in a certain subspecialty. Over two-thirds of respondents stated that a lack of academic interest was the greatest deterrent for selecting a subspecialty. The perceived workload of a specialty, a lengthy training scheme and a negative clinical experience were also considered negative factors.

Figure 2. Respondents least favoured subspecialty

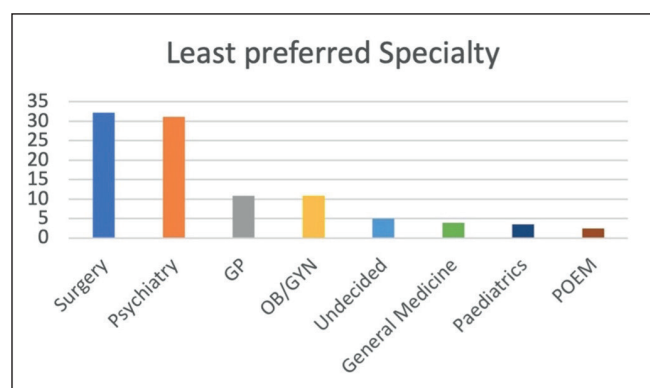


Table 4. Summary of factors which negatively influence subspecialty choice

Negative factors influencing career choice	No.	%
Lack of academic interest	137	67.8
Perceived workload	17	8.4
Lengthy training scheme	12	5.9
Negative clinical experience	12	5.9
Lack of control over working hours	9	4.4
Not applicable	7	3.4
Limited opportunities for career progression	3	1.4
Advice from others	2	1
Lack of mentorship	2	1
Earning potential	1	0.5

71% of respondents commented that a having a subspecialty mentor would make them more likely to consider a career in that area. There was no statistical significance for the variables age, gender, previous degree status and year group. A thematic analysis of the free text responses for this question found that career guidance, support, insight, and information into the subspecialty were the most common reasons for respondents' decisions.

62% of respondents stated that financial circumstances, including student debt and financial dependence, would not influence their career choice. However, 53.7% of post-graduates considered financial circumstances as an important factor when deciding a future career (p 0.004, 95% CI 0.212, 0.759).

11% of respondents were unsure or undecided if they would continue medicine as a career upon graduation (unlikely, very unlikely, undecided, unsure about completing their degree). Of the cohort that stated they were unlikely or unsure about furthering their medical career, approximately seventy-five percent were in clinical years 3 – 5 and two-thirds had previous degrees. There were no statistically significant associations between the likelihood of practicing medicine and gender, year group or degree status respectively. However, there was a significant association between the likelihood of practicing medicine and age group (p 0.001). Forty-five percent of students in the 27+ age group stated that they were undecided or unlikely to pursue medicine as a career compared to 9.8% and 7.2% of students in the 18-23 years and 23-27 years respectively.

A thematic analysis of free text responses from this question revealed the following as contributing factors: the pressures of making mistakes as a junior doctor, other interests, a perceived poor work-life balance, the length of postgraduate training and a perceived poor working environment. Free text responses are attached in Appendix 3.

Discussion

This study is the first to quantify the future ambitions of QUB medical students on a national scale in Northern Ireland. Over one-third of medical students remain undecided about their future career preference. Academic interest remains the



most important individual factor for selecting a subspecialty and is comparable to studies in other geographical regions³.

With the advent of the new C-25 medical student curriculum at QUB, this study highlights the importance of fostering academic interest in subspecialties and ensuring that strategies are in place to promote positive and immersive clinical experiences with patients focusing on practical skill acquisition. Increasing duration of clinical exposure to subspecialties and at an earlier stage in medical education, as well as mentorship, where there is a clear appetite, may be of value. The use of digital technology such as simulation-based learning and virtual reality (VR) teaching may also act as useful adjuncts. Both are increasingly utilised in medical education and are shown to provide an immersive and positive experience for medical students¹². VR could be utilised as an adjunct to clinical attachments to allow students to experience a subspecialty in more depth, including competencies and skills, and thus sparking a greater academic interest in that area.

Surgery was identified as a polarising subspecialty in this study with 16% of respondents selecting it as their preferred specialty while almost one-third of this cohort did not wish to pursue a career in surgery. This further highlights the uncertainty regarding career choice at an undergraduate level. Of the 34 respondents who wish to pursue Surgery, 25 respondents (74%) selected general academic interest as the strongest influential factor for selecting a career in this specialty. Factors that appear to negatively influence a career in surgery amongst our cohort were a lack of academic interest, a lengthy training scheme and the perceived workload of the specialty. This correlates with other studies on this topic^{10,13}. The factors dissuading foundation doctors from applying to core surgical training were the working hours, the impact on work/life balance and the working environment. The findings of this study are comparable to other studies of a junior doctor cohort, suggesting that the decision not to choose a surgical career is consistent with the decisions of medical school and not influenced by the early practice of clinical medicine. Interestingly, more senior medical students in our survey were less likely to select a surgical career, suggesting that these decisions may be influenced by clinical experience, advice from senior peers or interactions with clinicians. Other studies have determined that lifestyle factors had the greatest negative influence when pursuing a surgical career with up to two-thirds of respondents across several studies selecting lifestyle as the most common reason for avoiding a surgical career¹³⁻¹⁵. In our study, 23% of respondents who would not pursue surgery as a career, selected 'workload' and 'lack of control over working hours' as lifestyle factors that would negatively influence their career choice. It is also important to note that 'having a flexible work schedule' was considered the second most important positive factor for selecting a subspecialty in this cohort, especially amongst female students and those with a previous degree. This study serves to further highlight

that although academic interest plays a significant role in career choice, the current population of medical students' favour 'work-life balance' over other factors when selecting their subspecialty.

Furthermore, of those respondents who would not choose a surgical career, approximately three-quarters were female, highlighting that gender remains a barrier for selecting a career in Surgery. Interestingly, the number of female medical students in the UK is steadily increasing. In 2020, 64% of students accepted into medicine and dentistry courses in the UK were female¹⁶. The reasons for female students and medical students in general not choosing surgery is most likely multifactorial. However, the perceived workload of surgery as a specialty and lack of work-lifestyle balance prevails as one of the main deterrents to choosing surgery as a career. This apparent lack of interest amongst medical students in our study to pursue a career in surgery correlates to previous similar studies in the UK and Ireland^{11,14} and could have implications for subsequent workforce planning. Compounding this, surgical applications globally are declining, and a higher proportion of core surgical trainees are not completing their training with an attrition rate of up to 25%¹⁵. Furthermore, due a shortfall in general practitioners in the UK and the demand in primary care expected to rise in the coming years¹¹, there is a greater drive to recruit medical students into careers in primary care¹⁴. In 2016, the House of Commons, in their report on primary care in the UK, stated that medical schools have a 'responsibility to prepare half of all graduates for careers in general practice'¹⁷. The By Choice, not by Chance report sponsored by Health Education England and the Medical Schools Council also made recommendations for medical schools to boost recruitment in general recruitment at an undergraduate level¹⁸. This Governmental agenda may "divert" students from hospital specialities (and specifically surgical) training in the future towards the specialty of General Practice.

One in ten medical students were either uncertain or unlikely to continue their degree or their medical career after graduation. Due to a relatively low response rate, it is difficult to ascertain if this rate (4%) is representative of the entire medical student cohort at QUB and requires further investigation. Although this figure does not represent the attrition rate at this university, it provides a narrative on future intent of students in years to come and requires further investigation. Numerous studies¹⁹⁻²⁵ have addressed attrition rates amongst medical students and the results of these studies vary from 3% to 26%. It is difficult to compare the attrition rates across the studies as they have been conducted across different medical schools and across vastly different timelines, with the last UK based study conducted almost twenty years ago in Nottingham, with an attrition rate of 6%²¹. Naturally, it would be unrealistic to expect every medical student to complete their degree or to pursue a career in medicine after graduation. Equally, it possible that this uncertainty about completing the medical degree



or pursuing a medical career is a result of poor timing due to the COVID-19 pandemic which has posed many issues for medical education and the medical workforce. However, further thematic analysis of these responses provides a stark warning for the future of the medical workforce in the UK. Alarmingly, three-quarters of this uncertain cohort were in clinical years, whilst two-thirds of respondents were post-graduates pursuing medicine as a second degree. It is evident that students already feel overwhelmed by the prospect of poor working conditions and the pressures of making a mistake as a junior doctor when they graduate. This sentiment is mirrored among the medical workforces. In a recent BMA tracker survey (February 2021), of the doctors surveyed, 21% of were 'more likely' to leave the NHS for another career citing workload, stress, and burnout as reasons for leaving their career²⁶. Presently, it costs the government approximately £230,000 to educate a UK or EU national through medical school²⁷. Paradoxically, in recent years, there has also been an initiative to increase the number of medical student places in the UK to meet the demand of a rapidly ageing population. However, this may be a fruitless endeavour if almost one in ten medical students are unsure if they will ever practice as a doctor while almost one in five doctors are considering a career change. Perhaps some of these resources would be better served to retain medical students and reduce the attrition rate amongst the medical workforce.

Limitations

We recognise the limitations of this qualitative study. Firstly, the method of survey distribution may have impacted the response rate. The survey was only permitted to be advertised on social media channels such as year group Facebook pages and online noticeboards which may have precluded anyone who is not active on social media from participating in this study. In addition, this study did not seek data on those intercalating medical students. This subset of students did not have an identifiable online Facebook group or noticeboard for survey distribution. However, these students may have completed the survey via other means including their previous year group Facebook page but were not isolated in our analysis. Academic interest in a subspecialty and/or to improve future employment opportunities²⁸ are primary determinants of decision to intercalate which are reflected in our findings. The timing of survey may have also limited our response rate as it was disseminated four weeks before end of semester exams. In addition, the survey response varied among year groups with lower responses from years 1 and 5 with higher uptake from years 2, 3 and 4. Thus, the year 1 and year 5 groups may be considered underrepresented in this study. Notwithstanding these limitations, and a response rate of 15%, the demographics of the participants of this study are comparable to the demographics of the student cohort at this institution in terms of gender, age, and degree status.

Conclusion

Our study has highlighted indecision in this cohort. It has

identified common factors that influence undergraduate medical student career choice which may provide educators the opportunity to craft curriculae to entice and inspire students into certain specialties. It has highlighted that gender remains a barrier for some subspecialties such as surgery. Regarding continuing a medical degree or practicing medicine upon graduation, this study has identified that the rate of uncertainty amongst medical students at this institution is significant. Attrition rates amongst medical students and the likelihood of continuing a medical career in the UK is not widely discussed in the literature and warrants further review by key stakeholders.

Conflict of Interest

The authors declare that they have no conflict of interest.

REFERENCES

1. Cleland JA, Johnston PW, Anthony M, Khan N, Scott NW. A survey of factors influencing career preference in new-entrant and exiting medical students from four UK medical schools. *BMC Med Educ.* 2014 **Dec**;14(1):15. doi: 10.1186/1472-6920-14-151.
2. Carter S. Most junior doctors are confident of achieving career goals, finds BMA study. *BMJ Careers.* 2012; **345**: e6142. doi: <https://doi.org/10.1136/bmj.e6142>
3. Yang Y, Li J, Wu X, Wang J, Li W, Zhu YI, *et al.* Factors influencing subspecialty choice among medical students: a systematic review and meta-analysis. *BMJ Open.* 2019;**9**(3):e022097. DOI:10.1136/bmjopen-2018-022097
4. Pisaniello MS, Asahina AT, Bacchi S, Wagner M, Perry SW, Wong ML, *et al.* Effect of medical student debt on mental health, academic performance and specialty choice: a systematic review. *BMJ Open.* 2019;**9**(7): e029980. DOI: 10.1136/bmjopen-2019-029980
5. Patel RK, Sayers AE, Akbar MJ, Hunter IA. A survey to determine the potential impact of foundation year career aims on surgical specialty training. *Ann Med Surg (Lond).* 2014;**3**(1):13-7.
6. Jaunoo SS, King TR, Baker RF, Adams HL. A national survey of reasons why students and junior doctors choose not to pursue a career in surgery. [Internet] *Bull Roy Coll Surg Eng.* 2014;96(6):192-4. (cited 2023 Jan 27). Available from: <https://publishing.rcseng.ac.uk/doi/10.1308/rcsbull.2014.96.6.192>
7. Mohammed TA, Abdulrahman AA, Saud KA, Alaa NT. Specialty preferences and factors affecting future career choice among medical graduates in Saudi. *J Fam Med Prim Care.* 2020;**9**(3):1459. DOI: 10.4103/jfmpc.jfmpc_1199_19
8. General Medical Council. The state of medical education and practice in the UK. 2016. London: General Medical Council; 2020.
9. Lambert TW, Smith F, Goldacre MJ. Career specialty choices of UK medical graduates of 2015 compared with earlier cohorts: questionnaire surveys. *Postgrad Med J.* 2018;**94**(1110):191-7
10. Bartlett J. Addressing the recruitment shortfall in surgery - How do we inspire the next generation? *Ann Med Surg (Lond).* 2017; **25**: 30-2.
11. Owen K, Hopkins T, Shortland T, Dale J. GP retention in the UK: a worsening crisis. Findings from a cross-sectional survey. *BMJ Open.* 2019;**9**(2):e026048. doi: 10.1136/bmjopen-2018-026048
12. Pottle J. Virtual reality and the transformation of medical education. *Future Healthc J.* 2019;**6**(3):181-5.
13. Jaunoo SS, King TR, Baker RF, Adams HL. A national survey of reasons why students and junior doctors choose not to pursue a career in surgery. [Internet] *Bull Roy Coll Surg Eng.* 2014;96(6):192-4. (cited 2023 Jan



- 27). Available from: <https://publishing.rcseng.ac.uk/doi/10.1308/rcsbull.2014.96.6.192>
14. Boyle E, Healy D, Hill AD, O'Connell PR, Kerin M, McHugh S, *et al.* Career choices of today's medical students: where does surgery rank? *Ir J Med Sci.* 2013;**182(3)**:337-43.
 15. Green R, Steven R, Haddow K. Declining applications to surgical specialist training: an ENT perspective on when we should start to worry. *Bull Roy Coll Surg Eng.* 2017 Apr;**99(4)**:142-4.
 16. Royal College of Surgeons of England. Women in surgery. [Internet]. London: Roy Coll Surg Eng; 2022. (cited 2023 Jan 27). Available from: <https://www.rcseng.ac.uk/careers-in-surgery/women-in-surgery/statistics/>
 17. UK Parliament. House of Commons Health Committee. Primary care: fourth report of session 2015–16. London: House of Commons; 2018. (cited 2023 Jan 27). Available from: https://publications.parliament.uk/pa/cm201516/cmselect/cmhealth/408/40804.htm#_idTextAnchor005
 18. Medical Schools Council, Health Education England. By Choice – Not by Chance. London: MSC Medical Schools Council; 2016. (cited 2023 Jan 27). Available from: <https://www.medschools.ac.uk/media/2881/by-choice-not-by-chance.pdf>
 19. Simpson KH, Budd K. Medical student attrition: a 10-year survey in one medical school. *Med Educ.* 1996;**30(3)**:172-8.
 20. Arulampalam W, Naylor RA, Smith JP. Dropping out of medical school in the UK: explaining the changes over ten years. *Med Educ.* 2007;**41(4)**:385-94.
 21. Yates J. When did they leave, and why? A retrospective case study of attrition on the Nottingham undergraduate medical course. *BMC Med Educ.* 2012;**12: 43**. DOI <https://doi.org/10.1186/1472-6920-12-43>
 22. Maher BM, Hynes H, Sweeney C, Khashan AS, O'Rourke M, Doran K, *et al.* Medical school attrition-beyond the statistics a ten year retrospective study. *BMC Med Educ.* 2013;**13: 13**. DOI: 10.1186/1472-6920-13-13
 23. AAMC Association of American Medical Colleges. Data snapshot. Graduation rates and attrition rates of U.S. medical students. Washington, DC: AAMC Association of American Medical Colleges; 2018. (cited 2023 Jan 27). Available from: <https://www.aamc.org/system/files/reports/1/graduationratesandattritionratesofu.s.medicalstudents.pdf>
 24. Anand A. Attrition Rate and Reasons for Attrition in Medicals Schools Worldwide-An Analysis. *Texila Int J Basic Med Sci.* 2018;**1(3)**:1-6. (cited 2023 Jan 27). Available from: <https://www.texilajournal.com/basic-medical-sciences/article/1307-attrition-rate-and>
 25. Yadav H, Yusoff N, Tan KL. Attrition of Medical Students in International Medical University - 2002 to 2007. *South-East Asian J Med Educ.* 2012;**6(1)**:42-4
 26. BMA Media Centre, Press Release. Overworked doctors must be allowed to rest and recover so we can keep patients safe, BMA warns. [Internet]. London: British Medical Journal; 2021. (cited 2023 Jan 27). Available from: <https://www.bma.org.uk/bma-media-centre/overworked-doctors-must-be-allowed-to-rest-and-recover-so-we-can-keep-patients-safe-bma-warns>
 27. Great Britain. Department of Health. Expansion of Undergraduate Medical Education: a consultation on how to maximise the benefits from the increases in medical student numbers. London: UK Government; 2017. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/600835/Medical_expansion_rev_A.pdf
 28. Meguid EA, Allen WE. An analysis of medical students' attitude and motivation in pursuing an intercalated MSc in clinical anatomy. *Med Sci Educ.* 2019;**29(2)**:419-30.



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