Training tomorrow's doctors: the impact of a Student Selected Component in Global Health during medical school

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Abstract

Background

Several reports highlight the importance of global health education (GHE) for training tomorrow's doctors. In 2006, Newcastle University Medical School developed a Student Selected Component (SSC) in Global Health, which has since become increasingly popular. We followed up students who have undertaken the SSC in Global Health to assess the impact on their experience as practising clinicians and postgraduate career development.

Methods

We developed an electronic survey including questions about speciality choice, postgraduate qualifications, extracurricular activity and international work. Surveys were sent to 72 SSC participants identified between 2006–2017 through the Newcastle University Alumni and Supporters network and social media.

Results

Surveys were returned by 37 (51%) SSC participants; 25 (71%) and 16 (46%) believed the SSC had influenced their clinical practice and career choice respectively. Twenty-two (60%) obtained an intercalated degree programme, of whom nine (24.3%) did a Masters programme specifically in Global Health and four (10.8%) and two (5.4%) completed a Masters degree in Epidemiology and Control of Infectious Diseases respectively, both key themes within GHE. Four (11%) undertook and ten (29%) were considering postgraduate study related to global health, of whom three (8.6%) specified undertaking a Diploma in Tropical Medicine and Hygiene (DTM&H) and one (2.9%) studying a Masters degree in Public Health. Five (14%) had and 19 (54%) were planning to work abroad, with most referring to work in humanitarian or low resource settings and GHE programmes.

Conclusions

Participation in an SSC in Global Health may affect significant positive change in student's clinical practice and help inform academic and clinical career choice. Whilst a causative relationship cannot be inferred, the experience may support or increase the pursuit of further global health opportunities including additional qualifications, research and international health work. Medical schools that endeavour to produce graduates motivated to tackle the global health challenges of our society should champion comprehensive global health modules for students.

Background

It is well documented by health professionals, medical students and expert panels that global health is as an essential part of compulsory modern medical education (1–10). The UK government also has an ongoing global health strategy recognising the need to engage in global health in our globalised world, not least to support the National Health Service (NHS) and secure good health for people in the UK (11, 12). Despite this, the development of standardised Global health education (GHE) in UK medical schools has been arguably a slow process. In 2001, Newcastle University had no dedicated teaching on international health issues and a survey of medical students showed 56% were dissatisfied with the amount of global health teaching and 61% would welcome more in both the core curriculum and as a special module (13). Following a student's request, a Student Selected Component (SSC) in Global Health was established in 2006 and has since become increasingly popular (14). Students have continued to lobby for the inclusion of more global health in the compulsory curriculum, thus leading to increased formal global health teaching for all medical students (14). This trend has continued with Newcastle Medical School implementing a reformed global health curriculum in 2018 (15) and continuing to run an intercalated Master of Research (MRes) programme in Global Health. Evidence shows such growth in GHE occurring nationally, with a 2015 study of UK medical schools finding an increase in the number of institutions reporting including GHE in the core curriculum from 24% in 2006 (4/17 in the student survey reported by Dotchin et al. (14)) to 83% (according to medical school faculty) or 67% (according to students), and almost all offering optional global health programmes (16).

Since the development of the SSC, Newcastle University students in their fourth year (of five years) of medical school may undertake a six-week Global Health module covering weekly topics: Introduction to the epidemiology of major communicable diseases across the world, Non-communicable diseases and health systems, Climate change, aid and the philosophy of global health, Global maternal and child health, Global health policy, partnerships and governance and Migrant and refugee health and international health placements. Participants engage in a variety of lectures, seminars and clinic attendances, as well as a debate on relevant global health issues. Students also prepare presentations on topics pertinent to the week and are examined with a final presentation on a global health topic of their choice.

Although several works have argued the importance of GHE for training tomorrow's doctors, to date there is limited literature investigating the impact of GHE on student's postgraduate career development. Thus, we seek to follow up students who have undertaken the Newcastle University medical school SSC in Global Health between 2006–2017, in terms of how the SSC has impacted their experience as practising clinicians and postgraduate career development.

Methods

Survey design

We developed an electronic survey targeted at Newcastle Medical School alumni who have undertaken the SSC in Global Health using SurveyMonkey, an online survey development platform.

The survey included questions about advanced training and speciality choice, extracurricular activity, postgraduate qualifications, international work and the influence of the Global Health SSC on their clinical practice and careers.

Administration of survey

Past participants in the Global Health SSC were identified from records held by the current course administrator dating back to 2011. Before 2010, no data were retained by the University and no hard copies were available. The first student to undertake the SSC in 2006 was known to the faculty due to their involvement in the development of the SSC in 2006 (14). Thus, a total of 74 past SSC participants were identified from 2006 and between 2011–2017. Current Newcastle University medical students who had undertaken the SSC in 2018 and 2019 were excluded from the data set as they had not yet begun their careers.

Survey data were gathered from May to August 2019. Alumni who had not opted out of receiving communications were initially contacted with the survey through the Newcastle University Alumni and Supporters network on the 31st May and 18th June 2019. Following this, only 16 alumni completed the survey, therefore we decided to extend the survey deadline and share the survey through social media. Where possible, NRM sent the survey to SSC participants via the social media service Facebook. Eight alumni, for whom a profile could not be found on Facebook, were contacted through NHS email. Contact details for two participants could not be located through Facebook, NHS email or the professional networking service, LinkedIn. Another two alumni responded that they had not undertaken the Global Health SSC during their undergraduate studies and thus were excluded from the study. All communication regarding the survey included a copy of the cover letter and a link to the survey.

Analysis of survey responses

Descriptive statistics were calculated for quantitative analysis of the data. Qualitative analysis was conducted on narrative responses to open-ended questions by identifying and marking key themes.

Results

Thirty-seven (51%) of 72 students who had undertaken the Global Health SSC responded to the survey within the time frame. These participants had all completed the SSC between 2011–2017 and graduated between 2013–2019. Of 16 respondents who completed the SSC in 2017 during the fourth year of medical school, 10 subsequently undertook an intercalated degree year (on top of their 5-year medical degree), therefore graduated in 2019.

Table 1
Survey respondent characteristics

Characteristic	Previous SSC participants (n = 37) n (%)
Age range, years (mean)	23–31 (26)
Gender	Male: 10 (27) Female: 27 (73)
Year completed SSC (mode)	2011–2017 (2017)
Year graduated (mode)	2013–2019 (2018/2019)
Employment status	To commence Foundation Programme August 2019: 11 (30) Employed, working full-time: 22 (59) Locum: 3 (8) Not employed, not looking for work: 2 (5)
Stage of Career	To commence Foundation Programme August 2019: 11 (30) Foundation Programme: 12 (32) Speciality and GP training: 10 (27) Not in training: 4 (11)

Speciality Choice

The speciality choices of previous SSC participants were compared with those of UK medical graduates of 2015, one year after graduation (17), an age group similar to that of the study participants. Of previous SSC participants, one (2.7%) indicated Public Health as their top choice of speciality, compared with 0.9% of UK medical graduates, showing Public Health is one of the least popular choices of speciality amongst both groups (Table 2). Despite this, 16 (45.7%) of 35 respondents reported having considered applying to Public Health speciality training. The most popular choice of speciality for previous SSC participants and UK medical graduates was General Practice with 27.0% and 27.8% selecting primary care as their top choice respectively. The study also found that 10.8% of past SSC participants versus 1.4% of UK medical graduates were not interested in pursuing speciality or general practice training at all.

Table 2

Career speciality choices of previous SSC participants compared with UK medical graduates of 2015 one year after graduation

Speciality	Previous SSC participants (n = 37) n (%)	UK medical graduates of 2015* n = 3040 n (%)
Anaesthetics	2 (5.4)	480 (15.8)
Emergency Medicine	1 (2.7)	171 (5.6)
General Practice	10 (27.0)	844 (27.8)
Medicine	4 (10.8)	826 (27.2) Hospital medical specialities + Other medical specialities
Obstetrics and Gynaecology	3 (8.1)	164 (5.4)
Paediatrics and Child Health	5 (13.5)	261 (8.6)
Pathology	0	97 (3.2)
Psychiatry	1 (2.7)	165 (5.4)
Public Health	1 (2.7)	28 (0.9)
Radiology	2 (5.4)	92 (3.0)
Surgery	3 (8.1)	492 (16.2)
Other	1 (2.7) Tropical Medicine and Public Health	87 (2.9) Radiotherapy and oncology + Community health
Not pursuing speciality or general practice training	4 (10.8)	44 (1.4)
Not stated	0	105 (3.5)
*2015 data (17)		

Only one participant reported undertaking a rotation in Public Health during their two-year Foundation Programme. Three participants had accepted an Academic Foundation Programme (AFP) training post, two of whom stated their research project would be related to global health.

Further Global Health Education

Twenty-two (60%) previous SSC participants had undertaken an intercalated degree programme. Table 3 highlights the degree choices of respondents, with nine (24%) reporting completing a Masters' Programme specific to Global Health. Seven participants studied an MRes in Global Health and two

undertook a Master of Science (MSc) in Global Health and Global Health and Development respectively. Additionally, four (11%) participants undertook an MRes in Epidemiology and two (5%) did an MSc in Control of Infectious Diseases, both key themes within GHE. Eleven (26%) participants reported that their intercalated degree programme involved field research abroad, seven of whom indicated they carried out research in Tanzania, the other three undertaking research in one each of the Gambia, Sudan and Zambia.

Table 3
Intercalated degree programme subject choice of
previous SSC participants

Intercalated degree programme subject	Number
Global Health	9
Epidemiology	4
Control of Infectious Diseases	2
Medical Anthropology	2
Immunobiology	1
Philosophy	1
Reproductive and Sexual Health Research	1
Stem Cells and Regenerative Medicine	1
Not stated	1

When past SSC participants were asked to provide details of any further GHE undertaken elsewhere within the optional medical curriculum, responses fell mostly into two main themes. Firstly, arranging global health electives (five participants), four of whom specified travelling to low and middle-income countries (LMICs) in Sub-Saharan Africa and Southeast Asia, and secondly, attending global health conferences and presentations (three participants). Other optional GHE mentioned included undertaking an SSC in Infectious Diseases (one participant) and tailoring a critical appraisal assignment around a global health topic (one participant).

Four of 35 respondents indicated they had completed or were due to begin, postgraduate study related to global health since completion of medical school. Three alumni specified undertaking a DTM&H, one of whom had also completed the RANZCOG Diploma (Diploma of Women’s Health, Royal Australian and New Zealand College of Obstetricians and Gynaecologists), whilst one alumnus was studying an MSc in Public Health. Another 10 participants reported they were considering pursuing a further postgraduate qualification related to Global Health in the future, again with two specifying the DTM&H.

Extracurricular activity

Twenty-five (68%) study participants indicated that they were involved with a student global health organisation at a local or national level during medical school. Ten reported involvement with one organisation, 11 with two organisations and four with at least three organisations. The most common organisation students were involved with was Students for Global Health (formerly Medsin) (Table 4). This is perhaps the largest student global health network in the UK, which as of 2014–2015, was found to be established and active at 28 (85%) of 33 UK medical schools (16).

Table 4
Previous SSC participant involvement with student global health organisations during medical school

Student global health organisation	Number (n = 37) n (%)
Students for Global Health (formerly Medsin)	18 (49)
Homed	8 (22)
Students for Kids International Projects (SKIP)	7 (19)
Sexpression:UK	4 (11)
Marrow	3 (8)
Healthy Planet UK	2 (5)
Friends of Médecins Sans Frontières (MSF)	2 (5)
International Federation of Medical Students' Associations	1 (3)
Kids Action Overseas (Kaos)	1 (3)
Student Action for Refugees: STAR	1 (3)
Student Stop AIDS Campaign	1 (3)
Universities Allied for Essential Medicines (UAEM)	1 (3)

Since completing medical school, 16 (46%) of 35 respondents indicated they were involved with extracurricular activities. Of the 19 participants who reported no involvement with extracurricular activities, eight had just graduated in 2019 and five had graduated in 2018 and were currently undergoing their Foundation Programme Year One. Excluding the 10 participants who had just graduated, a greater proportion of 14 out of 25 (56%) participants reported extracurricular activity since completion of medical school. Activities included teaching, delivering health-related presentations, committee members of non-profit organisations, research, mentoring youth and working in volunteer clinics (Table 6). Five participants specified details of extracurricular activities related to global health following completion of medical school. These included carrying out leadership roles such as Junior Doctor Sustainability Fellow,

Improving Global Health (IGH) Fellow and co-founding the North-East Global Health Network (three participants), as well as mentoring subsequent IGH fellows and MRes Global Health students undergoing research in Tanzania (two participants). Other activities mentioned were volunteer work with refugees (two participants), participation in the Global Health Film Festival (one participant) and work in expedition medicine (one participant).

Table 5
Previous SSC participant involvement with extracurricular activities since completing medical school

<i>Extracurricular activity</i>	Number (n = 35) n (%)	Number* (n = 25) n (%)
<i>Teaching</i>	10 (29)	10 (40)
<i>Health-related presentation</i>	8 (23)	7 (28)
<i>Non-profit committee member</i>	3 (9)	2 (8)
<i>Research</i>	3 (9)	2 (8)
<i>Youth mentorship</i>	2 (6)	2 (8)
<i>Volunteer clinic</i>	1 (3)	1 (4)
<i>Other</i>	2 (6)	2 (6)
*adjusted for participants who had just graduated from medical school.		

International Work

Five (14%) of 35 respondents had worked outside of the UK, whilst 19 (54%) were considering working abroad in the future. Responses regarding previous or planned international work could be categorised as humanitarian work (four participants), work in low resource setting (three participants), international GHE programmes including the IGH programme and Diploma in Tropical Medicine East African Partnership (two and one participants respectively), work with the World Health Organisation (two participants), work in Australia and New Zealand (two participants), expedition medicine (one participant) and research (one participant). Two participants also mentioned living outside the UK before attending medical school and thus returning after completing training.

Knowledge and Attitudes

Twenty-five (71%) of 35 respondents stated that the Newcastle medical school SSC in Global Health had influenced their clinical practice. Eight (23%) participants felt it did not and two (6%) were unsure. Table 6

shows common themes identified when participants were asked to describe the most significant influence on their clinical practice.

Table 6

Themes Identified From Responses to the Question “Describe the most significant influence of the Newcastle medical school SSC in Global Health on your clinical practice”

Theme	Number (n = 22)	Quotes
Motivation to pursue additional global health education/training	4	“Advice from doctors in how to get into working in a global health setting”. “...facilitated MRes with research in Tanzania / inspiration to apply for DTM&H”. “Influenced my preferences in having one of my SHO rotations in Paediatric Infectious Diseases”. “Played part in decision to apply to Masters”.
Importance of maintaining ethical and professional standards	2	“A session on ethical electives most likely influenced my clinical practice during the elective period and meant I was more cautious about not doing anything I would not be comfortable doing in the UK when abroad.” Listening to how best to improve global health outcomes without crossing ethical or professional boundaries.

Sixteen (46%) of 35 respondents believed the SSC played a role in their career decisions, ten (29%) believed it did not, and nine (26%) were unsure. Table 7 shows common themes identified when participants were asked to describe the most significant influence on their career choice. Although perspectives on career influence of the Global Health SSC were largely positive, one participant remarked that the experience highlighted that despite having an interest in global health, they did not want to pursue it as a career.

TABLE 7 Themes Identified From Responses to the Question “Describe the most significant influence of the Newcastle medical school SSC in Global Health on your career choice”

Theme	Number (n=16)	Quotes
Knowledge of career paths combining clinical work with engagement in global health	4	"Demonstrat[ed] it's possible to work in GH alongside a clinical NHS job." "Demonstrated the different opportunities to get involved with global health as a clinician and that this is possible for multiple specialities, and at more stages in our career than I had previously realised." "...introduced me to ways of incorporating global health into my career that I hadn't previously thought of." "Made me consider GP as a possible speciality to train in - considering the large set of skills GPs need to function in the community and how useful they can be in any setting."
Motivation to pursue work abroad and in developing countries	4	"I also want to take some periods to work abroad, or in partnerships between NHS trusts and those abroad" "Now keen to consider careers in developing countries and outside of [the] UK." "Reinforced my interests in tropical medicine and clinical medicine in developing countries." "Working abroad."
Motivation to pursue research in global health	4	"Encouraged me to do an MRes in global health, which lead me to getting an AFP with research in ID/global health. In my future career, I am keen to continue a research component which I don't think I would have considered previously." "...GPs can be heavily involved in public health research of a particular community, and [it] made me realise that is an option." "...influenced my decision to undertake research in Tanzania with a Paediatric cohort". "Undertaking my AFP in global mental health."
Awareness of ethical implications of working abroad	2	"made me more aware of the ethical implications of work abroad and factors to consider in respect to this." "listening to how best to improve global health outcomes without crossing ethical or professional boundaries."
Commitment to pursuing work with greater public health effect	2	"[Influenced me] to try and pursue a career that will be sustainable and have large public health effect." "It made me question how big an impact on health being a doctor has...and has made me consider pursuing work in health policy and public health, potentially alongside clinical practice."

Discussion

Principal findings

Of medical students who participated in the SSC in Global Health at Newcastle University between 2011–2017, 71% reported influence on their clinical practice and 46% noted impact on their career decisions. Whilst a causative relationship cannot be inferred, many alumni have pursued, or are considering, further global health education and extracurricular activity outside of their training programme, as well as international health work, often in underserved communities. Despite this, there was limited interest in Public Health speciality training, consistent with average findings from UK medical graduates in 2015.

Comparison with prior studies

Previous studies are predominately US-based and focused on the impact of global health experiences abroad. In 2001–2002, a study of participants on the University of Wisconsin International Health Fellowship Program (IHFP), involving intensive coursework followed by field experience in a developing country, found most fellows experienced a positive impact on their careers (18). Four to seven years later, fellows were more likely to engage in primary care specialities than those without fellowship experience, and many went on to work with underserved populations and engage in community health activities (18). SSC participants were also more likely to choose a career in General Practice over other specialities, though this was in keeping with their UK counterparts (Table 2). Similarly, between two and eight years after completion, 46% of SSC alumni had engaged in extracurricular activities, mostly teaching and delivering health-related presentations (Table 5), though several also specified working in humanitarian or low resource settings. These results support previous literature suggesting global health experiences, including electives abroad, can inspire or reinforce student's motivation to volunteer, work with underserved populations and work abroad (19–23).

Several students who undertook the SSC in Global Health subsequently pursued, or were considering, other postgraduate qualifications in public health. Likewise, IHFP fellows were more likely to obtain Master of Public Health (MPH) degrees than their US counterparts (18). Despite this interest, only one SSC participant selected public health as their top choice of speciality, however, SSC alumni were comparatively more likely to choose public health training than UK medical graduates (2.7% versus 0.9%). Similarly, a 1995 survey of 60 Columbia University graduates between 1979–1994, found those who took an elective course in public health were more likely to specialise in preventive medicine than a comparative group of their counterparts (3% versus < 0.5%: $P = 0.001$) (24). Physicians that had studied an MPH were more likely to pursue careers in academic, governmental, and corporate practice settings and spend more time dedicated to non-clinical work (24). Likewise, a 2007–2009 cohort study at Tulane University showed, compared to those without an MPH, medical graduates with an MPH were more likely to work in academic or government institutions 10–20 years after graduation. The study also showed that MPH holders were 39.84 times (95% CI 12.13–107.38) more likely to practice public health, as well as conduct public health research and produce scholarly works (25).

Strengths and weaknesses of the study

This study contributes a UK perspective to an evolving body of research exploring the impact of global health teaching on medical students, in terms of clinical practice and career choice. Understanding this is essential to the case for increased GHE for medical students, contested by increasing time pressures on an already oversubscribed medical curriculum. The General Medical Council (GMC)'s 'Outcomes for Graduates' 2018, gives considerable emphasis to global health knowledge and skills (26); investigating the impact of global health modules is, therefore, useful to establish if this method of delivering GHE can remedy current gaps in core curricula, by providing students with fundamental global health competencies, whilst allowing them the choice of further in-depth study.

This study has several limitations. The small sample size means the results are less reliable and must be interpreted with caution. As only 51% of eligible participants responded, the results do not reflect the entire cohort of SSC Global Health alumni and not all global health-related activities were necessarily identified. Furthermore, two of the total 37 survey participants did not complete all mandatory questions in the survey, leaving some questions with only 35 respondents. A large proportion of respondents were more recent graduates or undergoing the UK Foundation Programme, therefore had had less time to explore further global health opportunities. The questions on perceived impact on clinical practice and career choice respectively rely on introspective reporting and lack objectivity. There was an inherent risk of reporting bias as those who completed the survey were more likely to have maintained an interest in global health and may have over-reported the positive impacts on their clinical practice and career to favour the inclusion of global health modules in the curriculum.

Implications for policymakers

Eaton et al. (27) suggest that whilst the most effective way to deliver GHE is to integrate global health teaching components within mainstream curricular teaching, most medical schools rely on a contributory model of global health content alongside the core curriculum, such as SSCs. Indeed of 26 UK medical school faculty reporting optional global health teaching, 23 reported offering a special module (16). Whilst we do not propose a causal relationship, an SSC in Global Health may be associated with a positive influence on participants' clinical practice and has at least a reinforcing effect on career choice, in terms of seeking further global health opportunities. Notably, several participants reported gaining a better understanding of patients in a global context, including socio-economic and cultural aspects of health, leading to a more holistic approach (Table 6). Thus, strengthening existing curricular infrastructure and increasing participation in comprehensive global health modules across UK medical schools can aid the development of graduates fit for practice in a global workplace, including the UK NHS.

Future research directions

Further exploration of the influence of GHE on postgraduate clinical practice and career development is required. Study participants may be followed up again, once they have had longer to develop their

careers, to gather additional information and provide comparative data for analysis. Although the sample was appropriate to test an initial hypothesis, a larger confirmatory study is needed to test the associations identified between global health training and postgraduate clinical practice and career development. A cohort study would be better suited to characterise the causal impact of global health teaching on participants with similar baseline characteristics.

Conclusions

Global health modules in the medical curriculum may affect significant positive change in students' clinical practice and help inform their career choice. As many students may have been interested in global health before choosing the SSC, a causative relationship cannot be inferred. However, SSC Global Health alumni are likely to pursue further global health opportunities including carrying out postgraduate degrees and research related to Global Health and participating in international health work. Medical schools that endeavour to produce graduates motivated to tackle the global health challenges of our society should champion comprehensive global health modules for students.

Practice points

- Global health modules in the medical curriculum can enhance student's competency to work in an increasingly globalised workplace.
- Medical student participation in global health modules should be facilitated and encouraged to aid positive career development.
- SSCs in Global Health provide an interim solution for medical schools endeavouring to integrate global health components in oversubscribed mainstream curricular teaching.

List Of Abbreviations

AFP	Academic Foundation Programme
DTM&H	Diploma in Tropical Medicine and Hygiene
GHE	Global health education
GMC	General Medical Council
IGH	Improving Global Health programme
IHFP	International Health Fellowship Program
LMICs	Low and middle-income countries
MPH	Master of Public Health
MRes	Master of Research

MSc	Master of Science
NHS	National Health Service
RANZCOG	Royal Australian and New Zealand College of Obstetricians and Gynaecologists
SSC	Student Selected Component
UK	(The) United Kingdom (of Great Britain and Northern Ireland)
US	(The) United States (of America)

Declarations

Ethics approval and consent to participate

Ethical approval was sought for this study through the completion of Newcastle University's Online Ethics Form on the 11th April 2019. Based on the answers provided, the project was categorised as (ethically) low risk and did not require further review by a Research Ethics Committee. Research participants were contacted with a copy of the survey cover letter, University Ethics Form and a link to the electronic survey. Consent to participate was implied by completion and return of the survey. The University was satisfied that the project met its ethical expectations and granted its ethical approval.

Consent for publication

Not applicable.

Availability of data and material

The datasets generated and/or analysed during the current study are not publicly available due them containing information that could compromise research participant privacy/consent, but are available, after deidentification, from the corresponding author on reasonable request.

Competing interests

RW leads the SSC Global Health at Newcastle University Medical School. The authors alone are responsible for the content and writing of this article.

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Authors' contributions

NRM and RW conceived and designed the study. NRM led the data collection and analysis, wrote the original draft and oversaw the editing of the final manuscript. Both authors contributed to drafting and revision of the article, and read and approved the final manuscript.

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