

Early Years Research Elective: Changing Perspectives and Dealing with Uncertainty

Aleksander Dawidziuk*^{}, Rishikesh Gandhewar*^{} and Yash Kulkarni*

Department of Medicine, Imperial College London, London, UK.

Journal of Medical Education and Curricular Development
Volume 7: 1–5
© The Author(s) 2020
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2382120520965999



ABSTRACT: Uncertainty is ever-present within the medical profession. To effectively manage uncertainty, future doctors must develop key competencies including resilience, creativity and adaptability along with the capacity for collaboration and embracing multiculturalism. The authors believe that attending an overseas clinical research placement as a junior medical student can benefit medical education by offering an early opportunity to develop these qualities. These views are supported by reflections on a clinical research module and placement in Guangzhou, China completed by the authors during the second year of medical school and aims to highlight key learning opportunities.

KEYWORDS: Medical students, research elective, uncertainty, resilience, adaptability, collaboration, multiculturalism, curriculum

RECEIVED: July 16, 2020. **ACCEPTED:** September 22, 2020.

TYPE: Perspective

FUNDING: The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The article processing charge was funded by Imperial College School of Medicine.

DECLARATION OF CONFLICTING INTERESTS: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

CORRESPONDING AUTHOR: Rishikesh Gandhewar, Department of Medicine, Imperial College London, South Kensington Campus, London SW7 2AZ, UK.
Email: rishikesh.gandhewar16@imperial.ac.uk

Introduction

In 1954, Sir William Osler, a pioneer of medical education, claimed medicine to be ‘a science of uncertainty and an art of probability’.¹ This notion is still relevant today and a doctor’s tolerance of uncertainty has become an increasingly necessary skill to thrive in an everchanging and demanding field. The recent COVID-19 pandemic has highlighted this from an individual to institutional level. Doctors have been forced to navigate uncertainty in many forms, from the virus’ epidemiology and transmission pattern to its treatment options.^{2–4} Hence, it is essential that medical education equips future doctors with the means to overcome uncertainty. Currently, the focus on evidence-based medicine helps to convey uncertainty from a scientific perspective.⁵ However, to prevent consequences of uncertainty, such as physician burnout and reduced patient outcomes, it is crucial that uncertainty is also tackled on a human level.

To achieve this, medical schools should firstly introduce students to the topic of uncertainty and secondly provide opportunities to develop the relevant proficiencies to deal with uncertainty. In this article, we share our experience completing a novel and innovative early years clinical research module in Guangzhou, China. We spent 8 weeks in clinical research, with the aim of presenting our findings. Roughly half of this time was conducting research at the Guangzhou Institute of Respiratory Disease studying obstructive sleep apnoea, where we took an immersive approach to medical research, including protocol design, data collection and data processing. As United Kingdom medical students, it was a unique experience to be involved in collaborative research abroad as early as the second year in our undergraduate education. Whilst this provided us with an intimidating challenge, it importantly was an opportunity to remove

ourselves from the comfort of the lecture theatre. We developed essential skills including resilience, teamwork and adaptability, which make up crucial attitudes in dealing with uncertainty. In this article, we explore each of these facets and how they related to our experience. We believe having this opportunity early in our medical education gave us a foundation to embrace the difficulties and uncertainties of clinical medicine and medical research in subsequent years. We believe our research experience in Guangzhou to be in alignment with the reported benefits of international health electives, however, these typically occur towards the end of undergraduate training. Students report attitudinal changes such as a greater appreciation for the importance of cross-cultural communication and providing care to the underserved.⁶

Selection for overseas placements was based upon a personal statement. A range of different national and international destinations were chosen, with groups ranging from 6 to 15 students. 6 students, split into subgroups of 3, were selected to conduct their research in China. The placement aimed to foster clinical innovation by providing us with our first formal research project. In preparation, we completed a ‘Research, Design and Statistics’ module aiming to make us proficient in the theory behind research and spent 2 weeks gaining scientific knowledge for our projects with support from tutors. Prior to our attachment in Guangzhou, we spent a day undertaking team-building exercises. We were signposted to uncertainty during this time through a series of imaginary clinical dilemmas we had to work through. On completion of this module, we returned to another set of scenarios, which were part of a debrief session. Whilst in China, we lived as a group of 6 but worked separately as a group of 3 with no support staff on site. The general work-like setting resulted in more responsibility and focus, however, the critical challenges were the cultural shift and immersive experience. This required us to assimilate

*Contributed equally to this study.



on both a social and professional level, from ordering food at local restaurants to presenting our findings to the laboratory. During our first week, we were expected to design a protocol based upon specifications given to us, followed by a few weeks of data collection and finally data analysis and interpretation.

Farquhar et al. report a need for qualitative information regarding medical student perspectives on matters including resilience and communication. We hope dissecting this experience can provide useful insight into how medical education can introduce further opportunities to prepare students for the uncertainties of medicine.⁷

Resilience

The nature of medicine lends itself to difficult circumstances. It is during these times the temperament and resilience of a doctor are tested. In 2018, the General Medical Council outlined that 'newly qualified doctors must be able to recognize complexity and uncertainty . . . and develop confidence in managing these situations', highlighting its importance in medical education.⁸ A lack of resilience can cause emotional exhaustion leading to ongoing stress and burnout. Furthermore, poor coping mechanisms can lead to doctors prescribing excessive tests and a reluctance in disclosing information to patients.^{9,10} Some resilience strategies are taught at medical school though most tend to be theoretical. Whilst this is useful in raising awareness of the issue, focus groups have highlighted that an effective method to increase resilience is via 'perspective changes with time and experience'.⁷ Whilst this was in relation to clinical practice, the main notion was that through experience, students were able to build confidence and prioritise the key skills required for becoming a doctor. In a similar train of thought, this novel module acted to provide us with an experience that rapidly and abruptly placed us in an unfamiliar environment.

During our first week at Guangzhou, we were promptly introduced to a longer and more demanding schedule than we were used to, with the Chinese students working from 9 am till 7 pm including weekends. We were then given the responsibility of presenting our first week's findings to the research group. Importantly, this task was not scored and thus removed the restrictions of a mark scheme we had been accustomed to. However, we still had the responsibility of representing ourselves and our university. We found that in these circumstances we were pushed to work in a completely different environment with different expectations and were able to successfully adapt to this. After presenting our findings we were left with a great sense of fulfilment we had not previously felt at medical school and a sense of confidence that we were able to work together to meet these added expectations. In the years after, we have found ourselves in similar situations. Notably, moving into the new environment of clinical medicine where there are different responsibilities and ways of learning. Moreover, for our intercalated research years we all took unorthodox routes, including spending the year in Bioengineering or time overseas. Whilst these remained daunting transitions, the confidence we had

gained through completing the early years module meant we did not panic about this new environment but instead could trust in our ability to deal with uncertainty. It is crucial that medical education finds controlled ways of building student perspectives and self-esteem to build resilience and prevent physician burnout.

Adaptability and creativity

In any rapidly changing field, it is essential for university graduates to develop agility, understood as an ability to quickly adapt or evolve in response to dynamic circumstances.^{11,12} To be able to manage uncertainty, medical students need to develop adaptability, creativity and problem-solving skills, which are crucial for short-term dealings in everyday clinical situations and long-term changes to medical practice. Current medical school curricula allow students to develop these attitudes, however, we believe that the early years research module we completed allowed us to acquire these characteristics earlier and benefit more from future teaching opportunities in the following years.

Teaching problem solving skills is well established within all medical school curricula since they underlay the diagnostic process.¹³ Approaches such as problem-based learning, case-based discussions and preparation for practical examinations, such as OSCE or PACES, are effective ways of developing this skillset.¹⁴⁻¹⁶ Adaptability to new circumstances is shaped well by attending clinical placements with various medical and surgical teams at different locations. Moreover, facing numerous patients on the wards and in the consultation rooms creates the ability for behavioural adaptation necessary for effective patient-centred communication.¹⁷ However, some of these skills are developed only by senior medical students and the quality of education varies significantly, depending on the engagement of the clinical teachers. What is more, creative thinking and ability to find solutions to new situations remain underrepresented in the curricula of medical schools.¹⁸

We believe that completing an early years clinical research module has proved beneficial for building our agility as medical students. Exposing junior students to unfamiliar settings pushes them to adapt quickly. To overcome institutional, cultural and communication barriers, students need to problem-solve and come up with creative solutions to adapt and benefit from the experience. During our research exchange in Guangzhou, we attended clinics and worked at the research institute with different research groups. With both language and cultural barriers, we had to quickly build relationships with Chinese students and doctors to allow us to take histories and perform polysomnography procedures. Being pushed to make new connections and constantly trying to understand the environment, even though uncomfortable, boosted our abilities in finding solutions to completely new problems. Furthermore, engaging in clinical research as pre-clinical medical students forced us to think laterally, after being asked to develop an updated protocol for an already established clinical trial. In

China, we did not have the standard research resources provided by our university, including journal subscriptions, support from our tutors or even Google search engine. We had to think creatively to overcome these barriers and succeed.

Agility developed early in medical education has the potential to benefit students during their clinical years. Being more agile from the first clinical attachment allows for better management of uncertainty in the clinical setting and hence improves learning within the multidisciplinary team and during patient encounters. We believe that our research experience in China prepared us for hospital and general practice rotations with attitudes useful for building new professional relationships with junior and senior doctors quickly.

Multiculturalism

Our experience in Guangzhou exposed us to a vastly different culture to any we had previously encountered. Multiculturalism is now a huge part of the modern world. Reflecting on our experience highlighted benefits for our development within the medical profession and dealing with uncertainty.

It has been mandated that medical education must address both the needs of an increasingly diverse society and the disparities in health care.¹⁹ Medical schools have sought to address multicultural education through a wide range of programmes in cultural competency and this has mostly been put into practice by means of classroom lecturing. These usually include teaching skills such as the use of interpreters and stereotypical behaviours for specific cultural groups. However, a major critique of this type of learning is that although students develop 'cultural competency' this equates more to a checkbox understanding of the subject as opposed to a real awareness of other cultures and changes in students' perspectives. Students report that in teaching sessions there may be a lack of time to form an intimate understanding of other cultures.²⁰ During our immersive experience in Guangzhou, we were left unsupervised to carry-out our daily living, requiring us to interact with locals outside of the medical setting and understand the local culture through first-hand observation. Our learning went far beyond a surface competency and extended to some of the more subtle but important aspects of cultural education. Learning cultural humour through making friends and engaging in social activities, such as sports and musical activities, enabled us to later interact with patients and laboratory members with greater empathy, comfort and humanity. Coming back to London for our clinical placements during our following years of undergraduate training, this has been an experience that we believe to have significantly improved our subsequent patient interactions by extending these attitudes.

One specific experience during a respiratory clinic highlighted the disparities that remain in health care availability. Hearing of a patient who had travelled across China to receive an X-ray scan and short appointment shone light on this. Meeting this patient and understanding his hardship

personally made us aware of this disparity through visceral experience. 'Critical consciousness' is the concept of placing medicine in a social, cultural and historical context coupled with the search for appropriate solutions.¹⁹ Developing our critical consciousness in this way made us reflect more deeply on our own society and the people affected by its problems. Seeing the disparities in medical treatment here demonstrated that there may be similar disparities due to socioeconomic reasons, racial prejudices and inequality around us everywhere. This has recently become obvious with the growth in popularity of the Black Lives Matters movement. The increase in awareness of these problems through development of a critical consciousness allows us to understand societal problems and see them as issues of public health concern.²¹ The outcome of this type of education is social justice and progression towards the delivery of high-quality medical care to all. This change of perspective gives us a greater appreciation of where patients have come from and their background before any clinical interaction. This has allowed us to confidently approach patients despite uncertainties of their culture and how this reflects health beliefs.

International collaboration

Fostering international collaboration in scientific research can accelerate the efficiency, relevance and ability to generalise findings.²² In an increasingly connected world, multicultural awareness improves the functioning of a team for the benefit of medical research. The increase in emergence of shared burdens of disease between countries, such as COVID-19, obesity or Ischaemic Heart Disease, demonstrates that international collaboration will have a key role in the future of medicine. Thus, the appropriate skills to work well within a culturally diverse team remain pertinent to medical students. Being part of such a team during our time in China meant drawing on experience and skills from members with different backgrounds, abilities and experience leading to innovative thinking, more flexibility and greater decision-making. Diverse groups have been shown to be more effective in identifying and solving problems.²³ On joining a new team at the sleep laboratory in Guangzhou, we first sought to observe and understand the established team culture. After gleaning knowledge of the subject and team culture we were better placed to add our own perspectives to the task. In our specific example, coming from a patient-focussed medical school education, we designed a patient satisfaction survey, which was used in the study to add a subjective element to the project and to improve the overall research. Conversely, our perspectives were changed with regard to the value of resourcefulness and lateral thinking that were shown to us through the design of a low-cost sleep device by the team. Since switching to previously established multidisciplinary teams is common with each new hospital placement as an undergraduate medical student, we believe this experience prepared us for this style of teamwork during future clinical years.

Conclusion

Two years after completing the overseas early years clinical research module, we can clearly see some of the benefits for the next stages of our career progression (Figure 1). We became more resilient and adaptable to new situations, which helped us in completing intercalated BSc degrees in Biomedical Engineering or continuing medical research abroad. We also felt more confidence in our communication and collaboration skills when beginning clinical placements. We believe that wider adoption of such a module in medical schools has the potential to make students more comfortable with uncertainty and prepare them for the challenges of their future careers. We can appreciate several institutional barriers to organising a widespread research experience similar to the one we participated in, including financial and organisational obstacles. In these cases, we believe the same learning opportunities could be achieved on a more manageable scale through electives to other national regions, as well as short term, non-graded projects using real patient data to mirror our perceived benefits. We believe signposting to dealing with uncertainty alongside group placement allowing for shared experience and space for informal subjective reflection maximized our perceived benefits. Modules involving student wellness programs and

stress-management techniques, such as mindfulness, would also offer curriculum modalities addressing similar objectives in dealing with uncertainty and changing perspectives.⁷

Acknowledgements

We would like to thank Prof. Yuan-Ming Luo, supervisor of our research experience at the Guangzhou Institute for Respiratory Disease and Imperial College School of Medicine for organising the overseas research experience module.

Authors' Contributions

AD, RG, and YK equally contributed in concept of the work; drafting and revising the article; and for the approval of the version to be published.

ORCID iDs

Aleksander Dawidziuk  <https://orcid.org/0000-0001-5702-049X>

Rishikesh Gandhewar  <https://orcid.org/0000-0002-8778-1465>

REFERENCES

1. Bean WB. Sir William Osler: aphorisms from his bedside teachings and writings. <https://philpapers.org/rec/BEASWO>. Updated 1954. Accessed September 20, 2020.
2. Ueda M, Martins R, Hendrie PC, et al. Managing cancer care during the COVID-19 pandemic: agility and collaboration toward a common goal. *J Natl Compr Canc Netw*. 2020;18(4):1-4.
3. Chater N. Facing up to the uncertainties of COVID-19. *Nat Hum Behav*. 2020;4:439.
4. Anderson RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet*. 2020;395:931-934.
5. The Lancet. Uncertainty in medicine. *Lancet*. 2010;375:1666.
6. Thompson MJ, Huntington MK, Hunt DD, Pinsky LE, Brodie JJ. Educational effects of international health electives on U.S. and Canadian medical students and residents: a literature review. *Acad Med*. 2003;78:342-347.
7. Farquhar J, Kamei R, Vidyarthi A. Strategies for enhancing medical student resilience: student and faculty member perspectives. *Int J Med Educ*. 2018;9:1-6.
8. General Medical Council. *Outcomes for Graduates 2018*; London: General Medical Council; 2018.
9. Kim K, Lee Y-M. Understanding uncertainty in medicine: concepts and implications in medical education. *Korean J Med Educ*. 2018;30:181.
10. Wright B, Richmond Mynett J. Training medical students to manage difficult circumstances - a curriculum for resilience and resourcefulness? *BMC Med Educ*. 2019;19:280.
11. Pipe TB, Buchda VL, Launder S, et al. Building personal and professional resources of resilience and agility in the healthcare workplace. *Stress Heal*. 2012;28:11-22.
12. Tugade MM, Fredrickson BL. Resilient individuals use positive emotions to bounce back from negative emotional experiences. *J Pers Soc Psychol*. 2004; 86:320-333.
13. Shin HS. Reasoning processes in clinical reasoning: from the perspective of cognitive psychology. *Korean J Med Educ*. 2019;31:299-308.
14. McLean SF. Case-based learning and its application in medical and health-care fields: a review of worldwide literature. *J Med Educ Curric Dev*. 2016;3:JMECD. S20377.
15. Ginzburg SB, Deutsch S, Bellissimo J, Elkowitz DE, Stern JN, Lucito R. Integration of leadership training into a problem/case-based learning program for first- and second-year medical students. *Adv Med Educ Pract*. 2018;9:221-226.
16. Ginzburg SB, Schwartz J, Gerber R, et al. Assessment of medical students' leadership traits in a problem/case-based learning program. *Med Educ Online*. 2018;23:1542923.

Competency area

Resilience

Learning Opportunity

- Placed in a safe but unknown environment
- Forced to overcome novel barriers to task completion

Competency area

Multiculturalism

Learning Opportunity

- Immerse in foreign culture and build bond with locals
- Develop empathy and increase critical consciousness

Competency area

Creativity

Learning Opportunity

- Move from a theoretical to hands on approach
- Opportunity to think laterally and problem solve

Competency area

International Collaboration

Learning Opportunity

- Build a global perspective
- Understand team dynamics across borders

Figure 1. An overview of the different competency areas that can be developed through an early years research elective and the specific learning opportunities that each provides.

17. Carrard V, Schmid Mast M, Jaunin-Stalder N, Junod Perron N, Sommer J. Patient-centeredness as physician behavioral adaptability to patient preferences. *Health Commun.* 2018;33:593-600.
18. Lippell S. Creativity and medical education. *Med Educ.* 2002;36:519-521.
19. Kumagai AK, Lyson ML. Beyond cultural competence: critical consciousness, social justice, and multicultural education. *Acad Med.* 2009;84:782-787.
20. Roh H, Nirta L. Medical students interact with multicultural patients to learn cultural diversity. *Korean J Med Educ.* 2018;30:161-166.
21. García JJJ, Sharif MZ. Black lives matter: a commentary on racism and public health. *Am J Public Health.* 2015;105:e27-e30.
22. Aarons GA, Seijo C, Green AE, et al. Fostering international collaboration in implementation science and research: a concept mapping exploratory study. *BMC Res Notes.* 2019;12:778.
23. Ganguly A, Faulkner C, Sendelbach D. Association of group composition diversity and performance outcomes in a pre-clerkship team-based learning program. *Med Teach.* 2019;41:1060-1064.