

SHORT REPORT

## Experience of volunteer medical students assisting in the healthcare worker influenza vaccine program at a tertiary hospital during the COVID-19 pandemic

K. Fahey<sup>1</sup>, L. Clucas<sup>2</sup>, S. Elia<sup>3</sup>, W. Uahwatanasakul<sup>1</sup>, A. Cobbledick<sup>4</sup>,  
L. Addlem<sup>3</sup> & N. Crawford<sup>1, 3, 5</sup>

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### Abstract

**Introduction:** For a more rapid rollout of staff influenza vaccination, medical student assistance with a vaccination program was sought during a time when the healthcare workforce was facing unprecedented pressures. This study explored the experience of both the students and supervising nursing staff involved.

**Innovation:** Volunteer medical students were recruited to assist nurse immunisers in a staff influenza vaccination program. The education of medical students involved three components: an online educational session, written and video resources and direct supervision by trained nursing staff.

**Evaluation and outcomes:** Qualitative data was collected from online surveys completed by medical students and structured interviews conducted with students and supervising nursing staff. The interviews underwent thematic analysis. Seventy-four percent (17/23) of medical students completed the survey. Three students and two supervising nurses completed interviews. Ninety-four percent of students strongly agreed they were confident in performing intramuscular injections after participating in the program compared with only 12% prior to participation. The interviews identified that medical students were motivated by gaining clinical experience, feeling useful during the pandemic and an altruistic desire to assist the healthcare workforce. Nursing staff displayed some initial hesitation working with medical students, which was alleviated after their competence was demonstrated.

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<sup>1</sup> Department of Paediatrics, University of Melbourne, Victoria, Australia

<sup>2</sup> Apheresis Service, The Royal Children's Hospital, Parkville, Melbourne, Victoria, Australia

<sup>3</sup> Immunisation Service, The Royal Children's Hospital, Parkville, Melbourne, Victoria, Australia

<sup>4</sup> Pharmacy Department, The Royal Children's Hospital, Parkville, Melbourne, Victoria, Australia

<sup>5</sup> Infection and Immunity, Murdoch Children's Research Institute, Melbourne, Victoria, Australia

### Correspondence

Dr Kieren Fahey  
[kierenfahey@gmail.com](mailto:kierenfahey@gmail.com)

**What's next?** Clinical opportunities that allow medical students to learn or refine skills, whilst also assisting in areas of need, serve a dual purpose in the setting of the pandemic. This program highlights the benefits to students of participating in a staff vaccination program and provides evidence for their involvement in the ongoing rollout of the COVID-19 vaccine in Australia.

**Keywords:** medical student; medical education; pandemic; immunisation; influenza; COVID-19

## Introduction

There have been several competing ideas about the role of medical students during the COVID-19 pandemic, ranging from their exclusion from healthcare work to their active participation in clinical roles (Menon et al., 2020; Miller et al., 2020). Whilst not yet qualified to work as doctors, precedent indicates medical students have a unique skill set and an altruistic desire to volunteer, and they will innovatively adapt to changing healthcare needs in a crisis (Taku et al., 2018).

Medical students are required to learn how to perform intramuscular injections, and an immunisation clinic is an ideal place for this to be taught and practised. In a pandemic setting, clinical opportunities that allow students to simultaneously develop and refine clinical skills and alleviate staffing constraints offer a dual benefit.

The healthcare worker influenza vaccine program at the Royal Children's Hospital (RCH), Melbourne, is run annually by the infection control department. In 2020, due to the COVID-19 pandemic, the program was delegated to the immunisation service, which usually focuses on vaccinating patients and families attending the hospital. Medical students were recruited to assist nurse immunisers in administering the influenza vaccine to staff, allowing junior doctors and nurses to be redirected to the COVID-19 screening clinic and other areas of need. Previous studies have highlighted and described initiatives started by medical students in response to a crisis, but none have explored the experience of students and teachers involved in programs designed with the dual purpose of assistance and education (Heflin et al., 2020; Katz et al., 2002; Klasen et al., 2020).

## Innovation

Medical students from the University of Melbourne (Melbourne, Victoria), a 4-year postgraduate medical school, were recruited on a voluntary basis to assist nurse immunisers in the staff influenza vaccination program in April 2020. Ninety students were approached via email. Once 23 students had responded and were allocated to all available shifts, a subsequent email was sent to indicate no further volunteers were required. A total of 12 nurse immunisers were involved in the program.

There were three elements to the education of medical students volunteering to assist with staff vaccinations. Initially, due to the restrictions on face-to-face meetings at

the time, an online educational session for medical students was held. The session covered logistics and information on influenza vaccines, including safe immunisation practice, contraindications to influenza vaccination, common expected side effects and the management of anaphylaxis. Next, students were provided with further written educational material and video resources detailing the methods and procedure of intramuscular immunisations.

Finally, on arrival at the immunisation area for staff, medical students were oriented to the space and paired with nurse immunisers. Initially, medical students would observe the process of vaccine administration and the assessment of attendees before vaccination. Nursing staff would then allow students to administer vaccines under their supervision. Once nurse immunisers assessed that students administered the influenza vaccine competently and safely, they continued to perform immunisations with minimal supervision.

A total of 23 volunteer medical students assisted with the staff influenza vaccination program in 2020. Up to 10 students were allocated to help four nursing staff daily, for either a morning or an afternoon shift. This assistance to nurse immunisers allowed for a rapid rollout of the staff influenza vaccinations, whereby 2,869 staff members were immunised (58% of staff) in the first week of the program. Additionally, this allowed for more staff to be available to prepare for the unprecedented and rapidly evolving situation during the early stages of the pandemic.

## **Evaluation**

Our aim was to evaluate medical students' motivations and experience of participating in the staff influenza vaccine program at RCH during the COVID-19 pandemic. Our secondary aim was to investigate the impressions of supervising nursing staff to enable a better understanding of their experience working with medical students who contributed to new and evolving roles during the pandemic.

After completion of the program, all participating medical students were approached via email to complete a survey and/or an interview about their experience. Surveys were collected anonymously online via REDCap (Vanderbilt University). Questions focused on the adequacy of the education and supervision, students' motivation for volunteering in the program, and reflection on their experience. Surveys were developed by LC & WU with the aim to assess student experience or confidence levels, and interviews were developed by LC & WU with the assistance of an interview guide.

Three medical students also participated in a semi-structured individual interview via Zoom video platform (Zoom Video Communications, Inc.) to gain further details of their experience. Informed consent was obtained from all participants. Interviews lasted approximately 30 minutes and were conducted by KF, a medical student from the University of Melbourne who was in the same year as two of the participants but had

no personal connection to them. The first three medical students who responded to a recruitment email were selected for the interview. Once three students had responded, a subsequent email was sent to advise that there were sufficient volunteers for the study.

Supervising nursing staff were also approached via email to complete an interview via Zoom, with the first two nursing staff to respond selected. Again, once two staff responded, a subsequent email was sent to indicate there were sufficient volunteers. Eleven questions were asked, focusing on nursing experiences with medical student participation in the program and the experience of the nursing staff providing supervision. Interviews lasted approximately 20 minutes and were conducted by LC, a doctor from RCH.

All interviews were audio-recorded and transcribed verbatim by the researchers undertaking the interviews. Transcriptions were de-identified before undergoing thematic analysis by KF and LC. This study was approved by the Royal Children's Hospital Human Research Ethics Committee (2020-63273-217870).

## **Outcomes**

Seventeen of the 23 medical students (74%) involved completed the survey. Eight (47%) were in their penultimate year and nine (53%) were in their final year. Students completed between one and three sessions administering influenza vaccines.

One adverse event was noted during the program. A needle stick injury occurred during immunisation of a staff member by a medical student. No long-term adverse outcomes were identified secondary to this event.

### ***Medical student survey***

The survey responses are summarised in Table 1. Most students reported the online education to be sufficient, however this was more likely to be the case for final-year (89%) than penultimate-year students (50%). The majority also agreed that the training and supervision on the day was adequate, however only about one third felt the online education was as effective as face-to-face learning for the skill involved.

All students either agreed (35%) or strongly agreed (65%) that the program was a positive learning experience. Additionally, 94% strongly agreed that they were more confident performing intramuscular injections at the completion of their sessions, compared with only 12% prior to participating.

Whilst almost all students reported they were keen to participate, some had a degree of apprehension related to a perceived risk of COVID-19. A minority of students were concerned that they might not have the skills required. Almost all students agreed that participating allowed them to feel they had assisted in the healthcare response to the COVID-19 pandemic, and all were willing to participate in a similar program again.

**Table 1***Medical Student Survey Responses Completed After Participation in Staff Influenza Vaccination Program*

	<b>Strongly disagree</b>	<b>Disagree</b>	<b>Neither agree nor disagree</b>	<b>Agree</b>	<b>Strongly agree</b>
<b>Education</b>					
The online education provided:					
• was sufficient	0	6% (1)	24% (4)	35% (6)	35% (6)
• was as effective as face-to-face learning.	12% (2)	35% (6)	24% (4)	18% (3)	12% (2)
I received adequate training and supervision on the day.	0	0	6% (1)	35% (6)	53% (9)
<b>Experience</b>					
I was confident performing intramuscular injections:					
• before participating	0	29% (5)	18% (3)	41% (7)	12% (2)
• after participating.	0	0	0	6% (1)	94% (16)
It was a positive/useful learning experience.	0	0	0	35% (6)	65% (11)
<b>Motivation and role in pandemic</b>					
I was immediately keen to participate.	6% (1)	0	0	29% (5)	65% (11)
I was apprehensive about participating:					
• because of the risk of COVID-19	24% (4)	41% (7)	12% (2)	24% (4)	0
• because I was not sure I had the skills required	12% (2)	71% (12)	6% (1)	12% (2)	0
• due to another reason.	29% (5)	29% (5)	35% (6)	0	0
Participating allowed me to feel I had assisted in the healthcare response to COVID-19.	0	0	6% (1)	53% (9)	41% (7)
I would participate in a similar program again:					
• in the setting of a pandemic	0	0	0	47% (8)	47% (8)
• outside of a pandemic setting.	0	0	6% (1)	24% (4)	71% (12)

***Medical student interviews***

Interview responses are summarised in Table 2. Whilst participants indicated that online learning was considered less effective than face-to-face, they highlighted that it was adequate in this setting, given that they had some previous experience giving intramuscular injections. The instructional video was identified as a particularly effective part of the education, as well as combining the online learning with direct observation

and supervision on the first day of the program. Students felt the program improved their confidence giving intramuscular injections and their ability to communicate with patients.

**Table 2**

*Medical Student Interview Responses*

Theme	Responses
Motivation for participation	"An opportunity to do some clinical things" (Student 2).
	"I wanted to refine my skills" (Student 1).
	"An opportunity to ... alleviate some of the more skilled staff to do more skilled things" (Student 2).
	"Feeling accomplished and competent in helping out" (Student 3).
	"I personally do think that I have a responsibility or obligation [to assist]" (Student 1).
Online education	"Face-to-face teaching is always easier" (Student 2).
	"[Online education] was effective enough for ... what needed to be delivered" (Student 2).
	"I had given vaccinations to patients beforehand so online was a quite convenient and quick review for me" (Student 3).
	"After watching a nurse do it, I felt okay in doing it on my own" (Student 1).
Benefits of the program	"Definitely a lot more confident in giving intramuscular injections" (Student 1).
	The repetition definitely helped and now I'm not so scared of giving [intramuscular injections]' (Student 1).
	"[I enjoyed] improving my own ability to ... interact with patients" (Student 3).
	"[I improved my] communication skills" (Student 3).
Concerns around participation	"I live with my family at home, and I am mindful of potentially bringing something into the house that could put them at harm" (Student 1).

Student 1: 3rd-year medical student who completed two vaccination shifts

Students 2 and 3: 4th-year medical students who completed two vaccination shifts

Motivation to volunteer centred around three key themes: 1) students described a personal desire to obtain more clinical experience during a time when they had been removed from clinical placements; 2) students highlighted that the program provided them with a sense of purpose and an opportunity to feel useful during the pandemic; and 3) some students highlighted an altruistic desire to help in the response to the pandemic, whilst others indicated they were more motivated by a sense of obligation to assist the healthcare workforce. Overall, students agreed that there was opportunity for medical students to assist healthcare workers by performing tasks appropriate to their level of experience.

### ***Nursing staff interviews***

Two of the supervising nursing staff took part in interviews following the influenza vaccination program. One of the nurse immunisers described some initial reservations about medical students participating, with concerns about their skill level and abilities. Whilst both nurses had worked with medical students in the past, this had not been in a direct supervision role. Both nurses found it a positive experience and would recommend a similar program to other health services both during the pandemic and outside of a pandemic setting. The nurses spoke of the benefits to medical students of developing both their skills in intramuscular injections and professional communication skills. Strengthening interprofessional relationships between nurses and medical students was another benefit highlighted by nursing staff.

Our initiative demonstrated that the medical students who participated in our study were highly motivated to assist the healthcare workforce during a pandemic and that their involvement was also beneficial to their own medical education. Online education can be a useful learning supplement for teaching students clinical skills, although participants considered it inferior to face-to-face teaching. Students who volunteered were in strong agreement that their confidence in performing intramuscular injections was significantly improved.

Nursing staff found the program was a mutually beneficial experience, with medical students demonstrating that they were competent and able to assist the healthcare workforce. Development of interprofessional relationships between nurses and medical students, through actively working together in this program, was also seen as a positive outcome.

On further investigation of the needlestick injury that occurred, it is likely that this resulted from the hand hygiene process. Whilst medical students had performed separate hand hygiene modules, this incident identified a gap in our education of students and highlighted the importance of not assuming knowledge, particularly when working with healthcare students who are less experienced and may receive minimal direct supervision.

### **What next?**

The lessons learnt from medical students delivering the staff influenza vaccine in 2020 highlight the benefit of their involvement in the ongoing roll out of COVID-19 vaccinations during the pandemic and beyond. Clinical opportunities that allow students to learn or refine their skills, whilst also helping in areas of need, serve a dual purpose in the setting of a pandemic.

Education of students for participation in such roles must be carefully designed to ensure they are well prepared and have adequate supervision. Similar programs may also have a role in providing medical students with procedural experience they may have missed due to cancelled clinical placements during the pandemic.

Moving forward, formalising programs such as this into medical education curricula could be considered by medical schools as a way of providing practical skills to students, integrating them into the hospital system and assisting the healthcare workforce. Care would need to be taken in designing these programs, ensuring that a careful balance is found between the ongoing educational needs of students and their benefit to healthcare services. These considerations will ultimately lie with the medical schools, who have a duty of care to their students to provide a safe working environment.

Due to our small sample size, results may not be representative of the collective attitude of medical students towards volunteering. Additionally, there is an inherent self-selection bias associated with those willing to volunteer for participation in the program, in the first instance, and who subsequently respond to surveys and interviews.

Future studies should examine the optimal time for students to be engaged in these programs and what other skills are considered beneficial to learn by medical students. Ideally, programs will provide a continual educational benefit and assist in clinical workflow. A rotation-based system with similar programs could be initiated to allow for ongoing learning and clinical skill improvement.

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## Conflicts of interest and funding

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