



Original Article

Developing strategies to increase the immunity of medical students at an Australian University



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ABSTRACT

Background: Immunity to many vaccine-preventable diseases is inadequate amongst medical student populations internationally.

Objectives: To identify the factors that influence vaccination behaviour of Australian medical students and to identify appropriate immunisation-promotion interventions for this population.

Methods: A qualitative study using grounded theory techniques was undertaken in August and September 2014. Eighteen medical students from James Cook University in Townsville, Queensland, Australia participated in one of three focus group interviews. Data analysis incorporated the principles of the constant comparative method.

Results: Four themes emerged to explain the determinants of immunisation in this population: protection from infectious disease, understanding of the consequences of infectious disease, influence of individual and institutional recommendations, and practical barriers. Strategies to improve immunity were explored in three themes: empowering and educating students, improving access and mandating immunisation.

Conclusions: The determinants of medical student immunisation are complex and interconnected. A multi-faceted, long-term approach is needed to improve medical student immunity, and should include implementation of vaccination clinics and awareness initiatives, with future consideration of mandatory vaccination and integration into clinical skills programs and sessions. Immunisation policies and duty of care arrangements need clarification.

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1. Introduction

Achieving meaningful increases in the immunity of a population requires an understanding of the factors that influence their health-seeking behaviour. Psychological theories of preventative health behaviour have described the situational and individual factors that are generally associated with immunisation compliance [1]. Medical students are a unique population, as the interplay between the factors that sway their vaccine uptake is likely to be more complicated than in other groups. Despite strong recommendations by leading public health advisory bodies, medical students consistently have poor immunity to vaccine-preventable diseases [2–4]. Previous authors have found that the most significant determinants of vaccine uptake among medical students internationally relate to knowledge, professionalism, risk perception and vaccine cost [5]. There are few published examples of interventions aimed

at improving medical student immunity, however several groups have had some success with mandating medical student immunity [6–8].

A survey demonstrated that medical students in North Queensland have sub-optimal immunity to important vaccine preventable-diseases, except for the mandatory hepatitis B vaccine [5]. Subsequently, this qualitative study was undertaken to investigate the factors that influence immunisation-behaviours among medical students in North Queensland. Another purpose was to identify appropriate strategies and interventions to improve the immunity of this population. To the author's knowledge, there is no published literature on these issues that specifically pertains to an Australian medical student population. The findings from this research will be used to develop specific recommendations for health service and education providers, to enable them to act to manage the serious risks posed by occupational communicable diseases.

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2. Methods

2.1. Population

Medical students at James Cook University, Queensland, Australia are enrolled in a six-year undergraduate degree. Clinical exposure commences in first year and increases proportionally with progress through the course. Students in years one, two and three are considered “pre-clinical”, receiving most of their education (including patient interaction) within the university environment. Year four, five and six students are in their “clinical” years of medical school, with the majority of their teaching taking place in hospitals.

Occupational vaccination recommendations in Australia state that healthcare workers and students should ensure immunity to hepatitis B, seasonal influenza, measles, mumps, rubella, pertussis, and varicella. Additionally, those who work in remote Indigenous communities or with Indigenous children should be vaccinated against hepatitis A [9]. Adherence to these recommendations is mandated variably across Australian state, territory and private healthcare services. All students in the public healthcare system in the Australian state of Queensland must be immune to hepatitis B; the remainder of the immunisation schedule is recommended to students in North Queensland but not mandatorily enforced [10,11]. Medical students are financially responsible for their immunisation-related expenses. They are sometimes included in state staff vaccination initiatives, but not in all facilities.

Students had previously participated in an online survey which indicated sub-optimal levels of immunity to vaccine-preventable diseases. Proof of immunity was based on disease-specific recommendations from the Centres for Disease Control and Prevention [5]. At the completion of the survey, students were asked to submit their contact details if they were interested in participating in further research. Forty-four students registered their interest; all were emailed information on the purpose of the focus groups and invited to attend. Participants were then selected based on their response to this invitation and their availability to attend interviews at specific pre-arranged times. This study was approved by the Human Research Ethics Committee at James Cook University (approval number H5664).

2.2. Focus group interviews

Three focus group interviews were held with eighteen James Cook University medical students in Townsville, during August and September 2014. The de-identified composition of the focus groups is presented in Table 1. The separation of the students into two separate year level groups and one mixed group was purposive, designed to maximise discussion but also to reduce any inherent intimidation by senior students. Each focus group interview lasted approximately one hour, and took place at a

Table 1
Composition of focus group interviews.

Focus group 1 Pre-clinical students only	5 medical student participants <ul style="list-style-type: none"> • 3 first year students (2 male, 1 female) • 2 third year students (1 male, 1 female)
Focus group 2 Pre-clinical and clinical students	9 medical student participants <ul style="list-style-type: none"> • 3 second year students (2 male, 1 female) • 4 third year students (1 male, 3 female) • 1 fourth year student (female) • 1 sixth year student (male)
Focus group 3 Clinical students only	4 medical student participants <ul style="list-style-type: none"> • 1 fourth year student (female) • 2 fifth year students (1 male, 1 female) • 1 sixth year student (female)

convenient time that did not impact on student academic commitments. Lunch was provided.

Two moderators conducted each focus group interview (EF and an experienced qualitative researcher with a neutral relationship to the students). The interviews focused on student responses to the following prompt and questions: “Medical students have low levels of immunity to many diseases. What are the factors that influence your decision to get vaccinated?” and, in the latter half of the interviews, “If you had to come up with a program or strategy to increase medical student immunity, what would you do?” The moderators followed up responses with open-ended questions to understand the reasoning behind vaccination behaviours, pursued themes as they occurred, and sought clarification when required. An interview guide was used to prevent discussion from deviating too widely (this was developed through examination of existing literature on healthcare student vaccination behaviour) [5]. The content of the second and third focus group interviews was expanded to pursue and clarify themes that emerged in previous interviews, particularly to explore the strategies suggested by students’ to improve immunity [12–14].

2.3. Data analysis

Activities within the focus groups were audio-recorded, transcribed verbatim by one researcher (EF) and checked for accuracy by the second moderator. The interviews were conducted over a two-week period, with the moderators keeping extensive interview- and conceptual-based memos throughout. Data collection and analysis took place simultaneously and with identification that data saturation was achieved during the third interview, no further focus group participants were sought. Coding systems were developed by one researcher (EF) using these memos, with advice and clarification from the other authors (RS, CH) as required [12–14]. Member checking increased the validity of this study – medical student participants were emailed de-identified transcripts and the preliminary conceptual framework. Three participants responded to clarify and elaborate on their contribution to the focus group discussions, and these responses were incorporated into the data [15].

3. Results

The main explanatory themes that emerged from this study are summarised in Tables 2 and 3. These themes are discussed in detail in the following paragraphs.

Table 2
Coding framework: determinants of medical student immunisation behaviour.

Theme	Description
Protection from infectious disease	Medical students are motivated to protect themselves and their patients from vaccine-preventable diseases
Understanding the consequences of infectious disease	Medical students who understand the seriousness of vaccine-preventable diseases are more motivated to ensure their immunity. Their understanding can come from personal experiences or clinical knowledge
Influence of individual and institutional recommendations	Influential doctors and lecturers can positively influence medical student vaccination-behaviour. Similarly, lack of discussion and the absence of official recommendations leads to student apathy about their own immunity
Practical barriers	Medical students are discouraged by the cost and inconvenience of getting vaccinated

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