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ATTITUDES, INTENTIONS AND READINESS TOWARDS COVID-19 VACCINES: A SURVEY OF STAFF AND STUDENTS WITHIN A NEW ZEALAND VOCATIONAL TERTIARY INSTITUTE

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ATTITUDES, INTENTIONS AND READINESS TOWARDS COVID-19 VACCINES: A SURVEY OF STAFF AND STUDENTS WITHIN A NEW ZEALAND VOCATIONAL TERTIARY INSTITUTE

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INTRODUCTION

The COVID-19 pandemic is a highly contagious virus where the death toll continues to rise, and demographers are struggling to provide data on the official death toll (Adam, 2022). Vaccination has significantly reduced the global infectious disease burden, the mortality rate (Andre et al., 2008) and improved health outcomes globally (Rodrigues & Plotkin, 2020). Despite the high level of vaccination safety (Rosenblum et al., 2022), attempts to increase vaccination coverage remain a challenge and frustrate public health efforts across higher-income countries and developing economies.

Vaccine hesitancy is a complex phenomenon and an emerging area of inquiry (WHO SAGE Working Group, 2014a). Despite the availability and accessibility of vaccine services, those who are vaccine hesitant delay or refuse to accept a vaccine (MacDonald, 2015; WHO SAGE Working Group, 2014b). Perceptions inform the level of confidence or trust in the safety and efficacy of a vaccine, complacency about possible risks posed by vaccine-preventable diseases and perceived convenience factors such as accessibility and service delivery (MacDonald, 2015). Vaccine hesitancy can vary amongst individuals and groups, across time, location, and vaccine type (WHO SAGE Working Group, 2014b). Vaccine hesitancy or reluctance (Swaney & Burns, 2019) contributes to lower vaccination rates among children (World Health Organisation, 2021) and adults (Perkins et al., 2015) and presents a risk for infection outbreaks. Effective community protection from infectious disease (herd immunity) requires approximately 70% of the world's population to be fully vaccinated (World Health Organisation, 2021).

As the pandemic and vaccine rollout unfolds internationally, vaccine hesitancy in New Zealand was reported by the Ministry of Health (MoH) Horizon Surveys over seven months from mid-2020 as a vaccine acceptance rate of 69% (Horizon Research, 2021a). New Zealand's vaccine acceptance rates are similar to Australia and the United States (67-75%), lower than some Asian nations with rates approaching 90%, but higher than most European nations with 50%-60% (Malik, 2021). The MoH also found that the percentage of the population who will *definitely not* take a vaccine is predicted to remain unchanged at about 9.4% (Horizon Research, 2021b). However, the percentage of people who were *unsure* or *unlikely* to take a vaccine indicated a slight increase in vaccine hesitancy with greater need for assurances about vaccine safety over the survey period (Horizon Research, 2021b), a pattern repeated in multiple surveys undertaken as part of a large European Covid-19 vaccine hesitancy study (Valckx et al., 2022). Similarly, Thaker commented, "Increasing public enthusiasm for vaccination should co-occur with the development of a COVID-19 vaccine" (Thaker, 2021, p. 6) suggesting the situation is dynamic, and further research may find additional shifts. In addition, research focusing on subsets of the general population can assist with public education that may need to be adjusted to different groups or cohorts.

The current research presented in this paper aims to investigate staff and students' attitudes, intentions, and readiness at a New Zealand vocational education institute of technology toward COVID-19 vaccination. The intention is to supplement current findings from general New Zealand population surveys with up-to-date data on the attitudes, intentions and readiness of staff and students working or studying in the tertiary vocational section in the Bay of Plenty and Waikato, New Zealand. It is anticipated that this will allow a more granular understanding of attitudes, intentions and readiness regarding COVID-19 vaccination while vaccination is underway. At the time of writing, both Lakes and Bay of Plenty District Health Boards (DHB) in New Zealand have embarked on a vaccination rollout. Vocational institutes within New Zealand have campuses spread across regions where large numbers of people consistently come to study and work. This study focused on staff and students' attitudes, intentions, and readiness, therefore providing evidence to vocational health centres on campus that this service is a viable option. Understanding vocational staff and students' willingness to be vaccinated is essential due to the New Zealand government investigating the setting of vaccination centres within schools and workplaces. Unlike universities in New Zealand, vocational education has campuses within smaller towns and rural areas, in most cases creating a focal point for that community. Approximately 240,000 students are involved in vocational education annually, supported by around 12,000 staff, now under the merged Te Pūkenga entity.

METHODS

This descriptive, cross-sectional study used a quantitative research design implementing an online survey. The survey was created using *Google forms* and was designed to investigate student and staff attitudes, intentions and readiness regarding COVID-19 vaccination. The survey was adapted (with permission) from a previously validated survey from Horizon Research Limited that examined COVID-19 vaccines (Horizon Research, 2020). The survey was available for current Toi Ohomai Institute of Technology Ltd. staff and students over three weeks during June 2021.

Inclusion criteria was the current staff and enrolled students from all five Toi Ohomai campuses (i.e., Rotorua, Tauranga, Taupō, Tokoroa and Whakatāne) in the North Island of New Zealand. Approximately 900 staff and 7000 students were eligible to participate. An invitation to participate in the survey was distributed via the internal staff intranet (Te Aka). All currently enrolled students were emailed an invitation through email (via the Marketing and Communication Team in the capacity as gatekeeper) addresses provided on enrolment. Participant information was gathered before starting the survey and written online informed consent was required. To incentivise participation, survey completers were entered into a prize draw for vouchers. Ethical approval was obtained from the Toi Ohomai Research Office (Ethics research number: TRC 2021.057).

The online survey consisted of two sections with a total of 27 questions. The first section collected participant demographic data, and the second section gathered participant attitudes, intentions and readiness regarding COVID-19 vaccination. Demographic data included gender, age, ethnicity, household income, personal income, employment status, learner type, highest qualification, and dwelling location. Participant intention questions regarding COVID-19 vaccinations included statements regarding beliefs, confidence in vaccine standards, and prevention of infection or transmission. Participants responded according to what they felt was correct or the level of confidence in the vaccine using a 5 or 7-point Likert scale.

STATISTICAL ANALYSIS

Descriptive statistics were used for demographic data, including median, range and interquartile ranges (IQR). For questions with Likert-scale responses, differences in responses for variables with multiple factor levels (e.g. educational level, ethnicity, dwelling location and influenza vaccine intention) were tested using the Kruskal-Wallis test with post-hoc analysis using the Dunn Test (Dinno, 2015) and the Benjamini-Hochberg method for adjusting *p*-values for multiple comparisons (Benjamini & Hochberg, 1995). These results are reported as H

(degrees of freedom) and *p*-value. For variables with two factors levels (e.g. vocational position), differences between groups were tested using the Mann-Whitney U test, with results reported in the form U (degrees of freedom), *z*-value, *p*-value. For this analysis, staff who were also students were classified and grouped as staff. The correlation between age and degree of confidence was tested using Kendall's tau. All statistics were analysed using R version 4.1.0 (R Core Team, 2021). Graphs showing the difference in response across groups were plotted using the Likert package (Bryer & Speerschneider, 2016).

RESULTS

Demographics

There were 609 survey responses, with a response rate of approximately 12.9%. Median age of respondents was 31 years (range=17-76; IQR=20; see Figure 1a). Most participants identified themselves as NZ European/Pakeha (59.3%) or Māori (30.7%); see Figure 1b. Other respondent characteristics are given in Table 1.

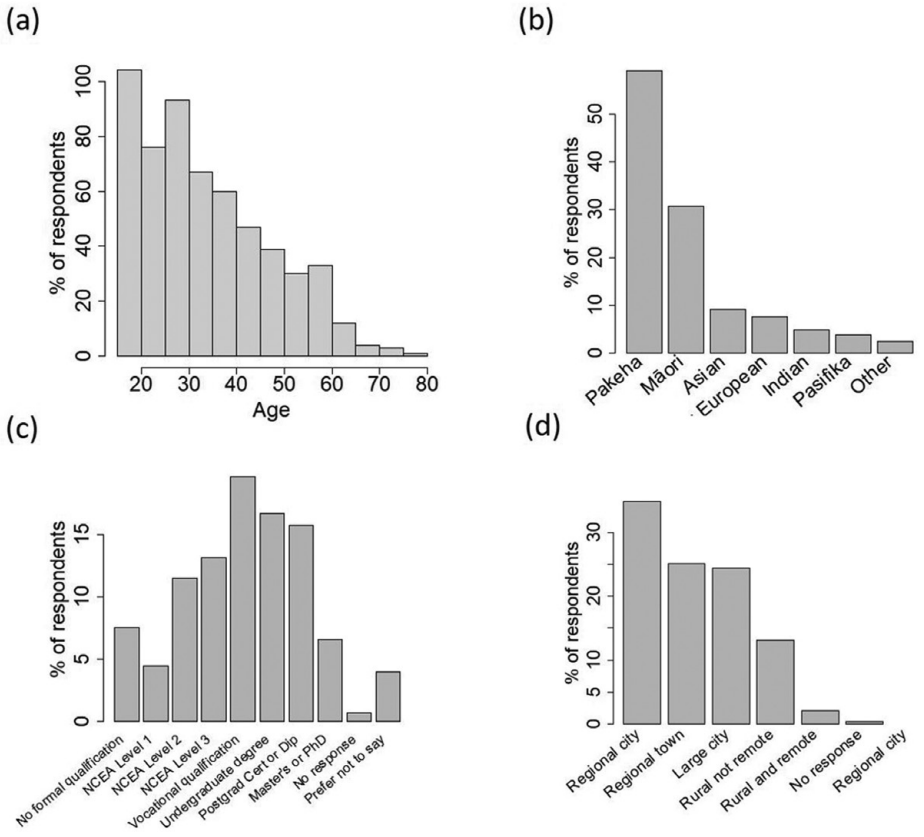


Figure 1. Respondent demographics: (a) Age (b) Ethnicity (c) Highest educational level attained (d) Dwelling location.

Respondent characteristics	n	%
Gender		
Female	412	67.7
Male	192	31.5
Not stated	4	0.7
Gender diverse	1	0.2
Vocational position		
Student	570	93.6
Staff	19	3.1
Student & staff	16	2.6
Not stated	4	0.7
Employment status		
Employed	363	59.6
Not employed	212	34.8
Prefer not to say	25	4.1
Not stated	9	1.5
Annual household income		
<$20,000	75	35.0
$20,001 - $30,000	52	8.5
$30,001 - $50,000	72	11.8
$50,001 - $70,000	77	12.6
$70,001 - $100,000	80	13.1
$100,001 - $150,000	66	10.8
$150,001 - $200,000	36	5.9
>$200,000	16	2.6
Not stated	135	22.2

Table 1. Respondent characteristics: gender, vocational position, employment status, annual household income.

Responses to vaccine questions/statements

Table 2 shows the responses to statements about vaccines that were true (2a), false (2b) or intended to gauge opinion (2c).

2(a) The percentage of respondents who agreed with the following true vaccine statements.

TRUE STATEMENTS	% of respondents agreeing with statement
People in New Zealand can choose whether or not to get vaccinated.	87.5
The COVID-19 vaccines are offered free in New Zealand.	85.4
Anyone who has had a severe or immediate allergic response to any vaccine or injection in the past should discuss this with their vaccinator.	84.4
Vaccines are rolled out to people in New Zealand using a risk-based approach –people at the greatest risk from COVID-19 can get vaccinated early.	84.1
Once I have had the Pfizer/BioNTech COVID-19 vaccine, I will need to continue with physical distancing, QR code scanning and mask wearing on public transport.	79
COVID-19 vaccines will play a critical role in protecting New Zealanders' health and well-being.	77.5
People who have been vaccinated can still catch COVID-19.	67.8
Over time, COVID-19 vaccines will allow a return to normality.	67.7
The Pfizer/BioNTech vaccine may cause side effects in some people but they are common, mostly mild and won't last long.	65.7
It is too soon to see if there are any long-term side-effects from the Pfizer/BioNTechvaccine.	64.2
People who are vaccinated can still pass the COVID-19 virus on to others.	56.7
At the moment, COVID-19 vaccines will be offered only to people in New Zealand if they are 16 years of age or older.	53.4
The Pfizer/BioNTech vaccine has been shown to be 95% effective.	51.4
People are having serious reactions after taking the Pfizer/BioNTech vaccine.	21.2
People are dying after taking the Pfizer/BioNTech vaccine.	12
	100

(b) The percentage of respondents who agreed with the following false vaccine statements.

FALSE STATEMENTS	% of respondents agreeing with statement
Those who are pregnant, breastfeeding or think they may be pregnant should talk to their doctor or midwife before having a COVID-19 vaccine.	84.7
I won't be able to pass COVID-19 on to others.	10.7
I won't need to continue with protective behaviours (physical distancing, QR code scanning and mask-wearing on public transport).	9.5
The COVID-19 vaccine can alter your DNA.	6.6
I will only need one, not two doses of the Pfizer/BioNTech vaccine, to be fully protected.	4.1
The COVID-19 vaccines contain a microchip.	3.6
	100

(c) The percentage of respondents who agreed with the following opinion-based vaccine statements.

STATEMENTS OF OPINION	% of respondents agreeing with statement
It is too soon to see whether there are any long-term effects from the vaccine.	52.1
I worry there will be unknown side effects.	40.2
I worry how the side effects will affect me.	39.2
Once I have had the Pfizer/BioNTech COVID-19 vaccine, I'm really not sure if I will need to continue physical distancing.	32.2
I worry it might affect my health in other ways.	30
I would rather wait to see if it causes any problems for others.	27.9
I don't know enough about vaccines.	26.3
COVID-19 vaccine development was too rushed.	25.9
Once I have had the Pfizer/BioNTech COVID-19 vaccine, I will still be physical distancing but I'm really not sure if I can pass it on to others.	21.8
I am concerned the vaccine may not be effective.	21.3
The idea of taking the COVID-19 vaccine frightens me.	16.4
I don't know how a COVID-19 vaccine works.	15.9
Taking the COVID-19 vaccine may leave my health overall worse.	14
The COVID-19 vaccine might adversely affect my existing medical conditions andsymptoms.	11.7
I don't see any need for me to take the COVID-19 vaccine.	10
I have had adverse reactions to other vaccines and I am worried.	4.4
I worry a COVID-19 vaccine might give me COVID-19.	4.3
Other concerns	4.3
	100

Effect of age on responses

Increased vaccine hesitancy was found among younger respondents. In response to the question *"Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will meet acceptable safety and quality standards?"* the degree of confidence positively correlates with age (r_τ = 0.12, p=0.0003). In the 55+ age group, 80% of respondents were *confident* or *very confident,* compared with only 55% in the 22-25 age group. The proportion of respondents who were unsure about safety and quality standards was higher in the under 35s than those in the older age group (see Figure 2a).

Likewise, in response to the question *"Will you take the Pfizer/BioNTech COVID-19 vaccine?",* the positivity of response correlated with age (r_τ = 0.12, p=0.00007), with 90% of the 55+ age group responding positively, 78% for the 35-54 age group and <70% for the younger age groups (see Figure 2b).

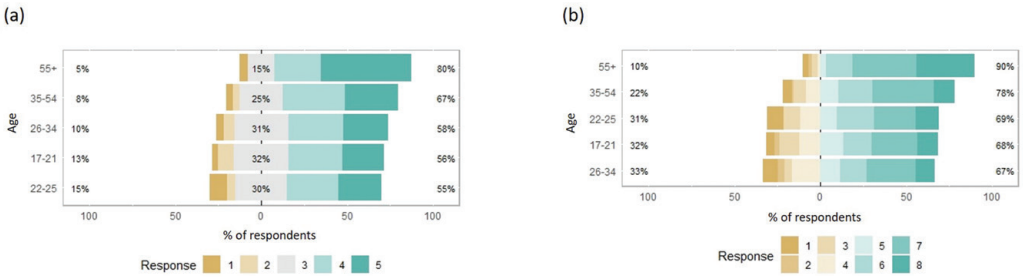


Figure 2. Response to vaccine confidence questions for different age groups.

(a) Responses to the question, "*Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will meet acceptable safety and quality standards?*"; 1=Not confident at all, 2=Not very confident, 3=I'm really not sure, 4=Confident, 5=Very confident.

(b) Responses to the question, "*Will you take the Pfizer/BioNTech COVID-19 vaccine?*"; 1=Definitely not, 2=Most unlikely, 3=Unlikely, 4=Unsure, 5=Likely, 6=Most likely, 7=Definitely, 8=Already vaccinated.

Percentages displayed on the left of the graph indicate % of negative responses, those on the right indicate % of positive responses, and those in the centre indicate neutral responses, if applicable.

Responses of staff versus students

Staff indicated greater intention to get vaccinated (89%) compared with students (73%), but this difference was not statistically significant ($U_{(35,567)}$=11150, z=1.26, p=0.2).

Effect of educational level on responses

There were small but significant differences in responses about vaccine confidence across different educational levels. Generally, vaccine confidence tended to be higher in respondents with undergraduate and postgraduate degrees (see Figure 3). Response differences across educational levels were significant for the question relating to confidence about vaccine safety and quality (H(8)=15.7, p=0.05; Figure 3a), infection prevention (H(8)=21.8, p=0.005; Figure 3b) and transmission prevention (H(8)=25.0, p=0.002; Figure 3c). In addition, there was a significant difference across educational levels in the stated likelihood of respondents getting vaccinated (H(8)=39.1, p<0.0001; Figure 3d), with 92% of master's and PhD students stating they would get vaccinated, compared with 74% of those at NCEA Level 1 and 65% of those with no formal qualification.

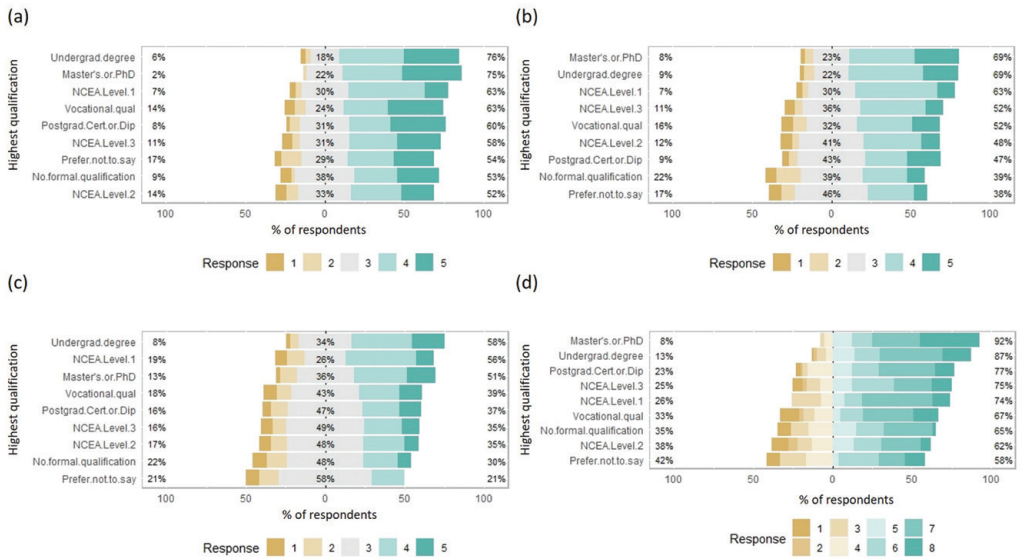


Figure 3. Response to vaccine confidence questions for different educational levels.

(a) Responses to the question, *"Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will meet acceptable safety and quality standards?"* (b) Responses to the question, *"Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will prevent COVID-19 infection?"* (c) Responses to the question, *"Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will prevent you passing infection to others?"* (d) Responses to the question, *"Will you take the Pfizer/BioNTech COVID-19 vaccine?"*

For (a-c) 1=Not confident at all, 2=Not very confident, 3=I'm really not sure, 4=Confident, 5=Very confident. For (d) 1=Definitely not, 2=Most unlikely, 3=Unlikely, 4=Unsure, 5=Likely, 6=Most likely, 7=Definitely, 8=Already vaccinated.

Percentages displayed on the left of the graph indicate % of negative responses, those on the right indicate % of positive responses, and those in the centre indicate neutral responses, if applicable.

Effect of ethnicity on responses

Differences in vaccine confidence and intention to vaccinate were observed between different ethnicities. In response to the vaccine safety and quality question, significant differences in confidence occurred between ethnicities ($H(6)=37.7$, $p<0.0001$; Figure 4a). Māori had the highest proportion of negative or neutral responses, whereas Indian and 'other' had the lowest proportion of negative or neutral responses (21% and 7%, respectively). A similar pattern was observed for the infection prevention question ($H(6)=38.2$, $p<0.0001$; Figure 4b), and transmission prevention question ($H(6)=28.7$, $p<0.0001$; Figure 4c), with Māori showing the lowest proportion of positive responses to both questions. Vaccine uncertainty (proportion of *"I'm really not sure"* responses) was higher for the question of vaccine transmission compared with the safety and infection prevention questions, and this was consistent across all ethnicities. Intention to take the vaccine varied between ethnicities ($H(6)=33.3$, $p<0.001$; Figure 4d). Māori was least likely to take the vaccine, with 40% of responses negative or neutral. All other groups had at least 75% positive responses, with the most positively responding groups being 'other' (93%) and Indian (89%).

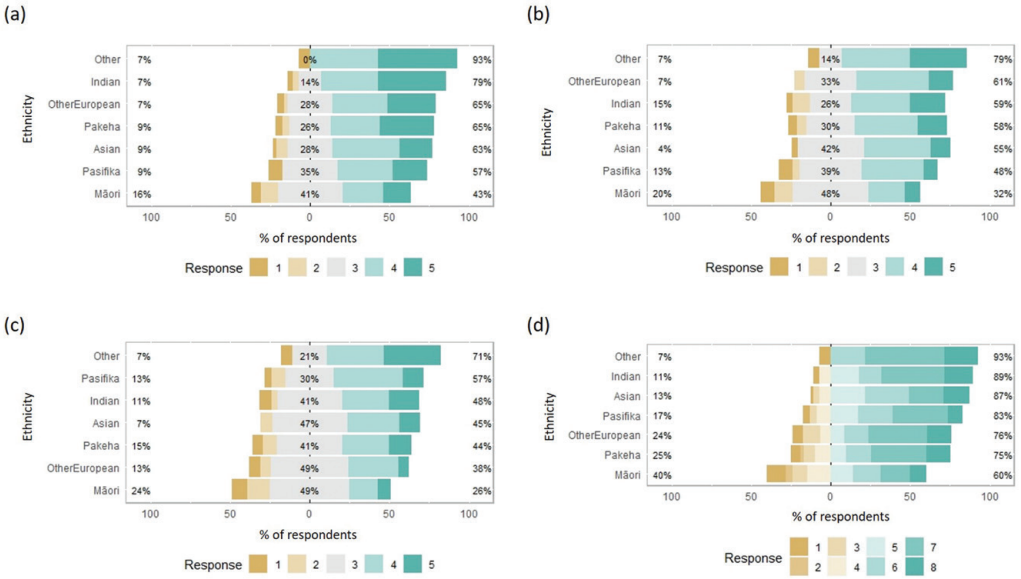


Figure 4. Response to vaccine confidence questions for different ethnicities.

(a) Responses to the question, *"Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will meet acceptable safety and quality standards?"* (b) Responses to the question, *"Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will prevent COVID-19 infection?"* (c) Responses to the question, *"Overall, how confident are you that any COVID-19 vaccine to be used in New Zealand will prevent you passing infection to others?"* (d) Responses to the question, *"Will you take the Pfizer/BioNTech COVID-19 vaccine?"*

For (a-c) 1=Not confident at all, 2=Not very confident, 3=I'm really not sure, 4=Confident, 5=Very confident. For (d) 1=Definitely not, 2=Most unlikely, 3=Unlikely, 4=Unsure, 5=Likely, 6=Most likely, 7=Definitely, 8=Already vaccinated.

Percentages displayed on the left of the graph indicate % of negative responses, those on the right indicate % of positive responses, and those in the centre indicate neutral responses, if applicable.

Effect of dwelling location on vaccine confidence and access

The dwelling location of respondents (large city, regional city, regional town, rural not remote, rural and remote) had no effect on responses to vaccine confidence or likelihood of getting vaccinated.

The five most common access methods were similar across dwelling locations (e.g. my doctor, practice nurse, medical specialist, pharmacy and hospital). However, access providers such as churches, the marae, Māori health providers, local schools, and pop-up services on campus, were used by a higher proportion of respondents in remote rural locations than other locations.

Comparison with influenza vaccine intention

There was a strong association between respondents' intention to receive the influenza vaccine and intention to receive the COVID-19 vaccine ($H(2)=109.7$, $p<0.0001$; Figure 5). Of respondents who had received or planned to receive a flu vaccine, 93% responded positively about their intentions to get a COVID-19 vaccine. Conversely, only

57% intended to or had already received a COVID vaccine for respondents who did not plan to get a flu vaccine.

In response to the question, *"Did you have or are you going to have a vaccination for influenza this year?"* 71% of staff responded with 'yes' or 'maybe' compared with 55% of students.

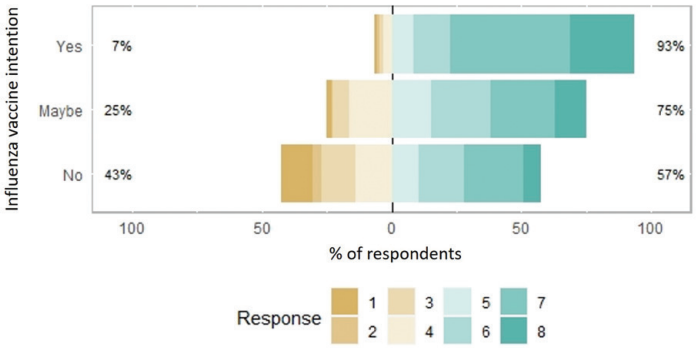


Figure 5. Relationship between COVID-19 and influenza vaccination intention.

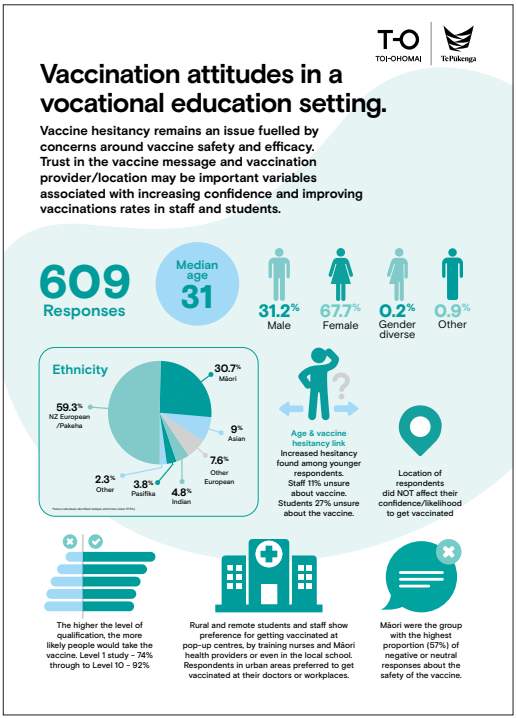
Responses to the question, *"Will you take the Pfizer/BioNTech COVID-19 vaccine?"*, grouped by intention to get the flu vaccine: yes, maybe or no; 1=Definitely not, 2=Most unlikely, 3=Unlikely, 4=Unsure, 5=Likely, 6=Most likely, 7=Definitely, 8=Already vaccinated. Percentages displayed on the left of the graph indicate % of negative responses, those on the right indicate % of positive responses.

DISCUSSION

There was an approximate response rate of 12.9% in the current study. The responses have provided an insight into staff and students' attitudes, intentions and readiness toward the COVID-19 vaccination. This information has led to the development of an infographic used throughout Toi Ohomai Institute of Technology, highlighting key findings from the survey.

Figure 6. Infographic highlighting the key study findings. Source: Authors

Respondent demographics were reflective of our institute's population demographic with the individual percentages within ± 5%. For example, 31.2% of respondents were male and the actual makeup of our population within the institute at the time of our online questionnaire was 35.7%.



For the *true* statements regarding the safety and public information messages about COVID-19 vaccinations, about one third (6/15) of the statements received agreement from >75% of respondents. However, in many true statements, >25% of respondents disagreed, highlighting a gap in knowledge for these respondents. Some of the questions around safety and public information were quite technical, requiring understanding of the current research and vaccinations in general or relying on the respondents' ability to remember specific technical information (e.g. *"The Pfizer/BioNTech vaccine has been shown to be 95% effective."*).

For the six false statements, respondents mostly disagreed with five of them, indicating the majority of respondents correctly understood many of the messages regarding the safety of the COVID-19 vaccine and could identify misinformation. For example, only 6.6% agreed with the statement *"The COVID-19 vaccine can alter your DNA"*. There was one question where most respondents (84.7%) incorrectly agreed with a false statement *"Those who are pregnant, breastfeeding or think they may be pregnant should talk to the doctor or midwife before having a COVID-19 vaccine."* One possibility for the high rate of agreement with this statement is that many people misunderstood or were not aware of the government's public health messages informing them that the COVID-19 vaccination is safe to have when pregnant or breastfeeding. Vaccine hesitancy may be higher in certain 'special populations' like pregnant women in part due to concerns they are not sufficiently represented in clinical trials (Dodd et al., 2021; Skirrow et al., 2022). However, we acknowledge, it is not incorrect for pregnant and breastfeeding women to discuss any vaccinations with a doctor or midwife to ensure the safety of their baby. It is also possible that the wording of this question may need to be improved to provide the correct intent of the statement is conveyed.

Our findings also highlight areas for improvement in public health messages and campaigns. Many of the statements based on opinion were technically false, such as *"COVID-19 vaccine development was rushed"* or *"Taking the COVID-19 vaccine may leave my health overall worse."* The majority of respondents disagreed with 17/18 of the statements of opinion, most people agreed with the safety of the vaccine and the importance of taking the vaccine. However, it also indicates that some people still have concerns regarding the vaccine safety, such as the long-term effects from the vaccine (52% agreed with the statement) or unknown side effects (40% agreed with the statement).

Age-related differences in vaccine hesitancy are a well-researched phenomenon with attitudes towards willingness to seek a COVID-19 vaccination consistent with those found among studies of adult populations involving different vaccines. A literature review looking at a range of sociodemographic variables influencing seasonal influenza vaccine hesitancy found that older people, those 65 years and above, were more positively inclined towards having the vaccine than younger age groups (Kini et al., 2022). This review of 39 studies across diverse ethnic groups consistently found those 30 years and younger to be up to 70% more hesitant about receiving an influenza vaccination than older people.

The influenza vaccine is a well-established seasonal preventative measure first introduced for public use in the 1940s (Centers for Disease Control and Prevention, 2019). However, there are similarities between reluctance and acceptance of COVID-19 vaccination. Concerns about the efficacy and quality of the influenza vaccine are responsible for lower acceptance, while greater awareness and understanding encourage less hesitancy among older people (Gazibara et al., 2019).

While education had a small but significant effect on willingness to be vaccinated in this study, a similar relationship is found across other populations and vaccines. A large European study found that those holding a tertiary level qualification were more willing to receive a Covid-19 vaccine with the level of willingness increasing as the level of the qualification advanced (Valckx et al., 2022). The pattern is also seen among parents and caregivers willing to receive an influenza vaccine and to vaccinate children. Those with higher education levels were more likely to be vaccinated and seek an influenza vaccination for their children (Goss et al., 2020).

The location of dwelling in this study had no impact on confidence and likelihood of having a COVID-19 vaccination. However, this may reflect the unique characteristics of the study sample as housing insecurity among more vulnerable populations is associated with a noticeable increase in vaccine hesitancy (Moore et al., 2021).

Those who did not indicate vaccine hesitancy in this study were willing to receive a COVID-19 vaccination from one of the nominated providers for the national campaign while rural dwellers indicated they preferred to access their vaccination from a trusted provider. These perceptions are consistent with Fisher et al. (2021) who indicate that people who are more vaccine hesitant prefer to seek both vaccine information and a vaccination from a trusted healthcare provider in a familiar location.

Respondents who intend to get the COVID-19 vaccine are also more likely to get (or have already received) the influenza vaccine. In contrast, those unsure or who do not intend to get the COVID-19 vaccine are also less likely to get the influenza vaccine. This finding indicates a relationship between overall vaccine intentions, i.e., likely to get both vaccinations or less likely to get both vaccinations (Maor & Caspi, 2022; McSpadden, 2021).

Limitations

One of the current study limitations was the low response rate. The low response rate was possibly due to the time of the year that the survey was distributed. June 2021 was busy for students (e.g., completing assessments and classwork) and staff (e.g., teaching and marking commitments). It may have been better to distribute the survey at a different time of the year to improve the response rate. Weekly reminders could have been automatically set up when students and staff log on to the local intranet to enhance the response rate further.

Another limitation of the current study is the survey design. Respondents had to self-select responses, and there is no way to confirm the data is correct or that the respondents understood the survey intent. The survey could have been pilot tested for reliability by implementing a test-retest validation process. This would determine if the survey was reliable and that responses correlated over time, which would indicate survey stability.

Practical implications

Our findings showed that there were differences in attitudes and intentions towards the COVID-19 vaccine among different groups (e.g., age, education level and ethnicity). Therefore, a *one-size-fits-all* approach to vaccine provision and educational messaging to vocational staff and students is not suitable. To ensure equitable access to vaccines, we must ensure certain groups with low vaccine confidence are appropriately targeted and provisioned.

The increased importance of local healthcare providers (e.g., churches, marae, Māori health providers marae) in rural communities, highlight the importance trust and connection for people in these communities. Therefore, a focus on establishing trust and building relationships between healthcare providers and community may improve vaccine uptake and education, particularly in rural settings. Vocational institutes that have established connections within the regions are well-positioned to provide clear and concise vaccine messaging to their students and staff, and arguably have a social responsibility to do so.

FUTURE RESEARCH OPPORTUNITIES

Our findings highlight a few opportunities for follow-up studies. Our findings have highlighted an imperative to target vaccine educational messaging toward the younger demographic (<35 years), who tended to be more vaccine hesitant. A useful follow-up study could therefore identify the most appropriate and effective format for delivering this messaging to our staff and student (e.g., through social media, on-campus posters, emails).

Our results showed a clear positive relationship between intention to receive the COVID-19 vaccine and intention to receive the influenza vaccine. An interesting question for future investigation would be to look at how the COVID-19 pandemic will affect future uptake of the influenza vaccine. Comparisons of general vaccine uptake in New Zealand, compared with other countries that have been less sheltered from high infection and death rates due to the COVID-19 pandemic would be another intriguing investigation.

CONCLUSION

The location of respondents did not affect their confidence/likelihood to get vaccinated, however, rural and remote students and staff showed a preference for getting vaccinated at pop-up centres, by training nurses and Māori health providers, whereas urban respondents preferred to get vaccinated at their doctors or workplaces.

There was an increased hesitancy found amongst younger respondents, with the higher level of academic qualification obtained leading to increased likelihood of vaccination. Māori had the highest number of negative or neutral responses about the safety of the vaccine.

Vaccine hesitancy remains an issue fuelled by concerns around vaccine safety and efficacy. Trust in the vaccine message and the vaccination provider along with the location/ease to be vaccinated, appear to be important variables associated with increasing confidence and improving vaccination rates in staff and students.

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Dr Kathryn Ross https://orcid.org/0000-0003-0064-6744 is an applied ecologist with broad interests in environmental monitoring and management. However, her career began in 2007 with a role in healthcare communications and she maintains an interest in this field. She is a Senior Academic staff member and has worked at Toi Ohomai Institute of Technology since 2019, doing teaching and research.

Rachel Scrivin https://orcid.org/0000-0003-4293-1834 is a New Zealand Registered dietitian and an Accredited (Advanced) sports dietitian with Sports Dietitians Australia. Over the last 24 years Rachel has gained experience, working in various senior dietetic roles both in New Zealand and overseas. Currently she is working toward her PhD with a specific research focus on low fermentable oligosaccharide disaccharide monosaccharide and polyols (FODMAPs) as a dietary prescription for reducing exercise-associated gastrointestinal symptoms during endurance exercise.

Mary Cooper https://orcid.org/0000-0002-7029-9103 is a Senior Academic staff member within the Health Department at Toi Ohomai Institute of Technology, leading programmes in infection risk management and health, with a research focus in infection risk management and sterilisation sciences. Mary was part of the development team for the Diploma in Sterilising Technology and has taught on the programme since its inception in 2019.

Campbell Macgregor https://orcid.org/0000-0001-6161-8945: Ko Tākitimu, ko Hananui kā mauka, Ko Kāi Tahu kā iwi and is a Principal Academic staff member and academic lead – health at Toi Ohomai Institute of Technology with an interest in incorporating Mātauranga Māori and cultural responsiveness. Campbell has managed gyms in New Zealand and Australia. Furthermore, he is active in research in the bone health of older athletes, and indigenous solutions. Campbell was named by the American College of Sports Medicine, as their 2013 International Clinical Scholar.

Correspondence to: Campbell Macgregor, 70 Windermere Dr., Tauranga, 3112
Email: Campbell.macgregor@toiohomai.ac.nz

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