



Graduate pathways following nursing education during COVID-19

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ABSTRACT

The COVID-19 pandemic has exerted many effects on populations worldwide. Due to the nature of the pandemic, health and specifically nursing sectors have been particularly impacted. While the nursing sector had to grapple with the impact of the pandemic as well as associated government interventions, nursing students have experienced changes in their job prospects, satisfaction with their training and their propensity to engage in further studies, all impinging on the sustainability of nursing education. This study aims to analyze educational outcomes for nursing graduates undertaking VET (vocational education and training) programs in Australia. Impacts assessed include employment, satisfaction, and further study after completion. The paper is based on analysis of five large waves of a comprehensive survey of Australian vocational education completers, from 2018 to 2022 inclusive. We develop three separate logistic regression models for the outcomes of employment, satisfaction, and enrollment in further study in order to estimate the predictive margins for the interactions between year and field of education, including the Diploma of Nursing, all other health qualifications, and all other qualifications. Our results show that these graduates saw significantly improved employment outcomes and heightened satisfaction during and after the pandemic, pointing to the sector meeting sustainability challenges. Interestingly, enrolment in further studies, after a notable increase earlier in the pandemic, returned to pre-pandemic levels as the crises abated.

1. Introduction

The COVID-19 pandemic had wide-reaching impacts across society (Hall et al., 2020) with nurses, nursing students and other healthcare workers disproportionately affected due to their daily engagement with the crisis. Impacts included increased work and social pressure, job insecurity in places, and stress. In addition, changes to clinical placement arrangements, disruptions to nursing studies, and exam cancellations tended to complexify nursing educational arrangements.

This study aims to analyze educational outcomes for nursing graduates undertaking VET (vocational education and training) programs in Australia. Impacts assessed include employment, satisfaction and further study after completion. These are compared, inter alia, to other graduates during and after the pandemic. Understanding these outcomes is essential as it will inform policies and interventions that enhance the wellbeing of nursing graduates and healthcare professionals and contribute to the sustainability of nursing education.

1.1. Background

In the period prior to the pandemic, the Australian nursing profession was under significant stress (Maharaj et al., 2019). This was common in many countries but was accentuated in specific contexts in Australia due to regional health challenges and relatively low wages.

On the demand side, the ageing population, growth in chronic diseases and issues around healthcare access had all increased the workforce requirements for qualified nurses (Griffiths et al., 2020). Among nurses, however, problems associated with burnout and retention were common, especially in sectors like aged care (Woo et al., 2020). Together these two opposing trends were making the overall task of staffing the profession in Australia increasingly challenging.

Nurse training had continued to evolve in response to these complexifying trends associated with technology, healthcare quality and leadership. These changes were informed, in part, by the WHO's "State of the World's Nursing Report" (Duff, 2020). The Australian states and territories were also moving to implement normalized licensing requirements by way of harmonization of nursing registration and practice

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standards across different states in part to increase nursing mobility for areas of acute need (which was often noted in regional and remote areas).

The COVID-19 pandemic caused major disruption to all sectors of the economy, although arguably its most direct impact was on the healthcare sector (Delardas et al., 2022). Much routine work was halted, delayed or reduced due to concerns of viral transmission. Additionally, routine procedures were halted to sequester resources for possible needs relating to pandemic casework.

More generally, the pandemic had significant and wide-ranging detrimental impacts on the healthcare sector. For example, most healthcare systems experienced higher costs as safety measures, personal protective equipment, required technology and temporary contingent facilities were rapidly acquired (Wei et al., 2021). Inconsistent management of the pandemic across jurisdictions complicated the ability for a consistent approach to be adopted (Anttiroiko, 2021; Cyr et al., 2021).

These changes had direct, generally negative yet inconsistent impacts on nurse workforces. For example, in the first months of the pandemic many nurses were laid off, particularly those working in healthcare facilities that did not have the appropriate clinical resources to continue operations. At the same time, the pandemic caused a spike in demand for critical care for patients infected by the virus (Moore et al., 2022).

The pandemic restricted travel, leading to less availability of nurses, physicians and medical supplies, particularly in rural or developing countries. Medical staff, including doctors, nurses, and hospital workers, had to immediately change working patterns and established practices to tackle the pandemic (Greenberg et al., 2020). For example, structures of diagnosis and care were changed to allow remote diagnosis and treatment. Patient volumes spiked depending on viral caseload, and future scenarios were often unclear as knowledge about the nature of the virus slowly emerged, making planning difficult (Hayashi et al., 2020; Lo et al., 2021). To cope with specific shortages in key clinical areas, nurse managers faced shortages in nursing staff and had to use strategies such as mobilizing and rotating staff and recruiting volunteers.

1.2. Psychological impacts on Nurses

Nurses globally have been observed to have higher levels of mental health related concerns, including burnout and anxiety. These were exacerbated during the pandemic (Duarte et al., 2022; Pappa et al., 2020).

Nurses experienced emotional and psychological trauma, and ICU nurses reported high levels of burnout symptoms (Fernandez et al., 2020). Health professionals, including nurses, are at a generally increased risk of developing mental health issues due to the high levels of stress, uncertainty, and workloads that they face. These were all accentuated by the pandemic, causing negative mental health impacts widely.

During the pandemic the prevalence of anxiety among healthcare workers increased, with a higher prevalence among nurses (Sahebi et al., 2021). Drivers of these problems related to perceived safety issues, job insecurity and the emotional intensification of work coupled with a general sense of uncertainty shared with the wider community about the nature of the pandemic and its social and economic consequences.

Safety issues increased for nurses during the pandemic (D'emeh et al., 2021). Significant uncertainty surrounded the seriousness of the pandemic in its early iterations and nurses, as the primary frontline carers, had to manage patient care while also maintaining personal health concerns relating to contamination and the potential impact on their friends and family.

The concomitant disruption in routine care, and the spike in care requirements elsewhere, created significant role uncertainty and job insecurity. This compounded longstanding problems in the sector, and in the nursing occupation in particular, relating to job insecurity, high

levels of stress, burnout, and poor job satisfaction (Arnetz et al., 2020).

The pandemic also had negative impacts on nurses' work satisfaction (Savitsky et al., 2021). In many ways the pandemic simply exacerbated and highlighted existing shortages of resources and medical personnel that had dogged the sector for decades. This tended to result in increased workload and stress for nurses and other healthcare workers (Arnetz et al., 2020).

Those nurses working in frontline pandemic roles also reported feeling overwhelmed, heightened anxiety and exhaustion (Shan et al., 2021). The pandemic posed psychological burdens on medical personnel, such as dealing with critically ill patients, the risk of contracting the virus, and traumatic responses to healthcare events (Kisely et al., 2020). Many COVID-19 patients experienced severe illness, requiring intensive care support and extensive and difficult medical intervention. Nurses caring for these patients were required to provide emotional support to patients and their families, often during end-of-life care. Mental health-informed interventions were necessary to facilitate coping among healthcare workers.

1.3. Nursing students and Covid

A limited amount of research considered the experiences of nursing students during the pandemic. These trainee nurses also experienced stress and disruption due to the pandemic. For example, they faced disruptions to their studies, exam delays and cancellations, and changes to clinical placement arrangements. Evidence suggested that the changes needed to support students as a means of ensuring their study completion and graduation were patchy.

For example, in a study among nursing students in three Turkish universities Aslan and Pekince (2021) found that nursing students enrolled through the period 2020–21 were exposed to long-term, uncontrollable stressors during their key learning phase. These were seen to have negative impacts on both their professional identity development and health. These stressors included changes in their academic conditions (class arrangements and assessment), disruption to daily activities, impacts on physical and mental health, their social life and communication. Notably, their nursing program knowledge and skills seemed to have been affected negatively, hindering their personal and professional development.

In this present study we aimed to analyze the impact of the COVID-19 pandemic on outcomes of students who graduated from nursing programs in vocational education and training institutes in Australia by interrogating survey data that covers the period prior and during the COVID-19 pandemic. These outcomes investigated include employment, the uptake of further study, and graduate's satisfaction with their training.

This study assesses the outcomes of students enrolled in vocational education nursing programs in Australia from 2018 to 2022, a period encapsulating the emergence and later decline of the influence of COVID-19 on the Australian community.

In Australia those interested in pursuing a nursing career, can enroll either in a Diploma of Nursing qualification through registered training organizations or directly into a higher-level bachelor's program, generally offered through universities (Christiansen et al., 2018).

The diploma-level qualification of 18 to 24 months duration is a pathway to registration as an Enrolled Nurse (EN). Once complete, prospective Enrolled Nurses must complete an English proficiency test if English is not their first language, undergo a criminal history check and apply to the Nursing and Midwifery Board of Australia with proof of identity and educational transcripts.

ENs are generally supervised by a registered nurse and deliver nursing care for patients across the health sector. The diploma also provides a pathway to advanced enrolment in a bachelor level program, providing direct entry into the second year of the Bachelor of Nursing three-year program at many universities. Of the 34 % of students Nursing graduates that enroll in further study, 66 % do so at the

Bachelor level.

The Diploma of Nursing has dual elements related to theoretical and applied learning, undertaken on-campus and within clinical placements. Placements generally occur over 400 h and entail a rotation between different practice areas (often aged care, mental health and acute). Some VET institutions have partnerships with universities designed for students who have completed the Diploma of Nursing and wish to in Bachelor level studies to become a registered nurse. After initial registration ENs are required to engage in ongoing professional development to maintain registration. This may be undertaken within VET-based training organizations, or through other providers.

2. Data and methods

We used weighted and stratified survey data from the Student Outcomes Survey and the Students and Courses database at the National Centre for Vocational Education Research (NCVER) for this investigation. Data Builder from NCVER was used to query enrolment and graduation information from the Students and Courses database (NCVER, 2023a).

The National VET Provider Collection, from which the Students and Courses data releases are derived, was created using data provided by Australian training providers. This database is based on that collection. Data on enrolment rates, programme and subject enrolments, programme completion rates, and training providers are all included in the database. Further information regarding this database can be obtained from NCVER (2023b). The Australian Student Outcome Survey (SOS) results for the years 2018 to 2022 were used to estimate employment outcomes for nursing, other health, and all other vocational students. The survey is conducted by NCVER and covers Students who have successfully finished a course or a portion of a course and then left the VET system are the target audience for the survey.

The Student Outcome Survey is a large annual survey that employs a stratified random sampling scheme and seeks to compile outcome data on students who have left the VET system with respect to their work status, the motivations for their training, how applicable it is to their jobs, any plans for future education, the reasons they chose not to pursue further education, and their happiness with their training experience. IRB approval was not sought for this article. The article does not contain studies with human subjects but represents a secondary data analysis for which we used de-identified data that did not contain any confidential information.

In 2021, the eligible identified population of qualification completers was around 462,000 of which 452,000 were invited to participate in the survey. Of this number 147,000 (32.6 %) completed the survey (NCVER, 2021). The survey uses a fully stratified, systematic sample design. Graduation status, institutional, regional, demographic, and educational factors such state/territory, provider type, financing source, age, gender, area of study, remoteness score, graduation, and indigenous status are all included in the stratification categories. The Students and Courses database population criteria are used to weight survey results. The large sample size, in combination with a weighting mechanism that accounts for non-response yields a survey that exhibits a high degree of reliability and accuracy. The survey is discussed in more detail in Fieger (2012).

For the purpose of our analysis, we extracted the variables of interest, including whether a job was obtained after training, whether further study was taken up, various Likert style satisfaction items, and a number of educational and demographic variables, such as age group, gender, an indicator for socio-economic disadvantage SEIFA (for a description see: ABS, 2016), an indicator for the field of education studied (nursing, other health, all others). The five annual datasets (2018–2022) were stacked and a variable indicating the year was added to the combined dataset.

For the dependent variables of employment outcome, further study, and satisfaction we created three logistic regression models with

identical predictor variables. Predictor variables were the year, a categorical variable indicating the field of education (diploma of nursing, any other health qualification and all other fields of education), an interaction variable to enable the estimation of predicted margins of year and field of education, as well as some demographic variables comprising age group, sex, and the SEIFA variable, indicating socio-economic disadvantage. The latter three variables were added to the model in order to adjust for demographic cohort changes between the individual survey years. Structuring our models this way allowed us to estimate the three outcomes based on the predictors and confounders and to subsequently estimate the predicted margins for the variables of interest, e.g. the interaction of year and field of education to gain insights on how outcomes have changed over time, adjusted for cohort differences between the years of analysis.

3. Findings

In the first step of our analysis, we queried the Students and Courses administrative database with respect to enrolments and graduations in the diploma of nursing. Results can be seen in Fig. 1. It is evident that there were no substantial changes in enrolment numbers in the periods prior and during the COVID-19 pandemic, with annual enrolments hovering around 26,000 students. During the same period, graduations decreased slightly, from 7215 in 2018 to 6330 in 2021. While these figures cannot be used to directly determine completion rates, there is an apparent gulf between enrolments and completions, which represents a persistent issue in Australian vocational education and training that is frequently discussed in the academic literature (Fieger, 2015; McDonald, 2018). Given that students graduating in 2021 will have started their studies in 2019 it is possible that the decline in 2020 and 2021 completions has some association with the COVID-19 pandemic, however, given the relatively small reduction the decline also be due to natural variation in graduation numbers.

The main interest in our study was the investigation into outcomes for those who completed their Diploma of Nursing and the comparison to the entire student cohort who graduated from the VET sector, as well as those who graduated from other health related disciplines. The basic student cohort characteristics of graduates with respect to gender and age group can be seen in Table 1. It is notable that there was a significant increase in younger graduates between 2020 and 2022, coinciding with the COVID-19 pandemic. This increase can be seen across all of vocational education, although it was less pronounced in nursing. The reason for the strong increase in graduation numbers can be seen in the introduction of several government support programs to support economic recovery from COVID-19 pandemic (AIHW, 2023) as well as an increase in uptake in the VET in schools program (a program designed to encourage training for a career before leaving school) (NCVER, 2020).

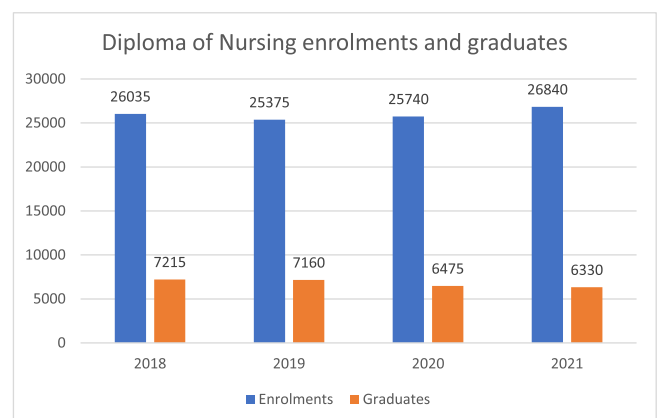


Fig. 1. Enrolments and graduations in the Diploma of Nursing from 2018 to 2021.

Table 1
Basic characteristics of graduating student cohorts.

	2018	2019	2020	2021	2022
All VET					
Sex					
Male	50	49	50	51	50
Female	50	51	49	48	49
Age					
<20 years	8	9	27	34	32
20 to 24 years	21	21	16	15	14
25 to 44 years	48	47	37	34	37
45 to 64 years	22	22	19	16	16
>64 years	1	1	1	1	1
All other health					
Sex					
Male	36	34	33	31	29
Female	64	66	67	68	70
Age					
<20 years	7	7	27	31	35
20 to 24 years	18	19	16	14	15
25 to 44 years	49	47	38	35	35
45 to 64 years	25	26	18	18	15
64 years	1	1	1	1	1
Nursing					
Sex					
Male	16	17	18	19	17
Female	84	83	82	81	82
Age					
<20 years	5	5	8	14	14
20 to 24 years	24	26	32	31	28
25 to 44 years	50	51	45	41	44
45 to 64 years	21	17	15	14	13
>64 years	<1	<1	<1	<1	<1

The student outcome survey includes several indicators of such outcomes, of which we have chosen employment, further study and satisfaction with the training, as these are outcomes that we expected to have been severely affected in the course of the COVID-19 pandemic.

3.1. Satisfaction with the training

The model results are displayed in the ‘Satisfaction’ columns of [Table 2](#). Generally, without respect to field of education and year, it can be seen that all age groups are less satisfied with their training than the reference age group (< 20 years old), although satisfaction is generally very high ([Fig. 2](#)). Females are slightly less satisfied with their training than males, and a more disadvantaged background is associated with higher satisfaction. We speculate that gender stereotypes, differences in experiences and aptitudes as well as classroom experiences may be causal for differences in satisfaction between genders. Other researchers have also noted that satisfaction relating to training can often vary between genders (for example [Bönte & Krael, 2014](#)).

More specifically, the calculated margins of the interaction between year and field of education show nursing graduates are generally less satisfied with their training, however, satisfaction improved significantly in 2020 ($p < 0.001$), coinciding with the COVID-19 pandemic ([Fig. 2](#)). This pattern is repeated by graduates in all other health fields of education and could indicate a trend or pattern whereby workers who were displaced by the pandemic’s employment impacts sought to retrain for more favoured or desired occupations ([McFarland et al., 2020](#)). Nonetheless, one year into the pandemic (2021) satisfaction estimates declined slightly for nursing graduates, and continued to decline in 2022, although still remaining noticeably higher than pre-COVID-19. The increased satisfaction with nursing course learning was also observed in Spain in relation to changes before and after the pandemic ([Ruiz-Grao et al., 2022](#)).

The model results for employment after training are displayed in the

Table 2
Logistic regression models for employed after training, satisfaction and further study.

Employed after training	Employed		Satisfaction		Further study	
	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
Age group (ref < 20 yo)						
20 to 24 years	0.49	<0.01	-0.22	<0.01	-0.14	<0.01
25 to 44 years	0.77	<0.01	-0.22	<0.01	-0.52	<0.01
45 to 64 years	0.77	<0.01	-0.22	<0.01	-0.78	<0.01
65 years +	0.41	<0.01	-0.15	<0.01	-0.91	<0.01
Sex (ref = male)						
Female	-0.12	<0.01	-0.05	<0.01	0.12	<0.01
Year (ref = 2018)						
2019	-0.04	<0.01	0.13	<0.01	0.06	<0.01
2020	-0.14	<0.01	0.09	<0.01	0.11	<0.01
2021	0.05	<0.01	0.15	<0.01	0.18	<0.01
2022	0.37	<0.01	0.15	<0.01	0.09	<0.01
FoE (ref = All other VET)						
All other health	0.32	<0.01	-0.01	0.868	0.20	<0.01
Diploma of Nursing	0.43	<0.01	-0.62	<0.01	0.27	<0.01
Year * FOE (ref = all other VET)						
2019 * all other health	0.06	0.27	0.03	0.56	0.05	0.23
2019 * Dip of Nursing	-0.05	0.64	-0.08	0.33	0.00	0.97
2020 * all other health	-0.09	0.08	0.24	0.00	0.08	0.03
2020 * Dip of Nursing	0.04	0.75	0.42	0.00	0.18	0.01
2021 * all other health	-0.08	0.13	0.07	0.17	0.08	0.03
2021 * Dip of Nursing	0.09	0.44	0.18	0.04	-0.12	0.11
2022 * all other health	0.00	0.94	0.04	0.49	0.08	0.02
2022 * Dip of Nursing	0.33	0.02	0.04	0.66	-0.04	0.61
Disadvantage (ref = most)						
Quintile 2	0.38	<0.01	-0.08	<0.01	0.02	0.01
Quintile 3	0.41	<0.01	-0.13	<0.01	0.03	<0.01
Quintile 4	0.46	<0.01	-0.20	<0.01	0.05	<0.01
Quintile 5 (least)	0.57	<0.01	-0.25	<0.01	0.13	<0.01
Intercept	0.76	<0.01	2.24	<0.01	-0.57	<0.01
Sample size	N = 587,399		N = 673,295		N = 667,585	
Model significance	Prob > chi2 < 0.01		Prob > chi2 < 0.01		Prob > chi2 < 0.01	

‘Employed’ columns of [Table 2](#). Overall, it is evident that females have a slightly lower propensity to be employed after training than males. There are many factors that may contribute to different employment outcomes between males and females, and these may involve gender stereotypes, vocational subject choice, networking, personal factors and work life balance considerations. There is also evidence that coming from a less advantaged community is associated with a lower probability of employment.

With respect to the specific relationship between employment and year and field of education the calculated predictive margins ([Fig. 3](#)) show that diploma of nursing as well as all other health graduates have substantially better employment outcomes than other graduates in the pre COVID-19 era. While other health graduates’ employment outcomes initially declined at the beginning of COVID-19, diploma of nursing and other health graduates improved their employment outcomes significantly as the pandemic proceeded ($p = 0.031$ from 2020 to 2021 and $p < 0.001$ from 2021 to 2022), with nursing graduates having a probability to be in employment well in excess of 90 % in 2022.

Further study after training is an essential pathway to improved social outcomes and income potential. However, often enrolment in

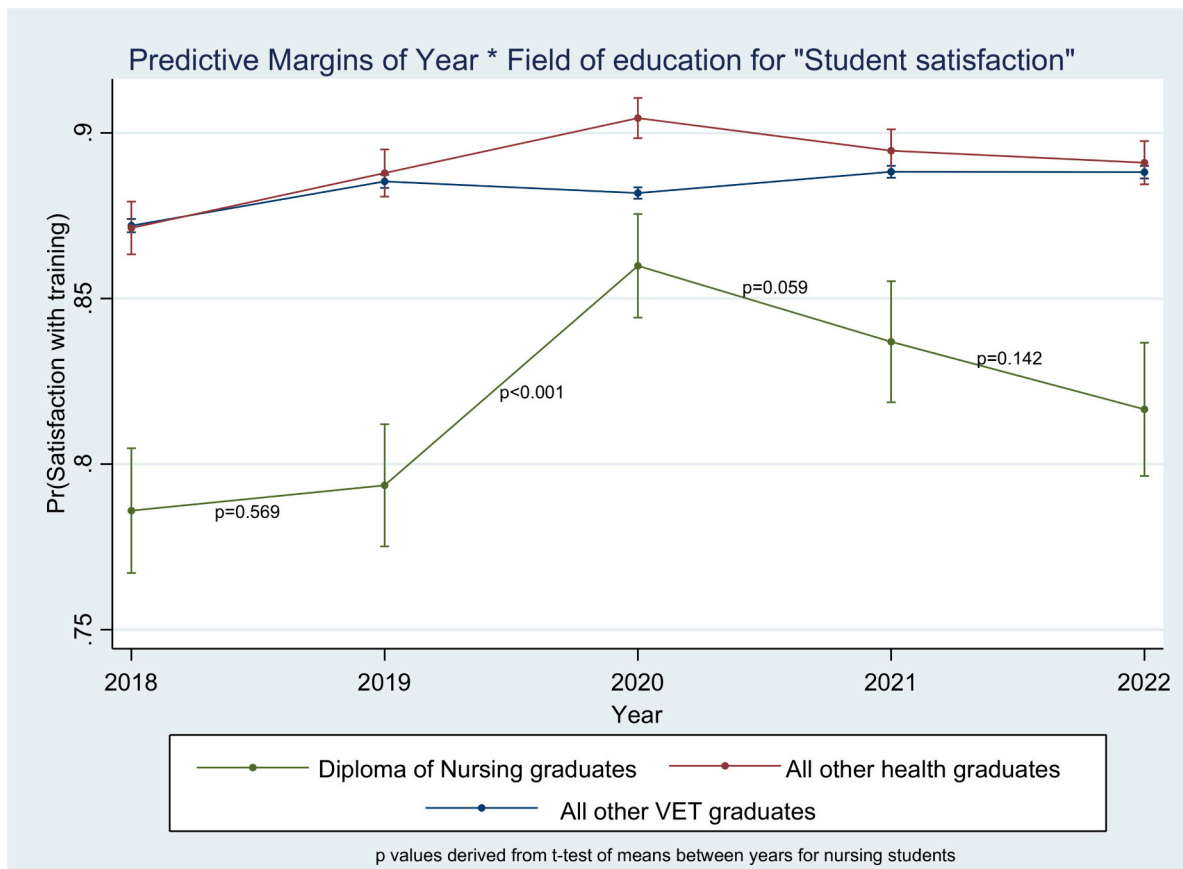


Fig. 2. Satisfaction with the training.

further study may also be an indicator of a lack of employment opportunities at the conclusion of students' education. It was therefore of interest to study how nursing graduates' enrolment in further study fared in the context of the COVID-19 pandemic. The 'Further Study' columns of Table 2 display the estimates of our logistic regression model evaluating this outcome. Irrespective of year and field of education, Australian VET students tend to be less inclined to enroll in further study the older they are. Females have a higher propensity of further study, whereas there is a strong association of a higher probability of further study the less disadvantaged one's area of residence is.

Prior to the COVID-19 pandemic, Diploma of Nursing graduates and all other health graduates had a substantially higher propensity to enroll in further study than all other VET students. Nursing graduates' probability of further study increased significantly 2020 ($p < 0.001$), though pulled back to pre-pandemic levels in 2021 and remained constant in 2022 (Fig. 4). This may be related to health services being significantly, yet differentially, impacted in the early stages of the pandemic. As the sector saw cuts in some areas, early career nurses felt investing in further education was worthwhile to better qualify for positions in the future.

The impact of the pandemic on the labor market however had a contrasting effect for all other VET students. The probability of enrolling in further study for all other VET students decreased substantially in 2020, then stabilized in 2021 and to 2022 relative to pre-pandemic levels. This may have been due to the increasing popularity of VET qualifications following the pandemic, with more people turning to VET courses in the midst of widespread unemployment. This would align with the work of Avis et al. (2021) who have noted that post-Covid trends may re-emphasise the value of VET education as an emancipatory activity for many workers.

The overall impact of the COVID-19 pandemic on VET vacancies is significant. Interestingly, it appears that Nursing graduates received a

boost in their probability of enrolling in further study, whereas all other VET students had a reduced probability. This highlights the important role of nursing qualifications in the context of employment opportunities and provides a positive outlook for those investing in nursing qualifications.

The pandemic appears to have had a significant positive effect on the number of VET-qualified vacancies that were available in the job market for VET graduates. Specifically, nursing VET graduates showed an increased chance of enrolling in further studies, while this was not evident for other VET students. This would support the conclusion that nursing VET qualifications improved their value in the context of the post-COVID-19 employment environment.

It needs to be kept in mind that many of the further study respondents will also have had secured a job already and increased pandemic related work commitments may have impinged on further study enrolments in 2021 and 2022. This is the counterpoint to the employment market success of VET nursing graduates. As their employment opportunities improved, their desire to pursue other post-training options was reduced.

4. Discussion

Our study finds that during the pandemic VET nursing graduates experienced significant improvements in their post-study employment outcomes as measured by both propensities to be employed in the post-study year, and also outcomes related to satisfaction. Additionally, there is evidence to suggest that, compared to other VET graduates, VET nursing graduates tended to pursue further study at a higher rate than other graduates.

One explanation may be the increased demand for healthcare workers, both during the pandemic and also as the labour market

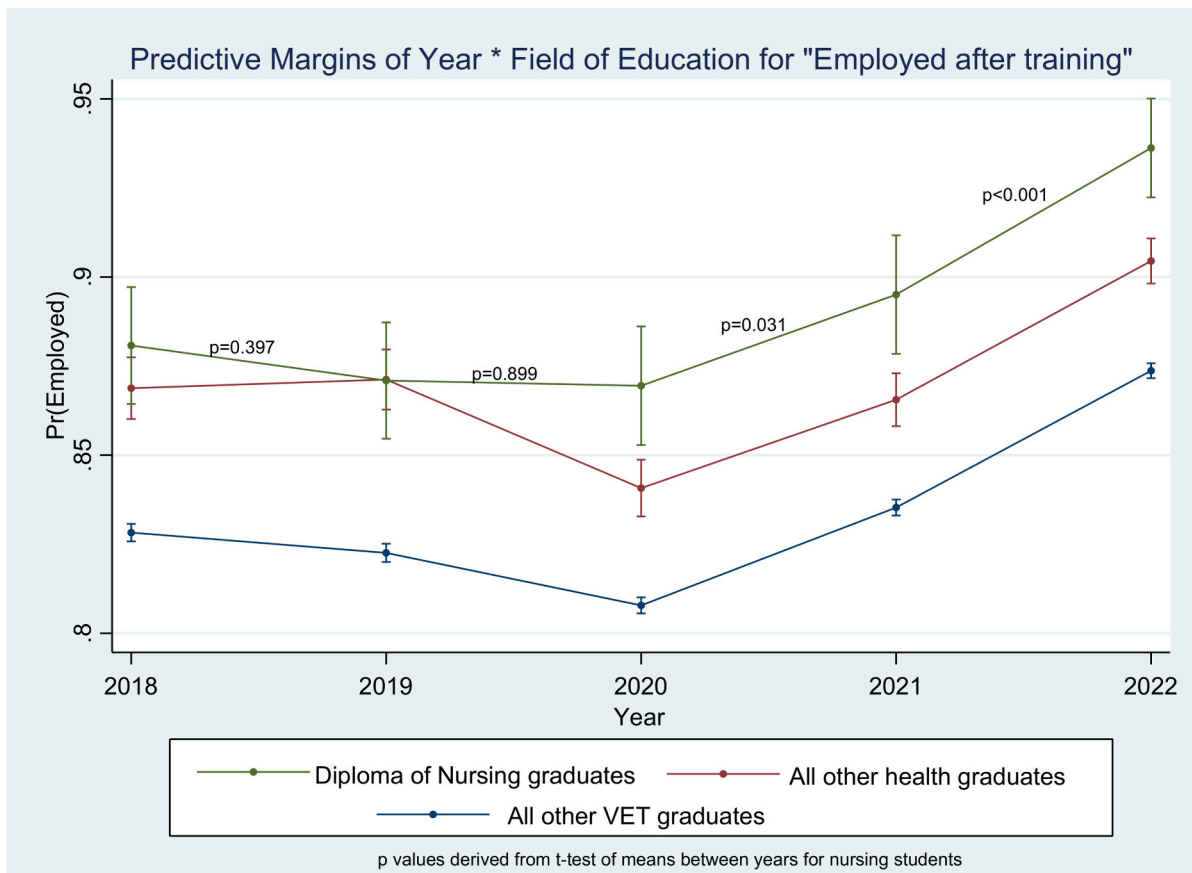


Fig. 3. Employed after training.

normalized post-pandemic. The preference of employers may have also shifted towards the employment of enrolled nurses who have completed VET qualifications, rather than university-accredited nurses who may have been in short supply and had a longer training lead-time.

Extending this explanation, during the phase of a sharp increase in demand for healthcare professionals, including nurses, during the pandemic employers' preference for VET qualified nurses over university-accredited nurses would provide an indirect explanation of why VET nursing graduates experienced improved post-study employment outcomes in comparison to other VET graduates. Additionally, the pandemic may have disrupted the ongoing study plans of VET-based respondents, with this particularly the case for those who had secured employment and were facing heightened work commitments. This may have influenced their enrollment plans for further study in 2021 and 2022.

Additionally, the shift to virtual learning as a contingent response to the lockdown, and also towards flexible, self-paced learning modes, may have enhanced the value and popularity of VET qualifications. These modes are better suited to learners who continue to work full time and are less common in university-accredited programmes (Avis et al., 2021; Routh et al., 2021).

Overall, the pandemic had profound impacts on the employment prospects of VET graduates, with generally negative outcomes (Cortes & Forsythe, 2023; Fieger et al., 2024). However, it is clear that nursing VET graduates have fared better than others during the pandemic, with increased employment outcomes, satisfaction and sought after study opportunities. These positive outcomes highlight the importance of continuing to invest in and support VET qualifications, and particularly nursing VET qualifications, which were of vital importance to the Australian society and health sector during this period of crisis.

5. Conclusion

Using a large survey of graduates, this study explored the impact of the COVID-19 pandemic on employment opportunities for VET graduates, focusing on nursing VET graduates in particular. We found nursing VET graduates experienced considerably improved employment outcomes during and immediately after the pandemic. This can be attributed, in whole or part, to the increased demand for healthcare workers and the preference of employers to employ nurses with VET qualifications as a result of the pandemic.

This was evidenced by a greater probability of being employed in the year after training, and higher enrolment rates in further study compared to other VET graduates. This suggests that the pandemic has had a positive effect on the employment prospects of VET nursing graduates.

Related to the specific findings, further outcomes are identified. The pandemic also highlighted the importance of a sustainable healthcare sector while highlighting existing fragility in some key areas of healthcare. As a sector that has struggled with resource shortages in key areas, the pandemic brought into clear relief the challenges that the sector has faced. Principal among these challenges is the development and sustenance of a strong workforce who can ensure the sector's resilience in times of challenges.

The pandemic has exposed shortcomings in how healthcare is managed, funded and staffed. To protect against current and future health crises, contingency planning should be strengthened, funding for healthcare resources increased, and recruitment, retention and training strategies for professionals improved.

Supporting nurses, and training new nurses, was essential in responding to the COVID-19 crisis. The need to take proactive measures to protect nurses and ensure their well-being was highlighted by

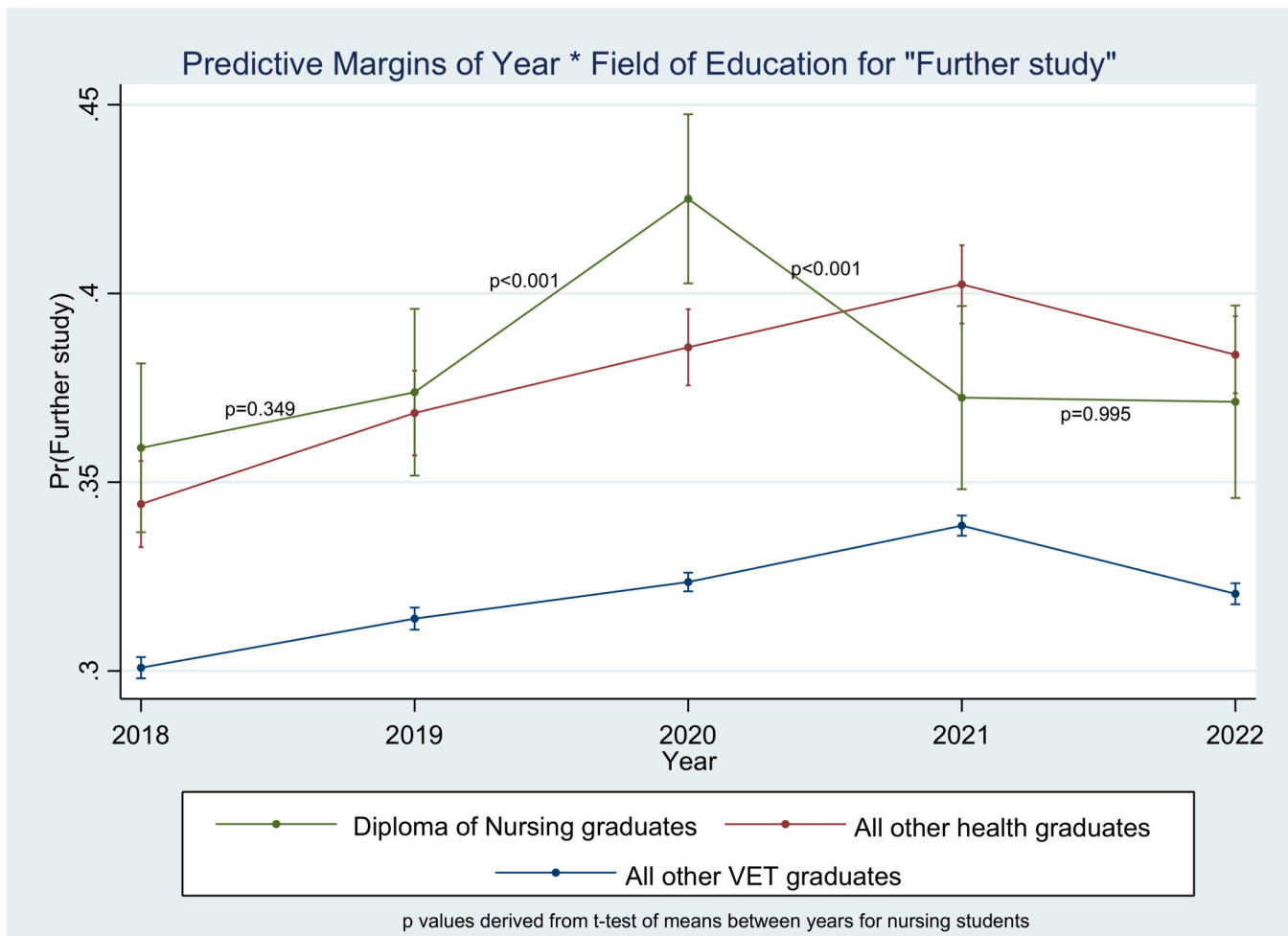


Fig. 4. Further study after training.

instances where this did not occur. Such requisite future measures included improved communication between healthcare organizations and nurses, an improved workplace culture able to support nurses physical and mental wellbeing, and access to mental health services and support.

Nursing students experienced greater stressors during the pandemic, including fear of infection, physical harm, transmission of the virus to friends and family, and being overwhelmed by the care they may need to provide. It is recommended that teaching institutions develop strategies to help nurses in training cope with such stressors. These may include mentorship programs, improved use of appropriate technology and the positive recognition of student efforts. Additionally, increased access to mental health support programs, respite where warranted, additional time-off and formal and tangible appreciation for the challenging conditions of their work during the pandemic should be provided.

6. Limitations

Like all studies based on secondary data, we were only able to use the data available within the questionnaire deployed. While professionally developed and executed, the study was limited to its initial scope and purpose which did not, in some respects, completely cover all possible explanations for the outcomes noted here. First, as we noted earlier, there has been a long-term trend in Australia and elsewhere of workforce pressure which, other things being equal, must lead to an equalization of the nursing labor market through improved conditions.

The Covid-19 pandemic has impacted societies in numerous ways.

While we investigated in this research some of the pandemic’s direct effects on some aspects of nursing education outcomes, there may have been indirect impacts that we could not control for in our study. For instance, changes in migration patterns during the pandemic may have indirectly influenced the results of our study.

Attitudinal questions or complementary qualitative investigations provide potential extensions of this study. These may explore the reasons VET-qualified nursing graduates were achieving improved satisfaction and work outcomes. These may be related to factors extraneous or partially related to our study.

CRediT authorship contribution statement

Peter Fieger: Writing – review & editing, Formal analysis, Data curation, Conceptualization. **John Rice:** Writing – original draft, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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