Perceptions of a research honours programme embedded in a Bachelor of Medicine, Bachelor of Surgery degree: "The worst and best years of my life"

E. M. Anderson, K. Johnston, R. Gunnarsson & S. Larkins

Abstract

Content: Although clinician-researchers are an essential part of the health workforce, the number of clinical researchers is declining. Student participation in research during medical school has been shown to promote a future interest in research. Therefore, to promote clinical research, it is important to evaluate educational pathways and the impediments to students undertaking research at medical school.

Methods: Semi-structured interviews were conducted to identify the challenges, benefits and enablers for students who are undertaking or have graduated from an embedded research honours degree in the Bachelor of Medicine, Bachelor of Surgery (BMBS) degree. Two researchers performed an ongoing thematic analysis. Data collection continued until data saturation was reached. Codes were reviewed and organised into overarching themes.

Results: Participants' two main reasons for undertaking honours were an interest in research and to enhance career prospects. Lack of research skills, workload and support were identified as challenges, and peer relationships and available support were enablers.

Conclusions: The embedded honours model provides research training and the opportunity to engage with and contribute to the research arena.

Keywords: evaluation; undergraduate; medical career choice; medical education research; student support.

College of Medicine and Dentistry, Anton Breinl Research Centre for Health Systems Strengthening, Australian Institute of Tropical Health and Medicine, James Cook University

Correspondence
Emily May Anderson
PhD candidate
College of Medicine and Dentistry
James Cook University
1 James Cook Drive
Townsville, QLD 4811
Australia
Tel: +61 7 4781 5107
Email: emma.anderson2@my.jcu.edu.au

ISSN 1442-1100

Introduction

Building a cadre of clinician-researchers is an important requirement for strengthening the current and future health and medical research workforce (Dickler, Fang, Heinig, Johnson, & Korn, 2007; Hayward et al., 2011). In Australia, net attrition from the medical research workforce spanning the decade 2009–2019 is projected to range from 43% for the 40–49 year old age group, increasing to 77% for 50–59 year olds (Schofield, Meachem, West, Kavallaris, & Callander, 2011). Less-than-optimal recruitment to higher degree by research (HDR) programmes, such as masters by research and PhD, is not reflective of the degree of interest in research reported by Australian medical graduates (Carberry & Dumbrell, 2012a, 2012b; Schofield et al., 2011).

Various barriers to undergraduate medical students and junior doctors engaging in research activities have been identified. These include work and study commitments, lack of research skills and supervision, limited job security, poor remuneration, extended training programmes and negative perceptions of academic medicine (Galletly, Chur-Hansen, Air, & Chapman, 2009; Hauser & McArthur, 2006; Hyde, 2007; Kieu, Moore, Hunter-Smith, Spychal, & Nestel, 2011; Myint, MacLullich, & Witham, 2006). Conversely, interest in the field of research, and the perceived value of qualifications and benefits for career progression, have been described as motivating factors for pursuing training in research (Kieu et al., 2011). The Australian Medical Association identified additional enablers as flexible entry and exit points, strong mentors, incentives and a strong health research culture (AMA, 2013).

Traditionally, in Australia, an honours degree has been the standard gateway to a higher research degree and academic career. The term "honours" can be interpreted in a variety of ways in different disciplines, universities and countries (Kiley, Boud, Manathunga, & Cantwell, 2011). For example, "honours" may be interpreted as a signal of merit for outstanding academic achievement in an area of coursework study or, alternatively, as a preparatory programme, structured in various ways, for entry to a HDR programme (Kiley et al., 2011). In Australia, an honours degree is a common entry point to HDR programmes and typically involves undertaking a full-time intercalated research project over 1 year (or equivalent). The applicability of current European reforms in higher education, the Bologna Process (European Commission, 2015), to research training in Australia is currently debated. In response to the Bologna Process, one Australian university has adopted a 2-year hybrid Bachelor of Philosophy and Master of Research degree to replace their honours degree offering (Bishop, 2006; The Group of Eight, 2013).

James Cook University College of Medicine and Dentistry (JCU CMD) is one of a small number of medical schools in Australia to offer an embedded honours in their Bachelor of Medicine, Bachelor of Surgery (MBBS) course. This allows students to undertake a research project as an "overload enrolment" over 2 years, in contrast to the intercalated model, which involves taking a year out from medical studies.

At James Cook University, students with a grade of "credit" or above in the two preceding years may choose to undertake their independent research project (honours project) during the fifth and sixth years of MBBS, or the sixth year of MBBS and the following postgraduate Year 1. Students in Year 5 are on campus, and those in Year

ISSN 1442-1100

6 are at clinical sites. Students are advised to plan their research around their clinical commitments—those who take the postgraduate option are encouraged to complete data collection in the first year and to write up in the second to facilitate supervision from their advisor who may be at a distance. External supervision occurs via regular meetings, in person, or via videoconference, depending on student location.

Students are able to choose their own research area, but this choice depends on the availability of advisors. It is expected that at least one advisor has a PhD and the other may be an experienced clinician. Once enrolled, students undertake an intensive 2-day induction course on research methods, along with recommendations as to online resources. Participation in the honours programme has been shown to significantly increase the chances of future involvement in research (Chopra, Woolley, & Gunnarsson, in press).

Against the background of reform to research training pathways in the higher education sector, evaluation of the current embedded honours programme is appropriate and timely. The experience of students who participate in the embedded honours programme may inform future decisions on research training in medical education. The aim of this study was to describe the embedded honours programme as experienced by students and graduates (scholars) of the programme.

Methods

To gain a broad view of their experiences of the embedded honours programme, purposive sampling of recent honours graduates and Year 5, Year 6 and PGY1 honours candidates was employed. All honours candidates and graduates from the MBBS between 2010 and 2014 were contacted by email. Graduates were emailed once; current students were emailed up to three times, depending upon their response. Recent graduates were more responsive to providing feedback on the programme than current students, so recruitment continued until we had a similar number of participants in each group to allow for evaluation of both the current and the previous programme.

Students were assured that participation was voluntary and would have no impact on their grades, and they were assured confidentiality. All students who were interviewed had completed, or went on to complete, their degrees.

Informed consent was obtained in accordance with ethics approval from James Cook University Human Research Ethics Committee (Registration number H5799).

Semi-structured interviews were conducted by researchers with no direct input into the honours programme (EA and KJ), and data were anonymised prior to discussion with SL and RG, who are both directly involved in the programme. Interviews were conducted in person (1 participant), by Skype, where possible (4 participants), and if not, by telephone (5 participants), since most participants were on student placement or working. The interviews were recorded and transcribed in full. Semi-structured interviews allowed the research team to explore emerging concepts and themes. The interview schedule consisted of questions about accessing the honours programme, motivation for undertaking honours research and experiences of stressors, enablers and sources of support. Ongoing thematic analysis of interview transcripts allowed for emerging themes to be explored in subsequent interviews (Grbich, 1999).

ISSN 1442-1100

Inductive coding of transcripts was an iterative process conducted by two researchers and was facilitated by the qualitative data analysis software NVIVO version 10 (QSR International, 2012). Coding was undertaken independently by EA and KJ, and data were then triangulated, with emerging themes being discussed by all researchers to ensure that consensus was reached and that all themes were identified. A small number of codes required further discussion prior to consensus being reached, mainly on the most appropriate name for the code. Data collection continued until data saturation was reached.

Results

Participants' perspectives on the honours programme

In total, there have been 166 graduates of the MBBS embedded honours programme since the first graduates in 2006; over the last 5 years this equates to 11% of the total MBBS cohort. Numbers have increased each year—49 MBBS Honours students are currently enrolled.

In 2014, six female and four male students were recruited to the study. Participants interviewed had graduated, or were expected to graduate, from the honours programme between 2010 and 2014. Five participants were current honours candidates, and 5 participants were recent MBBS Honours graduates from three different cohorts.

Motivation for undertaking honours research

Participants gave two main reasons for undertaking the MBBS Honours programme: firstly, an interest in research and, secondly, to enhance future career prospects. A genuine interest in research appeared to stem from a desire not only to improve research skills but to contribute to the evidence-base for clinical practice.

> *I guess I see research as a way to enhance my clinical practice, because it helps me understand the research better and research is also a way to try and develop the field, like develop the clinical field with diagnostics and treatments and all that sort of stuff.* (05, male, honours graduate)

For some, an interest in research extended to pursuing a research career. Participants who expressed an interest in pursuing a research career had been involved with research through previous contact with university research groups prior to undertaking honours.

> *I think for me, I'm really interested in doing research and having an academic career. … and certainly at some stage doing my PhD … so it just sort of made sense to do honours. … it's a stepping stone to doing a PhD. … I was already doing … a lot of research beforehand anyway, … so it sort of made sense to just do it.* (04, male, current honours candidate)

The second, and main, driver for undertaking the MBBS Honours programme was to enhance career prospects, with reference to increasingly competitive entry to specialist training pathways and building an impressive curriculum vitae.

ISSN 1442-1100

> *Everything is getting more competitive in terms of specialist training pathways, and research is often a prerequisite or a very good thing to have behind you if you're trying to get on those particular training pathways.* (09, female, current honours candidate)

Participants were also motivated to undertake research at this point in their career because advisors and researchers were available to support them through the process, while less support was perceived to be available at a later career stage.

> *Why not learn how to write a literature review and SPSS and do an ethics application when you have people there whose job it is to help you rather than try and do it on your own.* (09, female, current honours candidate)

Challenges and enablers

The main challenges experienced by students undertaking honours were the amount of work involved, increased stress and lack of existing research skills; enablers identified were peer support and mentorship.

The majority of participants stated they were prepared for the honours programme overload. Some participants, despite feeling prepared, were surprised by the amount of work required.

Participants who felt unprepared for the overload commented that, on reflection, they did not foresee the amount of work associated with the overload or that project planning with their supervisory team was inadequate.

The majority of participants commented that while participating in the honours programme had affected their social commitments negatively, this was seen as an acceptable compromise.

> *Any task that you undertake like that is going to … give you more work to do; it makes you a bit more stressed, and you won't be able to watch as much TV or socialise quite as much but nothing unexpected.* (09, female, current honours candidate)

Reduced social engagements, together with peer support and effective organisational and time management skills were the most commonly described enablers for managing the honours overload successfully.

> *The overload that you go through in fifth year and sixth year can impinge on the time that you have to spend with your friends and exercise and stay healthy and the time that you spend with your partner. So … I'm not saying that it's an unmanageable thing, but it certainly minimises the time that you do have doing those different activities, so you just have to be a little bit more astute with how you manage your time.* (05, male, honours graduate)

Few participants described overly stressful experiences during their honours research. When reported, such experiences were described in association with lack of support from supervisors or the university, or unfamiliarity with the research topic and process.

ISSN 1442-1100

> *I think … there were points when I just sort of felt really, really … under supported and not really knowing what I've been doing and when I did reach out and try get help, I really wasn't met with much.* (06, female, current honours candidate)

Another important challenge identified by participants was a perceived lack of research skills. Previous exposure to research for all participants would have occurred through the medical curriculum in the form of assessed literature reviews, basic epidemiology and academic writing. For most participants, the honours research project was the first major research project with which they had been involved. However, even with the current exposure to research in the curriculum, students expressed a need for further research training.

> *There's no teaching on how to write a systematic review, … and most of their* [other honours candidates] *supervisors haven't written a systematic review either.* (04, male, current honours candidate)

The main needs identified were undertaking systematic reviews, research study design and analysis (including statistics). Lack of familarity with the hospital and university ethics processes was also identified as a barrier, with students commenting on the need for more practical support.

> *Maybe a couple of lectures even on how to go about ethics, how to go about structuring a proper letter …, be it [a] research letter, a cover letter, … how to write … questionnaires … , stuff that's really practical.* (06, female, current honours candidate)

As might be expected, participants with experience in research through paid work or scholarship opportunities, did not report these stressors.

Participants were also questioned on the perceived impact of the honours workload on coursework grades. In terms of coursework performance, some participants expected that their first year of participating in the honours programme (Year 5 of the undergraduate degree) would affect their coursework grade negatively. Two participants who undertook the honours programme in Year 5 (the year of MBBS final examinations) felt that their grades may have been negatively affected, and another participant elected to start in Year 6 to avoid this potential impact. However, the majority of participants felt that the honours programme did not impact on their final coursework grades, and in some cases, the skills learned in research helped enhance their coursework performance.

> *I definitely don't think that it detracted from my coursework, and I think it probably assisted with my coursework. … , with my critical appraisal and current best practice.* (03, male, honours graduate)

Some participants also discussed effects on learning experiences other than coursework experiences. Some students mentioned that they felt they had less time to spend in hospital developing clinical skills, or they identified a missed opportunity in terms of an overseas elective placement foregone.

ISSN 1442-1100

Participants valued the mentorship and support from their peers and past honours graduates highly.

> *I loved it. I think being there and learning alongside my friends was probably the biggest part, and we still, we became the best of friends just by going through that process.* (01, female, honours graduate)

For some participants, isolation from other honours candidates and geographic distance from the college made support networks difficult to form.

Benefits of participating in the honours programme

When describing the benefits of undertaking the honours programme, participants commonly described personal satisfaction, professional development and increased competitiveness for training programmes and employment. Honours graduates affirmed better professional opportunities, while current honours candidates tended to predict that this would the case.

> *One is that it's good to get jobs. If you've got honours and a couple of publications and presentations on your CV, then it's very beneficial for getting into positions in the hospital as a doctor, as a junior doctor and as you guys know, it's getting more competitive to get jobs in hospitals as the number of medical graduates goes up.* (05, male, honours graduate)

Participants often described a sense of accomplishment. Some reported collegiality or a sense of belonging through shared experiences.

> *I feel proud that I could do it and feel accomplished that you can actually do that and that is why it was still the best years of my life. People have asked my about honours before, and that is what I say. It was the worst and best years of my life, but it was totally worth it.* (01, female, honours graduate)

The majority of participants valued the research process, and the research skills gained were seen to be transferable to future undertakings.

> *I think it's helped me more workwise in terms of problem solving, knowing where to get information from in terms of actual things that work.* (10, female, honours graduate)

One participant directly linked expertise in their area of research with positive outcomes in their clinical practice.

> *We had a lady came in that they thought had a communicable infection [name of infection withheld to protect confidentiality] and I was like, I know lots about this. I was able to just rattle my stuff off, and they were all very, … and I considered myself proud that that's an area that I have an interest in and have not a speciality, but increased knowledge in that area.* (01, female, honours graduate)

Relationships established with the supervisory team (many of whom were practising clinicians) formed an important introduction to professional networks for some participants. This was particularly relevant for participants who were passionate about research and wished to embark on a research-focused career.

ISSN 1442-1100

Additionally, the opportunity to disseminate research at conferences and through publications was a valued benefit of undertaking honours research. Conferences were seen to provide opportunities to create professional networks as well as to consolidate presentation and communication skills.

> *It's good because you can put it on your CV, and you get experienced with presenting and making a poster, and you meet lots of people. And meeting people can … establish collaborations, further research … or those people that you meet at conferences can give you jobs in the future in the hospital or research team or in a business or something like that, so there are many, many benefits to it.* (05, male, honours graduate)

Discussion

The findings indicate that the honours programme is perceived by honours students as a pathway towards future research, both within clinical activities and as a career aspiration. Participation was also perceived by current candidates and affirmed by graduates to lead to better employment or training opportunities. With a surge in the number of medical students currently moving through medical schools in Australia, it is important to present a competitive portfolio; indeed, JCU MBBS undergraduate student numbers have increased over the last 5 years, and competition for postgraduate training programmes in Australia is high (Fox & Arnold, 2008).

JCU MBBS Honours students have been very successful in generating peer-reviewed scientific publications. Opportunity and proven ability to publish in renowned peer-reviewed scientific journals in their field are important components and outcomes of the honours programme. Publications are also viewed as an additional contribution to a competitive portfolio, with some students having several publications from their research.

Although they described an increase in workload and some extra stressors, most honours students and graduates managed their honours research successfully. Although study participants had some concerns about the potential influence of an overload enrolment on their MBBS coursework grades, all students completed their coursework successfully, with some study participants reporting that involvement in the honours programme enhanced their coursework grades and clinical practice. Given the additional stresses identified, monitoring and enhanced pastoral care of honours students should be provided by programme coordinators.

A need was identified for additional support in the form of further research training, ethics advice and mentors. Although students did not identify any lack of content knowledge in advisors, advisor unfamiliarity with administrative processes was identified as a problem. This is not surprising as JCU CMD is a relatively new medical school that operates in regional north Queensland, in an area of workforce shortage. In this context, research capacity building is a priority amongst staff and clinicians as well as students. It should be noted that, unlike HDR advisors, honours advisors do not have to undergo advisor training (Kiley et al., 2011). Given the strong tradition of mentoring in academic medicine, strong role models in research

ISSN 1442-1100

are essential to encourage students to pursue a research career. A study undertaken on final-year Australian medical students reported that only 30% of students felt there were positive role models for research, with 93% of students reporting that an academic medical career was not discussed with them (Galletly et al., 2009). Clearly, there is a need to provide more guidance and support to honours advisors and to showcase their research talents.

JCU CMD offers a 6-year undergraduate model, and given the length of the course, many students are reluctant to take a year out for additional research training. In a recent New Zealand study, this reluctance was also identified as a barrier to undertaking intercalated honours, along with the financial and social implications (Park, McGhee, & Sherwin, 2010). To become a clinical researcher, a lengthy training process, starting with the medical course and followed by discipline specialisation and then PhD qualifications, is required. This can discourage many potential students (Brown & Sorrell, 2009). The JCU embedded honours programme offers high-achieving students a competitive advantage, without the added barriers of a lengthened course duration, changing their student cohort and additional financial commitments.

Some of the study participants had made early contact with research teams and were informally involved with research prior to enrolling in the honours programme. Three study students are currently pursuing a Doctor of Philosophy degree (PhD), and they have been awarded scholarships at world-renowned international universities. With several studies showing that early exposure to research can "light the spark" for further interest in research (Chopra et al., in press; Morrison, 2004), medical schools should consider expansion of research within the undergraduate curriculum, along with innovative pathways. The Australian Medical Association stated that medical schools should offer students a range of opportunities to undertake research in electives and in both informal and formal training (AMA, 2013). Internationally, however, outside Australia and Scotland, honours degrees remain a largely misunderstood qualification.

Future research comparing the perceptions of barriers and enablers of the embedded programme with the traditional intercalated MBBS programme or the larger body of James Cook University honours students and honours graduates would be useful to investigate whether students shared similar experiences. A possible limitation of this research is the small number of students at one regional medical school, however the fact that theoretical data saturation was reached suggests that this was sufficient for our aims.

Conclusion

An overload (embedded) pathway remains a viable and successful model in the context of an undergraduate MBBS course and may help to train clinician-researchers who will be able to contribute to solving the health and health system needs of tropical Australia and our region. Students clearly express that it is well worth the extra effort in terms of increased insights and a competitive advantage.

ISSN 1442-1100

References

Australian Medical Association (AMA). (2013). *Clinical academic pathways in medicine—2013*. Retrieved from https://ama.com.au/system/tdf/documents/AMA_position_statement_on_clinical_academic_pathways_in_medicine_2013.pdf?file=1&type=node&id=40606

Bishop, J. (2006). *The Bologna process and Australia: Next steps*. Canberra, ACT, Australia: Department of Education, Science and Training.

Brown, G. V., & Sorrell, T. C. (2009). Building quality in health: The need for clinician researchers. *Medical Journal of Australia*, *190*(11), 627–629.

Carberry, A., & Dumbrell, D. (2012a). *2012 medical students exit questionnaire*. Retrieved from http://www.medicaldeans.org.au/wp-content/uploads/2012-EQ-Report.pdf

Carberry, A., & Dumbrell, D. (2012b). *PGY3 national data report*. Retrieved from http://www.medicaldeans.org.au/wp-content/uploads/2012-PGY3-Report.pdf

Chopra, A., Woolley, T., & Gunnarsson, R. (in press). Barriers and enablers of James Cook University Bachelor of Medicine, Bachelor of Surgery graduates pursuing a research career. *The Australian Journal of Rural Health*.

Dickler, H. B., Fang, D., Heinig, S. J., Johnson, E., & Korn, D. (2007). New physician–investigators receiving National Institutes of Health research project grants: A historical perspective on the "endangered species". *JAMA*, *297*(22), 2496–2501. doi:10.1001/jama.297.22.2496

European Commission. (2015). *The Bologna process and the European higher education area*. Retrieved October 29, 2015, from http://ec.europa.eu/education/policy/higher-education/bologna-process_en.htm

Fox, G. J., & Arnold, S. J. (2008). The rising tide of medical graduates: How will postgraduate training be affected? *Medical Journal of Australia*, *189*(9), 515–518

Galletly, C., Chur-Hansen, A., Air, T., & Chapman, I. (2009). Academics of the future? A survey of final year medical students. *Australasian Psychiatry*, *17*(6), 502–505.

Grbich, C. (1999). *Qualitative research in health*. St. Leonards, Australia: Allen and Unwin.

The Group of Eight. (2013). *The changing PhD: Discussion paper*. Turner, ACT, Australia: Author.

Hauser, S., & McArthur, J. (2006). Saving the clinician-scientist: Report of the ANA long range planning committee. *Annals of Neurology*, *60*(3), 278–285. doi:10.1002/ana.20970

Hayward, C. P., Danoff, D., Kennedy, M., Lee, A. C., Brzezina, S., & Bond, U. (2011, August). Clinician investigator training in Canada: A review. *Clinical and Investigative Medicine*, *34*, 10. Retrieved from http://www.cimonline.ca/index.php/cim/article/view/15360/12380

Hyde, S. (2007). Australian medical students' interest in research as a career. *Focus on Health Professional Education*, *9*(2), 27–38.

ISSN 1442-1100

Kieu, V., Moore, E., Hunter-Smith, D., Spychal, B., & Nestel, D. (2011). How can we improve research opportunities for Australian junior doctors? *ANZ Journal of Surgery*, *81*(12), 852–854. doi:10.1111/j.1445-2197.2011.05895.x

Kiley, M., Boud, D., Manathunga, C., & Cantwell, R. (2011). Honouring the incomparable: Honours in Australian universities. *Higher Education*, *62*(5), 619–633. doi:10.1007/s10734-011-9409-z

Morrison, J. (2004). Academic medicine and intercalated degrees. *Medical Education*, *38*(11), 1128–1129. doi:10.1111/j.1365-2929.2004.01982.x

Myint, P. K., MacLullich, A. M. J., & Witham, M. D. (2006). The role of research training during higher medical education in the promotion of academic medicine in the UK. *Postgraduate Medical Journal*, *82*(973), 767–770. doi:10.1136/pgmj.2006.046227

Park, S. J. K., McGhee, C. N. J., & Sherwin, T. (2010). Medical students' attitudes towards research and a career in research: An Auckland, New Zealand study. *New Zealand Medical Journal*, *123*(1323), 34–42.

QSR International. (2012). *NVivo qualitative data analysis Software (Version 10)*. Doncaster, Victoria, Australia: Author.

Schofield, D. J., Meachem, S., West, C., Kavallaris, M., & Callander, E. J. (2011). A crisis in the making? Education, ageing populations and the future of the medical research workforce. *Medical Education*, *45*(2), 200–207. doi:10.1111/j.1365-2923.2010.03785.x

ISSN 1442-1100