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ORIGINAL ARTICLE

Impact of Increased Patient-Clinician Virtual Visits During the COVID-19 Pandemic on Medical Student Enthusiasm for Future General Practice Careers

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ABSTRACT

Background: The COVID-19 pandemic restricted the availability of face-to-face primary care visits. This rapidly increased the proportion of primary care patient-clinician visits conducted virtually and asynchronously (remote consultations via video, telephone, and web-based text/email), altering the educational environment for medical students. Our study explored the impact of the increased proportion of primary care visits conducted virtually and asynchronously, on medical students' self-reported interest in pursuing a career in general (family) practice.

Methods: We conducted a cross-sectional survey study of medical students at six universities within England and Wales to explore the impact of the increased proportion of primary care visits conducted virtually and asynchronously on medical students' interest in pursuing a career in general practice.

Results: One hundred fifty-four medical students were recruited between December 2020 and May 2021; 79 (51%) of the participants reported being less interested in pursuing a career in general practice as a result of the increased proportion of virtual and asynchronous primary care visits during the COVID-19 pandemic. This increased to 104 (68%) of the participants reporting being less interested should primary care visits continue to be delivered virtually or asynchronously by default. Analysis of open-ended survey questions identified a poorer educational experience, concerns regarding the impact on patient care, an isolated working environment and technological challenges as key negative themes.

Conclusions: Sociable, supportive working and learning environments and offering equitable care are important motivators for the future workforce. There is a need to develop robust training and assessment in patient-clinician virtual visits and asynchronous communication and to integrate this into curricula.

INTRODUCTION

Patient-clinician virtual visits (telephone, video), asynchronous communication (web-based text/email), and telephone triage tools have been increasingly used in primary care over the past decade, though before the COVID-19 pandemic uptake of these remote consultations in the United Kingdom was relatively low.[1,2] These have been used alongside more traditional face-to-face and home visits and can provide additional flexibility and accessibility for patients.[3,4] However, patient experiences regarding these have been mixed and concerns have been raised regarding the inequity in care provided to certain patient groups.[5,6] The need to train general practitioner (GP) trainees (doctors in a several-year training program to become registered GPs) in these newer types of consultations has been identified,[7] but the impact on medical students has not yet been explored and telemedicine was not included in all medical school curricula prior to the COVID-19 pandemic.[8,9]

The COVID-19 pandemic caused restriction of face-to-face contact in order to minimize the risk of viral transmission. This accelerated the use of virtual visits, asynchronous communication, and triage in primary care (to a much greater degree than secondary care who maintained a greater proportion of their in-patient services). This not only significantly reduced face-to-face doctor-patient interactions, but also those between patients and medical students.[10,11] In the UK during the first year of the pandemic the majority of these visits were by telephone due to a lack of infrastructure. During

this period, the number of face-to-face appointments was minimal, limited to those deemed essential following virtual or asynchronous triage and many GPs worked by telephone from their homes. Student-patient virtual visits have helped bridge the gap in clinical primary care education during the pandemic,[12] as well as providing opportunities for developing verbal communication skills and history-taking. However, students have expressed concerns about lack of opportunity to practice clinical skills and physical examination.[10] It is known that medical student general (family) practice placement experiences influence student choice towards a career in primary care,[13,14] with length and quality of clinical teaching directly impacting student ambition to pursue a career in general practice.[15,16] This led to concerns that recent changes to students' primary care placements might impact their interest in general practice careers. The subsequent announcement by the former UK Secretary of State for Health and Social Care,[17] that virtual visits or asynchronous communication should be the default moving forward caused concern that there may be substantive policy change, and were challenged by general practice leaders,[18,19] and the UK media.[20] This may have further impacted student career intentions in the UK.

There have been longstanding problems in the UK with general practice specialty training recruitment. To address these issues, the Department of Health set a target of 50% of postqualification training posts to be in general practice by 2016, to support an expansion in the GP workforce, and to meet increasing service demands.[21] Though in the UK recruitment has improved in recent years (with general practice accounting for 47% of all available specialty training posts), in 2021 general practice was one of only three specialties not initially filling all training posts.[22] Additionally, among newly-qualified (foundation) doctors who were directly appointed to speciality training programs, the proportion of those who were appointed to general practice specialty training has decreased in recent years.[23] It is therefore imperative to understand the impact of the changes to working practice on medical students' career intentions and the reasons behind changes in their career plans. We conducted a cross-sectional survey study to explore how the increase in virtual primary care visits and asynchronous communication has impacted medical students' interest in pursuing a career in general practice and main factors contributing toward this.

METHODS

Aim, Study Design, and Setting

A cross-sectional survey study was carried out to explore factors influencing medical students' interest in pursuing a career in general practice. Medical students studying at six universities across England and Wales were invited to participate. An online questionnaire was used to quantify medical students' exposure to patient-clinician virtual visits and asynchronous communication (remote consultations) and to survey their perspectives of the positive and negative factors influencing their intent in pursuing a career in general practice. The questionnaire focused on how students' experiences of patient-clinician virtual visits and asynchronous communication during the COVID-19 pandemic may have impacted their enthusiasm for general practice careers. Ethical approval was granted by the University of Warwick Biomedical and Science Research Ethics Committee (BSREC). Permission to recruit medical students into the study was received from each of the students' respective institutions.

Recruitment

Recruitment took place between December 2020 and May 2021. A convenience sampling approach was taken.[24] Standardized e-poster advertisements and participant information sheets (reviewed by BSREC) were circulated by student collaborators at their respective institutions through institution specific medical society social media groups. Due to the nature of recruitment, it was not possible to monitor the number of students who were invited (the number of students who saw the advertisements) or the response rate. All participants provided prior informed consent to participate in the study and voluntarily completed the online questionnaire hosted on the Qualtrics platform (Qualtrics, LLC, Provo, UT).

Participants

Participants were current medical students at the time of recruitment, studying at one of six medical schools in England and Wales. It was not feasible to target recruitment toward students who had completed a primary care placement or a clinical placement, therefore the questionnaire captured this. A total of 154 participants were recruited to the study. The eligible population were all medical students studying at six participating institutions, namely Warwick Medical School, Swansea University Medical School, GKT School of Medical Education, Birmingham Medical School, Newcastle University School of Medicine, and Keele University School of Medicine.

Questionnaire

As no previously-validated questionnaire exists, our questionnaire was designed to test our hypotheses and was piloted on several medical students prior to the study launch.

Integral to the design was brevity, to reduce the impact of participant fatigue and encourage completion of the optional qualitative questions.

The questionnaire consisted of 14 questions; the first questions were included to capture information about student demographics, which it was hypothesised might be associated with prior interest in general practice careers. Remaining questions were included to survey participants' opinions regarding prior interest in pursuing a career in general practice and changes to this interest during the COVID-19 pandemic. No sensitive data regarding participants were collected. A mixture of open and closed questions with Likert scales were included to obtain both qualitative and quantitative information.

Data were collected regarding educational background, student age, and current institution, as older and graduate-entry medical students have historically been more likely to

choose careers in general practice possibly due to the shorter length of training.[25] Student ages and educational background were collected as grouped data to preserve the anonymity of participants. Further questions gathered information on student interest in general practice prior to commencing medical school, and their exposure to patient-clinician virtual visits and asynchronous communication during their time at medical school. The remainder of the questions were open ended and explored whether the increase in patient-clinician virtual visits and asynchronous communication during the COVID-19 pandemic and the drive to maintain this in the future had impacted students' interest in pursuing a career in general practice.

Statistical Analysis

All participants who completed and submitted the questionnaire were included in the analyses. Qualitative data were categorized into themes independently in a thematic analysis using the 6-step model of Braun and Clarke and an inductive approach[26]; this was reviewed by the senior authors. Likert scales were merged to form composite groups (the two positive and two negative groups being combined) to allow most appropriate statistical analysis considering the sample size. Quantitative data were analyzed using Fisher's Exact Test of Independence. Stata version 17.0 software (Stata Corp, College Station, TX) was used for quantitative data analysis.

RESULTS

Table 1 shows the study demographics. Prior interest in pursuing a career in general practice was unaffected by age, educational background or type of course studied. Change in interest in pursuing a career in general practice was unaffected by age, educational background, prior interest in general practice, whether students had commenced primary care teaching, exposure to patient-clinician virtual visits and asynchronous communication (remote consultations), or formal teaching on patient-clinician virtual visits and asynchronous communication.

Quantitative Analyses

Table 2 shows the proportion of participants who reported a change in their interest in pursuing a career in general practice because of (1) the increased proportion of patient-clinician primary care visits carried out virtually and asynchronously, and (2) the implied government policy direction that future primary care visits should be delivered virtually or asynchronously by default, stratified by whether participants were not interested or neutral/interested in a career in general practice prior to starting medical school. Those participants who had not been interested in a career in general practice prior to starting their degree were less likely to report a change in their interest because of the increased proportion of virtual and asynchronous primary care visits during the COVID-19 pandemic. This difference was statistically significant at a 5% single-sided level of significance (OR 1.88, P=.04). There was also a trend for participants who had not been interested in a career in general practice prior to starting their degree to be less likely to report a change in their interest because of the statement on implied future government policy (OR 1.72, P=.09).

Figure 1 shows the distribution of Likert scale responses to the question,

> The coronavirus pandemic has resulted in an increased number of primary care (GP)

TABLE 1. Study Participant Demographics, n=154

Demographic	n (%)
Age (Years)	
18–21	23 (14.9)
22–25	84 (54.5)
26–29	28 (18.2)
30+	19 (12.3)
Highest Completed Level of Education	
Degree level	109 (70.8)
A Levels or equivalent	45 (29.2)
Type of Course	
Graduate entry course (accelerated)	99 (64.3)
Undergraduate entry course	55 (35.7)
Prior Interest in a Career in General Practice	
Not interested	61 (39.6)
Neutral	27 (17.5)
Interested	66 (42.9)
Experienced Primary Care-Based Teaching	
Yes	128 (83.1)
No	26 (16.9)
Any Formal Training on Remote Consultations	
Yes	89 (57.8)
No	65 (42.2)
Experience of Simulated Remote Consultations	
Yes	85 (55.2)
No	69 (44.8)
Proportion of Primary Care Remote Consultations on Clinical Placement[a]	(n = 100)
<50%	13 (17.6)
50%	11 (11.8)
>50%	76 (70.6)

[a]Since March 2020. Not all students had had a primary care clinical placement since the start of the pandemic.

TABLE 2. Change of Interest Amongst UK Medical Students in Pursuing a Career in General Practice According to Interest in General Practice Prior to Starting Medical School, n=154

	Not Previously Interested in Pursuing a Career in General Practice, n=61 (39.6)	Previously Neutral or Interested in Pursuing a Career in General Practice, n=93 (60.4)	OR	*P* Value
Change of interest in pursuing a career in general practice due to increased proportion of remote consultations	n (%)	n (%)		
Yes	30 (49.2)	60 (64.5)	1.88	.043[a]
No	31 (50.8)	33 (35.5)		
Change of interest in pursuing a career in general practice due to the position of the health secretary that future primary care consultations should be delivered remotely by default				
Yes	39 (63.9)	70 (75.3)	1.72	.092
No	22 (36.1)	23 (24.7)		

[a] 1-sided Fisher's exact test, significant at an α of 0.05.

> consultations currently being delivered remotely. Has the recent increase in the proportion of GP consultations which are delivered remotely affected your interest in pursuing a career in general practice?

Seventy-nine (51%) of the 154 participants reported being less interested in a career in general practice because of the increased proportion of patient-clinician virtual visits and asynchronous communication during the COVID-19 pandemic compared with 12 (8%) who were more interested. The remainder reported no impact.

Figure 2 shows the distribution of Likert scale responses to the question,

> The health secretary has suggested that future primary care (GP) consultations should be delivered remotely by default. Has this position affected your interest in pursuing a career in general practice?

One hundred four (68%) of the 154 participants reported being less interested in a career in general practice due to statements by the former Secretary of State for Health and Social Care that future primary care consultations should be delivered virtually or asynchronously by default.

Qualitative Thematic Analysis

Of the 154 participants, 137 (89%) submitted free-text responses. Analysis of this qualitative data identified five themes related to change in enthusiasm for future general practice careers during the COVID-19 pandemic (Table 3).

Primary Care as a Learning Environment

One theme was barriers to learning during virtual visits and asynchronous communication. Students commented that reduced opportunities to actively participate (versus in-person consulting) influenced their interest in pursuing a career in general practice. These made placements less enjoyable and led to concerns about undertaking future training in general practice:

> Less face-to-face contact with patients therefore unable to practice effective communication skills that we have been trained for in medical school.

Furthermore, reduced opportunities to practice clinical and communication skills and reduced in-person access to patients all influenced their interest in pursuing future general practice training:

> Inability to physically see patients may affect training in the future which is a concern. I don't feel it's as good as a learning experience.

Flexible Working

The only predominantly positive theme related to flexibility of working, with a small number of participants identifying this as a positive outcome of virtual visits and asynchronous communication:

> The option to work remotely as a GP would be very attractive in terms of balancing my other life commitments—in particular the thought of wanting a family in future.

Patient Impact

Concern was raised from students regarding the reduction in personalized and holistic care, and its potentially detrimental effect on patients:

FIGURE 1. **Responses to Likert Scale Question, "Has the recent increase in the proportion of GP consultations which are delivered remotely affected your interest in pursuing a career in general practice?"**

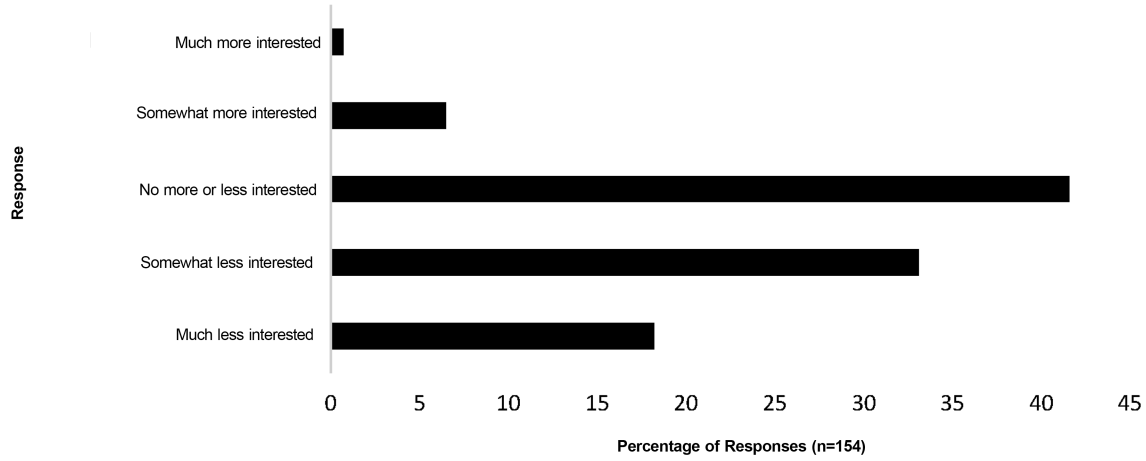

FIGURE 2. **Responses to Likert Scale Question, "The health secretary has suggested that future primary care (GP) consultations should be delivered remotely by default. Has this position affected your interest in pursuing a career in general practice?"**

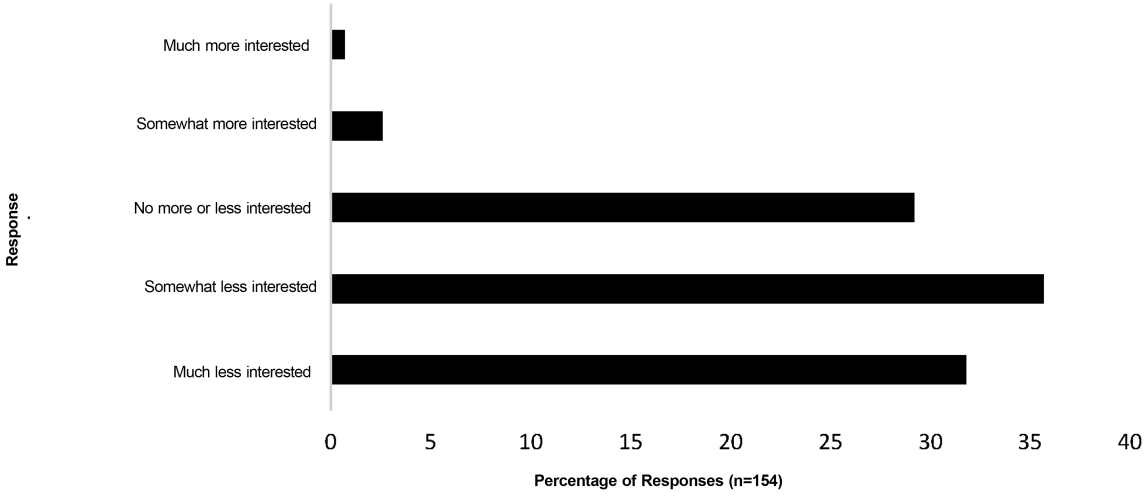

TABLE 3. **Summary of Main Themes Identified for Increased (Positive), Neutral, or Decreased (Negative) Interest in Pursuing a Career in General Practice**

Positive Themes	Neutral Themes	Negative Themes
Potential for increased flexibility of working with remote consultations	Career decision not influenced by remote consultations	Barriers to learning experienced as a result of remote consultations
	Belief that the increase in the proportion of remote consultations is temporary	Concerns about the impact of remote consultations on patient experience/patient safety
	Unwavering in interest or lack of interest in general practice	Concerns about the impact of remote consultations on working environment
		Concerns about technology barriers

> We keep talking about holistic care and seeing the patient as a person but without gestures and body language and proper tone and eye contact, I think this is far more difficult and I wouldn't want to spend my career pursuing something I don't really believe in.

Patient safety concerns were also highlighted:

> Patients in dangerous situations may not be honest over the phone if someone else is in the room with them.

Students also questioned the ability to adequately assess and manage patients virtually and asynchronously:

> I imagine I wouldn't always feel confident to diagnose/prescribe without seeing the patient face-to-face—examination is really important.

This was especially a concern for patients who had conditions where visually observed signs are more important in the diagnostic process:

> More difficult to diagnose... particularly for things like dermatological conditions.

The impact of the loss of nonverbal cues, especially when communicating with patients less adept at verbally communicating their complaint or where there is a language barrier, was also highlighted:

> It is much harder to ascertain what the problem is when you cannot see non-verbal cues and actions/pointing.

> You get a lot from their body language and facial expressions which you can't get from a phone call.

Additionally, students noted the loss of visual cues had implications for opportunistically identifying important signs:

> Things are easier to miss not in person.

Contrarily, a positive aspect of increased flexibility and accessibility for patients was identified.

Working Environment

Many participants identified that their interest in general practice as a career was related to the high levels of face-to-face patient contact and the ability to work in supportive teams:

> I went into medicine because it isn't usually a job done remotely.../over the phone. I like the face-to-face contact, I like the physical requirements such as patient examinations etc.

This was contrasted unfavorably with the hospital working environment, which students felt had not become as isolating during the COVID-19 pandemic:

> Placements in hospital offering more supportive environment from colleagues.

Students perceived some positive aspects to the working environment relating to workload:

> More routine issues like medication reviews and referrals can be completed quickly.

Technology

Small number of participants identified challenges with the increased use of technology and functionality:

> Dodgy connections and poor quality make consultations a lot harder to do.

Participants also expressed concerns about inequitable access to suitable technology and the potential for this to lead to health inequalities:

> Not all patients have access to remote devices or may be elderly and struggle with technology or hearing over the phone.

> I feel that we are creating digital health inequalities which is not something I wish to support.

DISCUSSION

Summary

A majority of participants became less interested in general practice as a career due to the necessary and rapid rise in patient-clinician virtual visits and asynchronous communication (remote consultations) as a direct result of the pandemic, with a greater effect on those who were more interested in a career in general practice beforehand. This was compounded by the prospect of virtual visits becoming the default method of primary care consulting in the future. This raises the concern that general practice risks losing the students most motivated toward primary care at an early stage in their career, undermining efforts to positively promote this career path.[27] The reasons for a diminished interest for a career in general practice were related to a poorer medical student learning environment, changes in working practices, impact on patients and use of technology. Greater working flexibility was identified as a potential positive.

Strengths and Limitations

One strength of this study is the recruitment of students from six different medical schools across England and Wales. The brief questionnaire is likely to have improved the quality and reliability of data obtained; 89% of respondents submitted responses to optional free-text questionnaire items used for the thematic analysis which were placed toward the end of the questionnaire.[28] Similarly, the anonymity of the data collection

is known to encourage higher response rates.[29] The involvement of six different medical schools enables the authors to be confident the impact was widespread across curricula. Recruitment of medical student coauthors to the study team was based on involvement with the GP society at the authors' respective institutions. This, together with the distribution of the questionnaire through GP societies' social media groups, may have resulted in higher numbers of students engaging with the questionnaire who already had an initial interest in pursuing general practice as a career. To mitigate this, the student study team was encouraged to additionally distribute the questionnaire through other means, such as via social media pages for university year groups and other social media pages. Reassuringly, in the study population approximately one-third of participants reported being interested in a career in general practice prior to commencing their medical degree, which is similar to the proportion of newly-qualified junior (foundation) doctors appointed directly to general practice versus other specialty training programmes[23] and to reported interest during first year of study.[30] This gives the authors confidence that in this respect the study sample is likely to be representative of, and thus transferrable to, the UK medical student population.

Potential limitations of the study must be recognized. One such limitation is the potential for volunteer bias in the current study. The study sample was necessarily a convenience sample; it was not feasible to collect data on the number of people who saw the advert and thus the response rate. Therefore, it is possible that those included in the study were not wholly representative of the medical student population. In contrast to previous studies,[25] age and level of education prior to medical school were not associated with prior interest in a career in general practice in this study population. Though this study recruited only participants from UK medical schools, the increased use of virtual and asynchronous methods of consulting with patients is becoming widespread internationally. As such, we believe that our findings may resonate with medical students around the world.

Comparison With Existing Literature

Student participants reported that the increased proportion of primary care consultations conducted virtually and asynchronously during the COVID-19 pandemic had negatively impacted the clinical learning environment. This is particularly important as associations between the quantity and duration of clinical primary care placements at medical school with a career destination of general practice have previously been made,[16,31,32] and exposure to primary care placements in medical school positively influences students considering a career in general practice.[33] Medical students have also anecdotally expressed that a disproportionate number of clinical placements take place in secondary and tertiary care, potentially to the detriment of general practice.[34] Furthermore, negative attitudes and widespread stigmatization toward general practice experienced through a predominantly hospital-based life as a medical student may contribute to lack of interest in general practice.[35]

There has been recent debate about the appropriateness of maintaining total virtual or asynchronous triage in primary care in the UK as COVID-19 restrictions are relaxed.[36] The authors hope the perspectives of the future workforce captured in this study will inform this ongoing debate as well as strategies to increase the proportion of junior doctors applying for and entering general practice training. For example, medical schools should review their teaching practices to ensure all medical students are adequately trained in virtual visits and asynchronous communication.[9,37] This will allow students to participate in active learning rather than observation. Alternative, innovative approaches need to be considered to allow students sufficient access to face-to-face consulting with patients, including in patients' own homes and in simulation, with adequate time to complete full holistic assessments. We hope that the introduction of better preparation for new forms of consulting, such as the Society of Teachers of Medicine's Telehealth Curriculum, will increase students' confidence and restore their interest in GP careers.[38]

Whether virtual visits will remain a core part of primary care provision in the future remains to be seen.[39] Virtual visits and asynchronous communication have potential benefits for both patients (accessibility and flexibility) and clinicians (ability to manage workload, flexible working) when implemented successfully.[2] However, concerns remain that there are likely to be negative impacts on certain patient groups including, but not limited to, those who are less able to access the technology required to engage with telehealth, those who are less able to verbally communicate their symptoms and signs, and those who are less able to recognize important symptoms or signs to report.[40] This may include particularly vulnerable groups and those already affected by health inequity and inequalities including those with impairments of hearing and vision and those for whom English is not a first language.

CONCLUSIONS

The concerns expressed by the study population regarding the impact of virtual visits and asynchronous communication consultations have been expressed by patients and clinicians[40,41] and were the focus of UK media in the period before study recruitment opened.[20] Students were anxious about the lack of opportunities to perform physical examinations on patients and to pick up on important visual cues without face-to-face consultations. Students linked these concerns to reduced interest in pursuing careers in general practice. Medical programs need to urgently embrace training in virtual consulting, carefully evaluating its impact on student learning and socialization into primary care.

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Contribution Statement

J.P.L., K.S. and M.D.S. carried out the scoping review. J.P.L. and K.O. designed the study, the analysis plan, the protocol, recruitment materials and questionnaire. J.P.L., M.D.S., K.S., J.C., I.S.C.B., D.D., J.H. and S.A. were responsible for recruiting participants at their respective institutions. J.P.L. and K.O. supervised the recruitment, data collection and analysis and drafted the manuscript. J.P.L. carried out the quantitative data analysis. K.S., M.D.S., J.P.L. and K.O. carried out the thematic analysis of responses to the open-ended questionnaire items. All authors revised the manuscript for important intellectual content and approved the final version for submission.

Ethical Approval

Ethical approval was granted at the lead institution, the University of Warwick, by the Biomedical and Scientific Research Ethics Committee (BSREC) (reference BSREC 18/20-21), permission to recruit medical students was granted by the heads of Warwick Medical School. BSREC ethical approvals were reviewed by Swansea University Medical School Research Ethics Committee (SUMS REC) at Swansea University (reference NOEA 2020-02), King's College London Research Ethics Committee (KCL REC) at King's College London, and Faculty of Medical Sciences Research Ethics Committee (FMS REC) at Newcastle University (reference 7679/2020), prior to recruitment of students at those institutions. Further research ethics committee review was not required by University of Birmingham or Keele University. Local permissions to recruit students were granted by the heads of school or relevant research advisory committees for all institutions where participants were recruited from including, University of Warwick, King's College London, Swansea University, University of Birmingham, Keele University and Newcastle University. All participants provided prior informed consent.

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