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Preparing Graduates to Meet the Allied Health Workforce Needs in Rural Australia: Short-Term Outcomes from a Longitudinal Study

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Abstract: The future allied health workforce needs to be flexible to meet the needs of an ageing population with increasing chronic health care needs and geographically dispersed populations in many developed countries. Existing research shows the maldistribution of the Australian health workforce, with allied health professionals being poorly represented in rural and remote areas. This mixed-methods longitudinal workforce outcomes study is ongoing to determine the rural and remote allied health workforce outcomes from an immersive student placement program based in rural New South Wales, Australia. Outcomes, to date, show 52% of graduates working in a rural or remote area (RA2–RA5) after one year and 37.5% at three years post-graduation. Students from a rural or remote background were 2.35 times (95% CI 1.056–5.229) more likely to be located in a rural or remote workplace after one year than graduates from a metropolitan background. Graduates provided reasons for their plans to move from or stay in their current position. Four key themes emerged: *Seeking new and different opportunities; Better income and job security; Personal change and lifestyle improvement and Level of job satisfaction*. An existing program to develop the allied health workforce in rural Australia is demonstrating positive short-term outcomes. Ongoing monitoring of workforce outcomes is required to determine the long-term outcomes for rural and remote communities.

Keywords: health professional education; health workforce; allied health; rural health services

1. Introduction

Access to healthcare in non-metropolitan areas is an issue at a global level in both developed and developing countries [1]. The World Health Organization (WHO) has called for investment at a national and international level to improve coverage of health services within and between countries and closer collaboration between researchers and policy makers [2]. Higher proportions of health professionals live and work in metropolitan and higher socioeconomic areas with metropolitan areas often seen as more attractive for social, cultural and professional advantages. A range of factors including individual, work-related and local environment factors [3] have been identified as key to recruiting and retaining health professional staff.

In developed countries, there is wide recognition of the challenges that face the health care system now and into the future and that it will not be possible, nor appropriate to deliver health care services in the same way as they have been delivered in the past. New models of practice must be developed to meet the increasing demand for services, particularly in rural and remote locations where the

health workforce is already stretched too thinly in many regions [4]. Hence, there is a well-recognized need to recruit and retain new graduate health professionals in such locations, to help address the health differential between well-populated metropolitan centers and sparsely populated areas that are relatively undersupplied with health professionals [5,6].

Among the myriad of factors that affect the likelihood of new graduate health professionals entering rural practice [7,8], two that stand out are rural origin (or background) and rural exposure. For example, in a retrospective study of medical graduates from the University of Queensland [9] researchers found that graduates are more likely to enter rural practice if they come from a rural background (OR 2.3, 95% CI = 1.57–3.36) and if they attended the University of Queensland Rural Clinical School (RCS) for one year (OR 1.84, 95% CI = 1.21–2.82). Further, attendance at the RCS for an additional year increased the odds ratio to 2.71 (95% CI = 1.65–4.45). In addition, a growing volume of literature demonstrates that time spent as an undergraduate in a rural location is influential on entering rural practice in early postgraduate years [9–12].

By far, most of the literature focuses on medical students and graduates, while there is much less evidence of the factors that influence rural practice uptake among nursing and allied health graduates [13]. Although Fisher and Fraser [14] suggested extending the concept of the ‘rural pipeline’ used in medicine to nursing and allied health disciplines, significant differences in models of practice, employment opportunities, and clinical supervision of both students and new graduates, as well as social and economic factors, are likely to confound the extrapolation of evidence across the professional boundaries. For example, illustrating the need for creative practice models, a successful program attracting new graduate physiotherapists to one rural area in New South Wales (NSW), Australia, involved a partnership between the private and public health care systems [15]. The opportunity to work part-time in private practice while also having professional support and collegiality through the public system proved attractive. Meanwhile, Brown et al. [16] also proposed possible collaborative solutions, where unfilled part-time positions for dietitians in rural or remote areas could be consolidated into a full-time caseload across the whole region, thus making recruitment more attractive. O’Toole et al. [17] suggested the need to rethink organizational aspects of allied health recruitment and retention, while others have found that a perceived lack of professional development opportunities was a significant disincentive to recruitment and retention of rural allied health professionals [18].

Some studies have found that rural origin is influential on allied health professionals choosing to work in rural areas [19–21]. Similarly, although the evidence is less robust than for medicine, rural undergraduate exposure for allied health and nursing students has potential to increase recruitment and retention of graduates to rural practice by raising their awareness of employment opportunities and exposing them to broader aspects of rural life. Spiers and Harris [19] proposed a rural pathway in allied health programs, particularly targeting students of rural origin. There is also a need to target rural high school students and to promote allied health careers in particular [22], which are generally less well known than either medicine or nursing.

A key part of the Australian Government’s strategy to improve the recruitment and retention of health professionals in rural and remote areas, is the Rural Health Multidisciplinary Training (RHMT) program [23], which provides funding for rural educational experiences for health students from a range of disciplines. As part of the RHMT program, the University of Newcastle Department of Rural Health (UONDRH) supports medical, nursing and allied health students to undertake placements and longer-term attachments in rural NSW. Allied health students can undertake short-term placements of two to eight weeks duration or long-term attachments that may extend over a full a semester or a full year of their studies. During the latter, longer-term attachments, allied health students in the disciplines of nutrition and dietetics, physiotherapy, diagnostic radiography, occupational therapy and speech pathology live in a rural location. They complete both academic and clinical components of their studies remote from the main metropolitan campus, while sharing accommodation and socializing with other students and undertaking extracurricular activities aimed at immersing them in the local

community [13]. The long-term placement program has been ongoing since 2003 in some disciplines and has evolved over time to include others.

In 2011, the UONDRH commenced a longitudinal follow-up study of the allied health students completing short-term placements and longer-term attachments, the overall aim of which was to evaluate allied health students' experiences of their rural placement and to follow their career outcomes. In an earlier analysis [13], it was found that 72.7% of students ($n = 198$) reported an intention to work rurally after placement and 55% of students ($n = 92$) who had never lived in a rural area had a more favorable attitude to working rurally following placement. The aim of this study is to describe and analyze the short-term workforce outcomes from this immersive student placement program located in rural NSW, Australia.

2. Materials and Methods

This longitudinal mixed methods study [13] commenced in 2011 and is ongoing, with a planned five-year follow-up of student workplace outcomes. The detailed methods for this study have been described previously [13]. Specific methods relevant to the data collection reported in the results of this paper are described below. All subjects provided written informed consent before they participated in the study. The study was conducted in accordance with the Declaration of Helsinki. Ethics approval was obtained from the University of Newcastle Human Research Ethics Committee on 6 April 2011 (Protocol Number: H-2011-0027).

2.1. Recruitment

Allied health students enrolled in degree programs at the University of Newcastle (UON) who participated in a short-term (2 to 8 weeks) rural placement or a year-long immersion attachment, were invited to participate in this study. Students were included in the recruitment from the allied health disciplines of diagnostic radiography, nuclear science, nutrition and dietetics, occupational therapy, physiotherapy, radiation therapy and speech pathology. Eligible students were informed of the study and invited to participate during their orientation to the UONDRH, either by the administrative staff member delivering the orientation or by a research assistant. Interested students could then volunteer to participate.

2.2. Data Collection

Students could opt to participate in one or more components of the study: (i) an end of placement survey, (ii) a semi-structured interview and/or (iii) a follow-up survey at one, three and five years after graduation. The end of placement survey, consisting of 37 questions, aimed to evaluate student experiences and degree of satisfaction with placement. The semi-structured interviews explored in greater depth, student experiences, perceptions and attitudes towards their placement and impact on their future career plans. The detailed methods for study components (i) and (ii) are reported elsewhere [13]. Quantitative and qualitative data from (iii) follow-up surveys—one- and three-year surveys, are reported on in this paper.

Follow-Up Survey

Links to online surveys (Survey Monkey®) were distributed via email to consenting participants at one and three years post-graduation. Reminders and links to the survey were also given via the UONDRH Facebook® page. The survey questions were based on the NSW Rural Allied Health Workforce Survey [22]. Qualitative and quantitative data was collected regarding; demographic information, employment data and current position details including employment location, type of position and workplace postcode. A range of open ended questions allowed for comments regarding 'placement influence on current position choice' and 'reasons for leaving/planning to leave positions'. The Australian Standard Geographical Classification Remoteness Area (SGC-RA) index [24] was used

to classify locations as Major Cities (RA1), Inner Regional (RA2), Outer Regional (RA3) or Remote–Very Remote (RA4–RA5).

2.3. Analysis

De-identified data was entered into Statistical Package for Social Sciences (SPSS, version 24 (IBM Corp.: New York, NY, USA). Chi-square analysis was performed on categorical variables (such as background location, placement length, years based rural and position type categories) and Fishers exact test was used where expected cell counts were less than five. Independent *t*-tests performed on continuous variables. The significance level was a *p* value less than 0.05. Odds ratios (OR) was calculated for particular variables, together with 95% confidence intervals (CI).

Qualitative responses regarding ‘reasons for intending to leave or stay in their current position’ were coded by two researchers using qualitative content analysis as described by Sandelowski [25,26] and developed into descriptive themes.

3. Results

3.1. Participation and Response Rates

A total of 404 eligible students participated in the program between 2011 and 2014. Of those graduating in the time period (2012–2015), 269 were invited to participate, 233 consented to the follow-up surveys. As of the end of 2015, 129 graduates had completed the 1-year follow-up survey (55.4% response rate) (refer to Table 1).

Table 1. Allied Health graduate position data at one and three years post-graduation, from 2012–2015 graduates.

Position Data	2012–2015	
	1-Year Follow-Up (<i>n</i> = 129)	3-Year Follow-Up (<i>n</i> = 24)
	<i>n</i> (%)	<i>n</i> (%)
Proportion employed in health profession ^		
At any time in the past year	114 (88.4)	22 (91.7)
At time of survey	111 (86.0)	22 (91.7)
Proportion currently employed, per discipline ^a		
Diagnostic Radiographer	16/18 (88.89)	5/6 (83.33)
Dietitian	25/34 (73.53)	6/7 (85.71)
Occupational Therapist	7/8 (87.50)	0
Physiotherapist	34/37 (91.90)	8/8 (100)
Nuclear Medicine Scientist	3/5 (60.00)	1/1 (100)
Speech Pathologist	24/25 (96.00)	2/2 (100)
Radiation Therapist	2/2 (100.00)	0
Position type (employed at any time this year)		
Salaried employee	96 (74.4)	15 (62.5)
Self-employed	8 (6.2)	1 (4.2)
Locum	6 (4.7)	4 (16.7)
Not answered	1 (0.7)	2 (8.3)
Not employed in profession	18 (14.0)	2 (8.3)
Full-time	84 (65.1)	14 (58.3)
Part-time	16 (12.4)	5 (20.8)
Casual	10 (7.8)	1 (4.2)
Not answered	1 (0.7)	2 (8.3)
Not employed in profession	18 (14.0)	2 (8.3)
Permanent	50 (38.8)	12 (50.0)
Temporary	60 (46.5)	8 (33.3)
Not answered	1 (0.7)	2 (8.3)
Not employed in profession	18 (14.0)	2 (8.3)

Table 1. Cont.

Position Data	2012–2015	
	1-Year Follow-Up (<i>n</i> = 129)	3-Year Follow-Up (<i>n</i> = 24)
	<i>n</i> (%)	<i>n</i> (%)
Sole Practitioner role		
Always	10 (7.8)	2 (8.3)
Often	10 (7.8)	2 (8.3)
Sometimes	14 (10.9)	6 (25.0)
Rarely	18 (14.0)	2 (8.3)
Never	58 (45.0)	8 (33.3)
Not answered	1 (0.7)	2 (8.3)
Not employed in profession	18 (14.0)	2 (8.3)
Size of community where employed		
A Capital City	16 (12.4)	7 (29.2)
Other Metropolitan (population 100,000)	38 (29.5)	5 (20.8)
Large Rural Centre (25,000–99,000)	32 (24.8)	5 (20.8)
Small Rural Centre (10,000–24,999)	19 (14.7)	2 (8.3)
Other Rural Area (<10,000)	4 (3.1)	1 (4.2)
Remote Centre (5000–9999)	1 (0.7)	0
Not answered	1 (0.7)	2 (8.3)
Not employed in profession	18 (14.0)	2 (8.3)
Geographical location of position, by ASGC-RA		
Major Cities—RA1	42 (32.6)	11 (45.8)
Inner Regional—RA2	46 (35.7)	6 (25.0)
Outer Regional—RA3	19 (14.7)	3 (12.5)
Remote/Very Remote—RA4 to RA5	2 (1.6)	0
Not answered/invalid postcode	2 (1.6)	2 (8.3)
Not employed in profession	18 (14.0)	2 (8.3)
Length of time in current position		
Less than 3 months	8 (6.2)	2 (8.3)
3–6 months	14 (10.9)	1 (4.2)
7–12 months	49 (38.0)	2 (8.3)
More than 12 months	37 (28.7)	13 (54.2)
Not answered	3 (2.3)	4 (16.7)
Not employed in profession	18 (14.0)	2 (8.3)

Notes: ASGC = Australian Standard Geographical Classification; RA = Remoteness Area. Percentages are for column totals for each variable unless otherwise stated. Percentages may not add up to 100 due to rounding. ^a Percentages of totals in each row, for each survey; [^] Employment in health profession as per self-report, not by position title.

3.2. Graduate Positions Post-Graduation after One and Three Years

Follow-up surveys of graduates at one year (*n* = 129) and three years (*n* = 24) post-graduation have been completed for 2012 to 2015 graduates. Table 1 provides details regarding graduate position data. At the time of the survey, according to respondents, the majority of graduates were employed within their health profession at both one year (86%) and three years (91.7%) post-graduation. The proportion of graduates working in a rural or remote areas (RA2–RA5) was at 52% after one year and 37.5% at three years post-graduation.

One year after graduation, the majority of graduates were working as salaried employees (74.4%) and more than half (65.1%) were working full-time, however most (46.5%) were in a temporary role. Just over 15% reported to be ‘always’ or ‘often’ working in a sole position and only a small proportion (6.2%) were self-employed. The majority (66.7% at one year and 62.5% at three years) had been employed in their current role for seven months or more.

3.3. New Graduate Workplace Location and Associated Variables

For those respondents who were employed at the time of survey, comparisons of the proportion employed in a metropolitan location versus those in a rural or remote location were made using a number of variables thought to be associated with rural workplace outcomes (refer to Table 2). There was a significant difference between workplace locations with respect to rural background status. Students with a rural or remote background were 2.35 times more likely to be located in a rural or remote workplace at one year than graduates from a metropolitan background (95% CI 1.056–5.229). Workplace location at one year did not appear to be associated with placement length and there was no observed effect when controlling for background.

Table 2. Graduate workplace location (1 year post-graduation) and associated variables.

Variable	Workplace Location (<i>n</i> = 109)		<i>p</i> Value
	City/Metro (RA1)	Rural/Remote (RA2–5)	
	(<i>n</i> = 42)	(<i>n</i> = 67)	(χ^2 Test)
Background category			
City /Metropolitan	21 (51.2)	20 (48.8)	0.035
Rural/Remote	21 (30.9)	47 (69.1)	
Mean (SD) years in rural location			
By home address	8.17 (8.112)	12.85 (7.624)	0.030
By schooling	5.88 (5.960)	8.56 (5.721)	0.021
Placement length			
Placement shorter than 18 weeks (<i>n</i> = 67)	26 (38.8)	41 (61.2)	0.941
Placement longer than 18 weeks (<i>n</i> = 42)	16 (38.1)	26 (61.9)	
City/Metropolitan background (<i>n</i> = 41)			
Short Placement	13 (44.8)	16 (55.2)	0.203
Long Placement	8 (66.7)	4 (33.3)	
Rural/Remote background (<i>n</i> = 68)			
Short Placement	13 (34.2)	25 (65.8)	0.504
Long Placement	8 (26.7)	22 (73.3)	
Age			
Mean age (SD)	24.79 (4.877)	24.49 (2.391)	0.711 *
Proportion employed at each workplace location, by discipline			
Diagnostic Radiographer	7 (43.7)	9 (56.3)	§
Dietitian	8 (32.0)	17 (68.0)	
Occupational Therapist	2 (28.6)	5 (71.4)	
Physiotherapist	14 (41.2)	20 (58.8)	
Nuclear Medicine Scientist	1 (33.3)	2 (66.7)	
Speech Pathologist	9 (40.9)	13 (59.1)	
Radiation Therapist	1 (50.0)	1 (50.0)	
Proportion employed at each workplace location, by discipline ¹			
Dietitian	8 (32.0)	17 (68.0)	0.900
Occupational Therapist	2 (28.6)	5 (71.4)	
Physiotherapist	14 (41.2)	20 (58.8)	
Speech Pathologist	9 (40.9)	13 (59.1)	
Medical Radiation Sciences ^	9 (42.9)	12 (50.0)	
Position type ²			
Permanent	16 (38.1)	33 (49.3)	0.254
Temporary	26 (61.9)	34 (50.7)	
Acting in sole practitioner role ²			
Always/Often	4 (9.5)	16 (23.9)	0.094
Sometimes	4 (9.5)	10 (14.9)	
Rarely /Never	34 (81)	41 (61.2)	
Level of satisfaction with the job ²			
Mean rating ^a (SD)	2.55 (1.214)	2.39 (1.154)	0.498 *

Table 2. Cont.

Variable	Workplace Location (<i>n</i> = 109)		<i>p</i> Value	
	City/Metro (RA1)	Rural/Remote (RA2–5)		
		(<i>n</i> = 42)	(<i>n</i> = 67)	(χ^2 Test)
Reasons for choosing job ²				
Work/life balance	21 (50.0)	33 (49.3)	0.940	
Income	14 (33.3)	17 (50.7)	0.370	
Career advancement	27 (64.3)	31 (46.3)	0.078	
Type of work/clients	19 (45.2)	35 (52.2)	0.477	
Previous rural placement in this area	0	16 (23.9)	0.001	
I come from the area	9 (21.4)	16 (23.9)	0.767	
Marriage/partner	5 (11.9)	8 (11.9)	0.996	
Good place to raise kids	2 (4.8)	3 (4.5)	0.945	
Family social attachments	13 (31.0)	16 (23.9)	0.416	
Climate/location	10 (23.8)	15 (22.4)	0.864	
Housing affordability	1 (2.4)	3 (4.5)	0.571	
Cost of living	2 (4.8)	8 (11.9)	0.206	
Placement experience influenced decision to take up the position ²				
All	Yes	14 (33.3)	45 (66.2)	0.01
	No	28 (66.7)	22 (33.8)	
Metropolitan background	Yes	4 (21.1)	15 (78.9)	<0.01
	No	17 (77.3)	5 (22.7)	
Rural/Remote background	Yes	10 (25.0)	30 (75.0)	0.21
	No	11 (37.9)	17 (25.0)	

Notes: RA = Remoteness Area; SD—Standard Deviation. Percentages of row totals unless otherwise stated. Percentages may not add up to 100 due to rounding. ¹ Row percentage in each workplace location; ² Column percentages in each workplace location; ^a Rating scale was 1–5: 1 = extremely satisfied to 5 = extremely dissatisfied. [^] Medical Radiation Science is a collective term that includes the disciplines Diagnostic Radiography, Radiation Therapy and Nuclear Medicine Scientist) * Independent groups *t*-test; [§] No statistical comparison since expected counts for 6 cells (42.9%) are less than 5.

Notably, 64.3% of those working in a metropolitan location cited *career advancement* as a reason for choosing the position compared to 46.3% of those in a rural or remote location, however this was not statistically significant (refer to Table 3). Almost 24% of graduates working in a rural or remote location cited a *previous rural placement in the area* as a reason for choosing their current position. Interestingly there was a highly significant difference ($p < 0.01$) between the proportion of graduates from a metropolitan background who were influenced to take up their current position by their rural placement. Of the graduates from a metropolitan background who were influenced by their rural placement when deciding to take up their current employment, 15 (79%, $n = 19$) had chosen a rural or remote location, while four (21%) had chosen a metropolitan location. Graduates in a rural or remote workplace were working more often (*always/often*) in a sole practitioner role than those in metropolitan areas (23.9% compared to 9.5%), however this was not statistically significant. No difference was observed in job satisfaction between the workplace locations.

Table 3 summarizes quantitative data relating to graduate intention to leave or stay in positions and their reasons for leaving. The majority of graduates were planning to leave their position within two years (or had already left), regardless of their location being metropolitan (66.7%) or rural/remote (59.7%). For rural based graduates, the top three responses given for leaving were: (1) better career prospects; (2) moving to a preferred location and (3) contract or temporary position. For metropolitan based graduates, the top three reasons were: (1) moving to a preferred location; (2) better career prospects and equally (3) never intended to stay, to earn a better income and relocation of partner. The only factor significantly different between the metropolitan and rural based graduates was the relocation of partner.

Table 3. Plans to leave or stay in position and reasons for changing jobs by current workplace location at Year 1.

Variable	Workplace Location (<i>n</i> = 109)		<i>p</i> Value
	City/Metro (RA1)	Rural/Remote (RA2–5)	
	(<i>n</i> = 42)	(<i>n</i> = 67)	(χ^2 Test)
Proportion in workplace location planning to leave or stay			
Already left position or plan to leave within next 2 years	28 (66.7)	40 (59.7)	0.282
Plan to leave after 2 years	3 (7.1)	12 (17.9)	
No plans to leave	11 (26.2)	15 (22.4)	
Reasons for planning to leave job			
To earn a better income	9 (21.4)	10 (14.7)	0.384
Better career prospects	11 (26.2)	21 (30.9)	0.565
Relocation of partner	9 (21.4)	3 (4.5)	0.010 *
Moving to a preferred location	16 (38.1)	20 (29.4)	0.373
Never intended to stay	9 (21.4)	11 (16.2)	0.511
Contract or temporary position	6 (14.3)	12 (19.1)	0.620
Family and convenience	1 (2.4)	1 (1.5)	\$
Overseas travel/work	3 (7.1)	6 (8.8)	\$
Experience other locations	0 (0)	3 (4.4)	\$
Education/training	0 (0)	1 (1.5)	\$
Minimising time spent completing shift work	0 (0)	1 (1.5)	\$
Secure income—salary	0 (0)	1 (1.5)	\$

Notes: Percentages of column totals (workplace location) for each variable. Percentages may not add up to 100 due to rounding. * Fisher's Exact Test; § No valid statistical comparison as counts for at least one cell are too low.

3.4. Plans to Relocate from Current Location—Qualitative Data, One Year Post-Graduation

Graduates were asked to provide a more detailed explanation if they planned to move away from (or stay in) their current metropolitan, rural or remote work location. These reasons were thematically analysed and grouped into four key themes: Seeking new and different opportunities; Better income and job security; Personal change and lifestyle improvement and Level of job satisfaction.

3.4.1. Seeking New and Different Opportunities

Recent graduates expressed the importance of seeking different opportunities and experiences elsewhere, not necessarily in metropolitan areas but in order to broaden their skills and knowledge. By trying a variety of roles in a range of settings, new graduates could see the benefits of working in a variety of positions and had given consideration to working in remote areas of Australia and overseas.

"I think it is important to try a variety of positions following graduation before I settle into one long term, so I can extend and develop my skills and knowledge across a range of areas." (rural/remote based graduate, occupational therapy, plan to relocate in 2 years)

"I would like to travel overseas or go and work in other areas of Australia like the Northern Territory." (metropolitan based graduate, occupational therapy, plan to relocate in 2 years)

A metropolitan based graduate was interested in exploring locum work in small rural communities, but felt they needed more metropolitan experience before they could consider this option.

"I want to do locum work in smaller rural communities throughout Australia, once I get enough post graduate experience." (metropolitan based graduate, diagnostic radiography, plan to relocate in 2 years)

"The hospital provides excellent training opportunities. I would like to be a successful multi-modality trained radiographer before moving to a smaller rural centre." (rural/remote based graduate, diagnostic radiography, plan to relocate in 5 years)

Some graduates were looking for work in other locations for perceived improvement in access to professional development and resources to better support them clinically and to provide further work opportunities.

“Whilst I enjoy the rural lifestyle and experience. As a new graduate, I am limited with opportunities to further my career. I am also restricted in the amount of professional development I have access to, and clinical support. I am moving somewhere where they have the resources to provide me with better support and opportunities.” (rural/remote based graduate, physiotherapy, plan to relocate in 2 years)

3.4.2. Better Income and Job Security

Many new graduates were in part-time or locum positions and a key driver for considering relocation was the opportunity to find a longer-term or permanent position.

“Lack of regular funding means there may not be enough money to continue funding my position in the long-term.” (rural/remote based graduate, speech pathology, plan to relocate in 2 years)

“I would like full-time work and there is no opportunity for that at my current workplace.” (metropolitan based graduate, nutrition and dietetics, plan to relocate in 2 years)

Some expressed a desire to stay in their rural location, if only funding of their position would allow for this.

“I currently only have another six months on my contract. I would stay longer if the position were to be extended.” (rural/remote based graduate, nutrition and dietetics, plan to relocate in 2 years)

“I have a traineeship that finishes in two years. No job after that, as my position is for a fixed period of 12 months, however if I was to be offered a full-time position I would accept and would then have no plans to leave.” (rural/remote based graduate, nuclear medicine scientist, plan to relocate in 2 years)

Graduates were attracted to roles that had potential for ongoing funding and offered paid leave, something that was not always available in the private sector where commissioned based work was common.

“I would ideally like to get a job in a government funded or full-time position that offers paid leave, rather than the commissioned based private practice.” (rural/remote based graduate, physiotherapy, plan to relocate in 2 years)

3.4.3. Personal Change and Lifestyle Improvement

Consideration of a partners' employment opportunities and a suitable location to raise a family were also mentioned by graduates, who indicated that they might choose their location based on a partner's job opportunities or if they considered it a better location to raise a family.

“I will move closer to my partner at some stage as they seek different employment opportunities, but I am hoping to stay working regionally or rurally.” (rural/remote based graduate, physiotherapy, plan to relocate in 2 years)

“I thoroughly enjoy my current job, however at the moment I see myself returning to a more rural area down the track to raise a family.” (metropolitan based graduate, nutrition and dietetics, plan relocate in 5 year)

As reported by a graduate living and working in a metropolitan area, the cost of living and poor work-life balance as key reason for planning to relocate to a rural area. Even aspects of the physical environment, (i.e., a lack of trees) was expressed as a reason to relocate.

“Living in a capital city is too expensive to survive! My work/life balance is not enjoyable. I miss trees.” (metropolitan based graduate, radiation therapy, plan to relocate in 2 years)

Another graduate expressed an openness to consider career opportunities in rural areas and be open to change without any expressed constraints.

“I am open to see where my career takes me.” (rural/remote based graduate, speech pathology, no plans to leave)

Another graduate was open about the temporary nature of their work plans one year post-graduation, with their first job seen as an opportunity to start their career and ‘plan their next move’ and for others to move to a more specialised role.

“It was never a permanent move, just long enough to start my career and plan my next move.” (rural/remote based graduate, diagnostic radiography, plan to relocate in 2 years)

“... want to get into paediatrics, so will probably have to move to get the experience.” (metropolitan based graduate, physiotherapy, plan to relocate in 2 years)

Some graduates could see the benefits of self-employment and capacity for growth in allied health service demands in their rural communities, providing them with potential for ongoing employment and therefore plans to stay in their current location.

“[I] enjoy all aspects of working for myself.” (rural/remote based graduate, nutrition and dietetics, no plans to leave)

“I hope to regain employment when my contract finishes as the region has good capacity for growth.” (rural/remote based graduate, physiotherapy, no plans to leave)

3.4.4. Level of Job Satisfaction

Some graduates were dissatisfied with aspects of their current position or employment, particularly in relation to issues seen as poor management or challenging institutional processes.

“My boss is extremely unorganised, trying to organise time off is a nightmare unless you are [in a] senior [role]. I also feel it is not on a first apply, first granted basis. I also feel my boss is unapproachable.” (rural/remote based graduate, diagnostic radiography, plan to relocate in 2 years)

Regardless of their work location, job satisfaction was typically linked to three key factors, which were: being positive about the job itself; the people they worked with; and the clients to whom they provided services.

“I enjoy working with my colleagues.” (rural/remote based graduate, physiotherapy, no plans to leave)

“I enjoy it and I like the location and the people.” (rural/remote based graduate, physiotherapy, no plans to leave)

“I like the way the hospital works, together with all allied health professionals and all hospital staff.” (rural/remote based graduate, diagnostic radiography, no plans to leave)

“I enjoy my job and the clients I see.” (metropolitan based graduate, physiotherapy, no plans to leave)

“It’s flexible and I enjoy the workload and helping people in a low socioeconomic area.”
(metropolitan based graduate, speech pathology, plan to relocate in 10 years)

“Fantastic job and training opportunities.” (metropolitan based graduate, diagnostic radiography, no plans to leave)

4. Discussion

This study is the first of its kind to report on the workforce outcomes in rural and remote Australia for allied health graduates who have been involved in short- and long-term rural immersive placement programs. This paper provides some preliminary data relating to workforce outcomes one to three years post-graduation. Key findings from this study suggest that rural-based practice education for health professional students has a positive impact on rural return in the first one to three years post-graduation, with approximately half of the graduates working in rural or remote settings in the first year after graduation. While the proportion of graduates based in rural or remote locations was lower at three years, the number of graduates followed-up at this time point is small at this stage of the longitudinal study. Intention to stay in rural or remote locations (or return to rural and remote locations) was found to be impacted on by a range of factors including personal or lifestyle factors, work opportunities and aspects of job satisfaction. Similar extrinsic (poor access to professional development, family nearby, rural lifestyle) and intrinsic (flexibility, community connectedness, autonomy) [18] factors have previously been identified in the literature. Our study provides further insight into the complexities of these factors and suggests that workplace outcomes should be monitored in the longer-term to gauge eventual workplace outcomes. The study does not, however, provide insight into the availability of positions for graduates, which may vary across disciplines, regions and over time. It is recommended that future research could address job availability as a variable, with data sources including employers and employee perspectives.

As in the medical literature [9–12], this study found that students with a rural or remote background were more likely to be located in a rural or remote workplace, 2.350 times more likely than graduates from a metropolitan background, (95% CI 1.056–5.229). This is similar to findings from other rural training programs which have found that graduates from a rural background were more likely to enter rural practice (OR 2.30, 95% CI = 1.57–3.36). In our study, the 95% CI for the odds ratio of rural practice given rural background is somewhat broader than in a comparable study which is likely to reflect the variable nature of rural positions available between disciplines. Importantly, in our findings there was a significant difference ($p < 0.01$) between the proportion of graduates from a metropolitan background who were influenced to take up their current position by their rural placement experience. Of the graduates from a metropolitan background who were influenced by their rural placement, 79% had chosen a rural or remote location when deciding to take up their current employment. This highlights an important finding, that even though rural background has been strongly linked to future rural employment [9–12], the impact of rural-based education on those from a metropolitan background should not be overlooked as an important source for the future rural workforce, particularly if longer-term outcomes are tracked. We found that 52% of graduates were working in rural or remote locations after one year, which compares favorably with previous data from the Australian Graduate Survey. The proportion of graduates from the UON, in the allied health disciplines under study, employed in a rural or remote location was 23.7% overall one year after graduation [13]. While this data cannot be analyzed by rural placement exposure, it provides some comparative data.

While the numbers of new graduates entering self-employment in this study are small (6.2% at one year), it is not known how many may have been employed in salaried private sector roles. Health workforce data in Australia has indicated a growth in the private sector [27], with existing public health services facing ongoing challenges in meeting growing and complex population needs and limited growth in public sector positions [28,29]. While private practice has been seen as an opportunity area for workforce growth [30] in rural areas, there are concerns about new graduates taking on private

practice or sole positions [28] given their need to continue to meet proficiency in their profession beyond the entry-level competency achieved at the point of graduation.

In terms of quantitative data, *better job prospects* and *moving to a better location* were given as key reasons for leaving positions. However, when the qualitative data was explored, the factors identified in graduate plans to move from (or stay in) their current position highlight the complexity and changeability of these factors with life-stage and personal priorities that factored in the key themes identified. The decision to stay or leave rural or remote areas were multi-factorial and location was not the only priority, particularly if other key priorities were achievable. The challenges of family commitments, partner employment and ongoing employment were found to impact on work location choices and these factors could override location preferences, particularly when new graduates were seeking experience to set them up for the rest of their career.

The temporary nature of positions obtained by new graduates in their first few years of work was also a key driver for seeking work elsewhere. The lower proportion of graduates located in rural and remote areas after three years may be due to the temporary nature of their initial employment, with new graduates often finding temporary and contract work in the first instance, as they seek more permanent and varied employment. The desire to expand horizons and experience different types of work in different settings was a driver for new graduates to seek employment elsewhere. There was a range of perceptions about how to further develop professional knowledge and skills with some graduates seeking exposure to international, metropolitan or specialist work and others seeking exposure to varied rural and remote communities. While wanting better access to professional development and professional support was identified in the rural and remote settings, graduates were also positive about rural training opportunities, and quantitative data did not suggest that this was a common issue across rural and remote areas.

In order to further develop the allied health workforce in rural and remote areas to meet population needs now and into the future, there is genuine need to look to creative practice models [4,19,31] and ways to entice graduates to stay or come back to a rural or remote areas [18,19]. Reasons for leaving may be short-term and potential to return exists if there are opportunities that meet employee needs. While rural placement exposure was not found to be significantly linked to workplace location after one year, our previous analysis has suggested that rural exposure is leading to improved intention to work rurally [13] and that there may be longer-term benefits through future return to rural practice. Campbell et al. [18] identified a need for health workforce policies to address both the extrinsic and intrinsic motivation incentives to improve the recruitment and retention of allied health professionals in rural areas.

There are a number of limitations to be noted for this study. The number of graduates followed up at three years is currently small ($n = 24$) at the current stage of longitudinal follow-up, however this current data analysis has focused on the quantitative outcomes at one year post-graduation ($n = 129$). It should be noted that data has been obtained from students who consented to participate in the study and those who provided consent may be more likely to be favorable to entering rural practice. Data obtained from the follow-up surveys has yet to elucidate more specific details about the types of practice new graduates are entering into such as salaried private practice or other private sector roles. A strength of this research however is the mixed-methods data analysis which incorporates qualitative data to provide a more in-depth analysis of the factors contributing to intention to leave or stay in a location in the short- to medium-term, which has highlighted the complexity and changeability of these factors.

5. Conclusions

Early indications are positive for the ongoing development of the rural allied health workforce in the Australian setting given the short-term outcomes to date from one workforce development initiative in rural Australia. Ongoing monitoring of the workforce outcomes from allied health

workforce programs can assist in the future development of a health workforce supply to better fit future population health needs.

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