Investigating first-year graduate paramedics reason for current work location: a cross-sectional, data linkage study.

Short title: Paramedic graduate work location: why?

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Investigating first-year graduate paramedics' reasons for current work location: a cross-sectional, data linkage study.

Abstract

Background

Paramedics are an essential part of the health workforce throughout Australia, yet little is known about the factors impacting where they choose to practice after graduation. Despite evidence indicating a shortage of paramedics in rural areas, no identified studies describe the personal and professional factors influencing rural practice.

Objective

This study aims to describe the demographic and employment characteristics of first year graduates from a Victorian based paramedicine course, and investigate factors that influenced their choice in place of practice.

Design

Cross-sectional study using data from the Nursing and Allied Health Graduate Outcomes Tracking study.

Setting

Victoria, Australia.

Participants

First-year graduates (2019) from the Monash University range of paramedicine programs.

Main outcome measure

Variables of interest included principal place of practice (PPP) and the reasons for working in the current location.

Results

Over half (61.7%, n=71) of 2018 paramedicine course graduates (n=115) responded to the 2019 Graduate Outcomes Survey. A majority (91.5%) were registered as paramedics (including double registrants as nurses), and over a fifth (21.1%) were from a rural background; however, only 19.7% were working in a rural area. Of those with complete data (n=36; 50.7%), the most cited reasons for current work location were 'spouse/partner's employment or career' (43.8%), 'opportunity for career advancement' (50.0%), and 'scope of practice within the role' (31.3%).

Conclusion

This study provides important insight into the factors associated with rural practice location amongst paramedicine graduates, specifically rural origin and/or personal, lifestyle, and professional influences. The study adds to the sparse literature about paramedic practice location decision-making and highlights the need for further systematic longitudinal research examining the 'where' and 'why'.

Keywords: ambulance, emergency, pre-hospital care, recruitment and retention, rural/remote services

Boxed lists

What this paper adds:

- Highlights the demographic and employment characteristics of first-year paramedicine graduates.
- Provides preliminary insights into early career paramedics' choice of practice location, going beyond existing research which is limited to the practice location intentions of paramedicine students.
- Opportunity for career advancement, spouse/partner's employment or career, and scope of practice within the role are the three most frequently reported reasons why graduates were working in their current location.

What is already known on the subject:

- Inequitable distribution of the health workforce contributes to poorer health outcomes in rural locations.
- Work location decision-making has been explored extensively in the medical workforce, less so in nursing and allied health workforces, and remains largely unexplored among paramedics.
- The allied health and nursing professions make up a larger part of the health workforce compared to medicine; hence, more investigation of this workforce is warranted.

Investigating first-year graduate paramedics' reasons for current work location: a cross-sectional, data linkage study.

Introduction

There is a greater prevalence and burden of disease in rural Australia, including higher rates of chronic disease and mental illness.[1,2] Ensuring an adequate health workforce for rural areas is essential to achieving improved health outcomes.[1] However, in many rural and regional areas of Australia, there is a shortage of health professionals[3], including paramedics.[1] This may impact on timely and equitable access to health care for populations at greater need.[4]

The benefits of ensuring an adequate registered paramedic workforce in rural Australia are many, and not only include improved access to health care but also include opportunities to expand and extend the 'traditional' role of paramedicine to one with greater community care and health-promoting focus.[5] Preliminary work has shown that extended paramedics or paramedic practitioners may have a positive influence on rural health in Australia[6,7] and internationally.[8] In many areas of rural Australia, there is also a continuing dependence on volunteer staff for adequate ambulance services[2] and medical professionals who work in emergency health roles to fill local gaps in urgent care services.[1] Given the unique needs of rural and regional Australia, it is vital to understand the factors that influence paramedicine graduates' decisions to work in these locations if we are to ensure that the workforce meets these needs.

However, despite the evidence indicating a shortage of registered paramedics in rural areas, no identified studies outline the personal and professional factors influencing rural practice for this profession. Shortages in the rural health workforce more broadly result from both recruitment and retention issues.[1] Knowledge of the factors that underpin how graduates obtain employment in rural areas and why they stay in a particular location would allow for workplace strategies to be optimised for paramedics at both local and jurisdictional levels, and may ultimately lead to better health outcomes for rural Australians.

Studies from health professions other than paramedicine have outlined the influence of various factors on graduate work location. The literature reports strong evidence for the positive impact of rural background,[9,10] rural education,[11,12] rural placements,[11,13,14] and mentorship[9,15] towards promoting rural practice among medical, nursing, and allied health

graduates. In one Australian study, allied health graduates of rural origin were 2.4 times more likely to be practicing in a rural location one year after graduating than those of a metropolitan background.[10] Similar findings were demonstrated in another Australian study in which 56.7% of nursing and allied health graduates working in a rural location were from a rural background and 84.1% had at least one rural placement during their study.[13] Although neither of these studies included paramedics, O'Meara et al. report that personal factors (such as family and friends) are a common influencing factor amongst paramedic students in New South Wales, Australia.[16] However, literature relating to these topics within paramedicine is sparse.

This project formed part of the Nursing and Allied Health Graduate Outcomes Tracking (NAHGOT) study, which aims to understand the factors that predict practice location amongst nursing, midwifery, and allied health discipline students.[17] NAHGOT utilises data linkage to combine data from university enrolment, Australian Health Practitioner Regulation Agency (Ahpra), and both student and graduate surveys. The present study aimed to address the gap within the paramedicine literature by examining the personal, lifestyle, and professional factors which influence a graduate's choice of practice location. Hence, the research question is 'what are the personal, lifestyle, and professional factors that influence new graduate paramedics' current working location?'

Methods

Study design

This cross-sectional study uses data collected as part of the NAHGOT study.

Participants and data sources

The sample comprised graduates from Monash University's range of paramedicine programs in Victoria, Australia. The paramedicine program encompasses entry-level and specialist practice degrees: Bachelor of Emergency Health/Paramedicine (a combination of other similar degrees, see data analysis), Bachelor of Nursing and Emergency Health/Paramedicine, and Masters in Emergency Health. The sample was limited to paramedics who had completed any of the Monash University programs in paramedicine, were in their first year of graduate practice in 2019, and had registered with Ahpra by 31st May 2019.

Three data sources were used: first, student administrative data routinely collected by the university at the commencement of each course. These data include student demographic data, home address, secondary school location, type of degree, and course completion dates. Second, publicly available Ahpra data pertaining to the location of current

employment, based on the Australian Statistical Geography Standard – Remoteness area (ASGS-RA) geographical classification of Australian areas.[18] Third, the Graduate Outcome Survey (GOS), which is administered on behalf of the Australian Government Department of Education, Skills and Employment to assess higher education for quality improvement.[19] The GOS is routinely administered annually to first- and third-year graduates by all Australian universities. NAHGOT study questions about graduate employment characteristics and reasons why individuals are working in their current location were incorporated into the GOS. Additional demographic data were also extracted from the GOS.

Paramedicine student administrative data were extracted from university data systems, graduate workplace location was extracted from Ahpra using the "Online Services; Employer" function, and GOS data were provided by Monash University Planning and Statistics Department. All data were extracted and de-identified by the NAHGOT data manager using an algorithm that is routinely applied to all NAHGOT data, creating a unique NAHGOT ID for each participant. Deterministic data linkage[20,21] for these data sources was undertaken using the NAHGOT ID as the linkage key.

Data analysis

Data pertaining to geographical areas in this study were dichotomised as metropolitan or rural, based on the ASGS-RA classification.[18] The ASGS-RA stratifies remoteness by accessibility to services or goods from RA1-5. In this study, 'rural', unless otherwise specified, refers to non-metropolitan settings (i.e. ASGS-RA 2-5). Graduates with home addresses on course enrolment in RA1 areas (Major cities) were classified as metropolitan origin, whilst any students in areas RA2-5 (Inner regional, Outer regional, Remote, Very remote) were grouped as a rural origin. If a graduate's home address was unavailable, the address of their secondary school was used. The same classification was utilised for defining the location of a graduate's principal place of practice from the Ahpra data.

Demographic data for all participants were described as follows: gender (male or female), age at course commencement (<21 or ≥21 years), rural background (yes or no), degree type, country of birth (Australian or other), language spoken at home (English or other), and citizenship/residency status (domestic citizenship/residence or other). The former three were acquired from the university administrative data, and the latter four from the GOS. Age was initially reported as a continuous variable, and was collapsed into a binary variable for analysis (<21 or ≥21 years), where ≥21 years are considered 'mature age' entrants into

Australian universities.[22] Degree type was split into three groups: first, Bachelor of Emergency Health/Paramedicine, encompassing Bachelor of Emergency Health (Paramedic), Bachelor of Emergency Health/Paramedic (Honours), and Bachelor of Emergency Health and Paramedic Practice; secondly, Bachelor of Nursing and Emergency Health/Paramedicine, and lastly; Master of Emergency Health. Ahpra data related to graduates' principal place of practice were registration status and the ASGS-RA code for their current workplace (defined as rural or metropolitan).

To reflect the aims of this study, data relating to employment characteristics and reasons for current practice location are shown for paramedics only, including double registrants (i.e. graduates registered as nurses only were excluded from this analysis). Employment characteristics included whether a participant worked in the last week, were working more than one job, or preferred to work more hours (all as yes/no). Usual hours worked per week and the number of hours preferred to work were continuous. Questions relating to the reason for not working more hours and the source of their current job were reported as multiple-choice questions. Response options for the former question included no suitable job available or no more hours available. The latter included Internet or social media, family, friends, or work networks, or graduate program or internship.

NAHGOT-included questions in the GOS focused on reasons why individuals were working in their current location, with up to 16 response options available (see Figure 1). These categories (relationships, aspects of the geographical area, characteristics of the work position, previous location, and job acquisition) were based on categories described in the 2010 WHO report on rural health retention (Figure 2).[23] Participants were able to select more than one response. In addition, as binary responses, graduates were asked if they were working in the profession they had most recently qualified for and whether they were working in their preferred geographic location (Table 3).

Stata (Software for Statistics and Data Science, version 16[24]) was utilised for data manipulation and analysis. Descriptive analyses were used to report the data, with binary and categorical variables reported as sample proportions and continuous variables reported as mean values and standard deviation. Pearson's chi^2 squared analysis was used to compare the differences between demographic groups within each of the reasons why individuals were working in their current location , and resulting p-values were considered significant if <0.05.

Ethics approval

Ethics approval for the NAHGOT study was obtained through the Monash University Human Research Ethics Committee (MUHREC) August 2017 (MUHREC project ID: 7962, reference: 2020-7962-3954). The author was added to the ethics approval in October 2019.

Results

In total, university enrolment data were available for 115 paramedicine graduates who completed their course in 2018. Seventy-one (61.7%) of these graduates partially or fully completed the GOS survey. Data relating to demographics, study, and employment are presented in Table 1. A majority of graduates who completed the survey were female (54.3%), under 21 years of age at course commencement (52.1%), with a Bachelor of Emergency Health/Paramedicine (64.8%), and completed full-time study (70.4%). Nearly all (90.1%) were Australian-born, and all had an English-speaking background. Most were registered as paramedics (82.3%), 10.0% as both a paramedic and nurse, and the rest as nurses only (7.1%). Only 20% of graduates reported a rural PPP. However, this differed by the type of registration: 18.6% of those with a rural PPP were registered as paramedics only, and the remaining 1.4% were registered both as a paramedic and a nurse. No participants solely registered as a nurse reported a rural PPP.

Table 2 shows employment status and preferences for registered paramedics (including those registered as both nurses and paramedics, but excluding those registered as nurses only). Nearly all graduates in the sample (91.5%) were registered as paramedics and consequently completed the survey questions relating to employment status (n=65). A majority had worked in the past week (93.9%), averaging 36.2 hours per week (Table 2). Just under half (47.7%) were currently working more than one job. A total of 43.1% of graduates wanted to work more hours, with n=28 preferring to work an average of 44 hours per week, but 28.6% of those reported that no more hours were available (data not shown). For n=22 participants who answered the question regarding where their current job was found, 45.5% found their position through a graduate program or internship, and 22.7% found theirs through family, friends, or work networks.

Figure 1 highlights reasons as to why graduates were working in their current location, grouped into overarching categories: relationships, aspects of the geographical area, characteristics of the work position, previous location, and job acquisition. Survey respondents were able to choose multiple answers to this question. Of note, only 45.1% of the study's participants (registered paramedics, including double registrants) responded to this question (n=32), meaning that numbers were too small to stratify by rural vs metropolitan location.

Just under half of the respondents (43.8%) said their spouse or partner's employment/career was a reason for working in their current location. Of those aged >21 years at degree commencement, 92.9% chose this reason, compared to only 7.1% of those under 21 years ($p<0.001$ for difference between younger vs. older age group using Pearson's chi^2). Similarly, significantly more males (85.7%) than females (14.3%) also chose this reason ($p=0.003$). Options relating to the position's characteristics were frequently chosen (as shown in Figure 1), where 'opportunity for career advancement' was the most common reason, in this category and overall, for survey respondents (50.0%) to be working in their current location. Less than 10.0% of respondents chose 'good environment to raise children' or 'cost of accommodation/housing' as a reason for working in their current location. These two variables did not significantly differ by gender ($p=0.401$ and $p=0.198$, respectively) or age at degree commencement ($p=0.087$ and $p=0.170$, respectively).

Discussion

Studies from other health professions have outlined the influence of various factors on graduate work location,[9-15] while this study additionally focuses on the subjective influences on workplace choice. To the authors' best knowledge, this is the first study to examine these factors concerning paramedicine in Australia and seeks to illustrate the juxtaposition of factors between paramedicine and other health professions.

This study found that most respondents were practicing as paramedics, but not in their preferred geographical location. The three most frequent reasons for choice of current work location were opportunity for career advancement, spouse/partner's employment or career, and scope of practice within the role.

Graduates in the sample were more likely to be female, Australian-born, from a metropolitan background, and aged under 21 years at the commencement of their degree. The proportion of females in this study's sample (54.3%) is higher than that of Ahpra-registered paramedics (range 40.2-44.4%, from December 2018 to June 2020)[25] but is considerably lower than other allied health and nursing cohorts (66-83%).[26] This highlights that a preference for allied health disciplines amongst females exists, however, a majority of the Australian paramedic profession is male. Studying at a metropolitan-based university may indicate a positive association with a metropolitan background, as shown in this study's results. Likewise, universities with exclusively rural-based campuses have a higher rural student participation (Peter O'Meara PhD, written communication, February 2021).

Nearly half of the participants in the sample sought more hours and additional employment, despite working an average of 36.2 hours per week. This could reflect a perceived oversupply of paramedicine graduates, with minimal job positions available[27] or that their

current hours were not sufficient for financial comfort. These two reasons may also be why just under half of the participants (47.7%) were currently working more than one job. The small sample size in this study precluded analysis of this by rural or metropolitan workplace location, but this is an area for future research in paramedicine. Other reasons for holding multiple jobs, reported in an Australian workforce study, include income security, fluctuating hours, variety in work, skill up-keeping, and enjoyment.[28] In a study of over 18,000 United States emergency medical service personnel, 56.4% worked more than one job, and 71.1% depended on this or overtime hours for income security.[29] While salary rates and training vary considerably between the US and Australia, the results from this study and related literature nonetheless imply that the current working environment may not be economically satisfying for some graduates. Future strategies could focus on increasing financial gain in these positions or allowing for skill development to undertake more roles in the community to maintain job enjoyment. Specific to Australia, the large role of jurisdictional public ambulance services may have led to less recognition of other paramedicine work (Peter O'Meara PhD, written communication, February 2021). This is highlighted in the difficulty describing the role of industrial paramedics, who perform a variety of duties, similar to the extended paramedicine role, but at isolated sites and remote industry settings.[30] It is perhaps this variation in employment recognition that requires multiple job holding amongst participants in the sample. However, the present study was unable to discern whether an association was present between the employment sector and economic satisfaction or job insecurity; this is something further research could investigate.

The subjective nature of workplace choice is emphasised by the wide variety of factors discussed in the World Health Organisation's 2010 report on rural and remote workforce recruitment and retention (Figure 2).[23] As the figure demonstrates, there are countless possible combinations of factors influencing workplace choices, and hence, an individual's workplace location decision-making process is likely highly subjective.[23] Noted above, the influence of jurisdictional ambulance services in Australia may supersede many of these subjective factors. An example would be early career paramedics accepting positions in locations that may not be their preferred choice, due to fewer opportunities for less experienced graduates or to fill current workforce gaps. Further research could explore varying trends in workplace choice over time as paramedics reach different career stages, highlighting that influences to workplace choice at one-year post graduation may be less subjective than later in one's career.

However, this study did find that career advancement, scope of practice, and a spouse or partner's employment were common reasons for working in the current location, with the latter being more frequently chosen amongst those aged over 21 years at course

commencement. It is possible that older graduates were more likely to have spouses or partners whose employment also needed consideration when choosing a working location. A study of allied health graduates (excluding paramedics) found that 53.2% chose their current work location for 'career advancement'[10], which aligns with this study's results. In the same study, only 11.9% of participants described 'marriage/partner' as their reason. This is perhaps due to the lower mean age (approximately 24.5 years) of participants at one year after graduation,[10] compared to the approximate 26.4 years of this sample. In another study of 32 allied health students, 94% described 'career opportunities' as the top influencing factor for future rural practice.[31] The variation across studies highlights the subjectivity of factors which influence workplace choice.

A study by Campbell et al. identified that rural paramedics and midwives had higher correlation between procedural skills and relevance to their clinical practice, compared to doctors and nurses.[32] They hypothesised that this was in part to a narrower scope of practice for the former professions,[32] thus strategies that broaden this scope may be warranted. As mentioned previously, the expanded paramedic role allows specially trained paramedics to undertake a broader range of tasks to support the rural healthcare system.[7] The introduction of this extended role in providing out-of-hospital care allows patients to be redirected to the most appropriate service following clinical assessment by the paramedic,[6] leading to an overall reduction in hospital presentations[33] and decreased burden on health professionals, both in the community and hospital.[7] This role's potential expansion in rural areas allows for greater professional development and a wider scope of practice and may prove to be a factor that attracts paramedics to work in rural areas.

Limitations

This study involves data from paramedic graduates from a single metropolitan-based university, limiting the generalisability of the findings. Any missing data were presented separately and consequently excluded from proportion calculations. As the primary data collection method was a survey, the sample was opportunistically based and subject to selection bias. In addition, some survey items had low response rates; hence, the consequent sample would likely not be representative of the population; and as the survey data is self-reported, recall bias is a possibility.

Participant's current employment sector (public or private) was not linked in this study and may have been an influencing factor for some results, such as the reason for current work location or the reason for working more hours. The 'rural' origin of graduates was limited to the individual's address at university enrolment and does not consider previous living locations. Given the nature of the survey and that participants were first-year graduates, their

interpretation of reasons for working in the current location may be based on perceptions rather than personal experience. In addition, as data only was for registration of graduates, it was not discerned what profession double registrants were employed in. Hence, for this proportion of the sample, the results could be indicative of the nursing profession rather than paramedicine.

Lastly only one year of GOS data was utilised in this project, leading to a small sample size and limited sub-group analysis. An optimal study would encompass several university cohorts and multiple years of data.

Interpretation

This sample of paramedicine graduates from Monash University reported their spouse/partner's employment, the opportunity for career advancement, or the scope of practice within the role as influential to their current working location. Despite the younger age at degree commencement (mean 23.4 years), priorities may shift from oneself to significant others at this point in one's career. This was seen amongst 508 Australian paramedicine students, where 52.6% said that personal factors, such as family and friends, were the most common influence in their career intentions.[16] The focus of these factors became less apparent as students moved through their program, as third- and fourth- year paramedic students trended towards organisational factors whilst first-years' prioritised personal factors.[16]

As this study is the first of its kind, many questions have been raised along with those that were answered. Future research could expand the cohort to include paramedicine graduates from other universities, allowing for a more representative sample and sub-group analysis. As Ahpra registration for paramedics commenced in December 2018,[25] a longitudinal aspect for this study was not feasible at the time of writing; however, it could be considered in the future. This would allow for further investigation into how reasons for choosing a working location change over time.

Generalisability

Given the focused sample, the results can be generalised to similar paramedicine graduate cohorts, specifically those from metropolitan universities in Victoria, Australia. Loose extrapolation may allow relatability to other metropolitan universities around Australia; however, both location and personal demographics exert considerable influence on workplace location decision-making.

Conclusion

This study provides preliminary insight into the reasons first year paramedicine graduates choose where they work. This is the first study to link Ahpra paramedicine data with routinely collected student data and GOS data. The findings demonstrate the feasibility of the overall NAHGOT study to track paramedicine graduate outcomes to inform health workforce policy.

Though limited to a single university, the study suggests that recent Victorian paramedicine graduates are Australian-born females from a metropolitan location who commenced training when under 21 years of age, and are more likely to work in a metropolitan setting. Nearly two-fifths of graduates reported that they were working in their preferred geographical location, and cited three main reasons for their choice in work location: opportunity for career advancement, a spouse/partner's employment or career, and scope of practice within the role.

The results of this study aim to illustrate these influences and to promote further research into where and why paramedicine graduates choose to work where they do. Collaboration between universities and industry will aid in furthering our understanding about workplace location choice and help identify ways to address the inequitable distribution of the paramedicine workforce. Specifically, the findings suggest that strategies to increase the rural paramedic workforce should prioritise the advantages for career progression, an expanded role for paramedics, and the family benefits of moving to a rural location.

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Table 1: Demographic, study, and employment characteristics of included participants (n=71).

	n (%)	Missing data
Course name		
Bachelor of Emergency Health/Paramedicine[†]	46 (64.8)	-
Bachelor of Nursing and Bachelor of Emergency Health/Paramedicine	11 (15.5)	-
Master of Emergency Health	14 (19.7)	-
Demographics		
Female	38 (54.3)	1
Age in years at program commencement, mean [SD]	23.4 [6.6]	-
Age <21 years at program commencement	37 (52.1)	-
Rural background	15 (21.1)	-
Australian born	64 (90.1)	-
Domestic citizenship or residence status	70 (98.6)	-
English speaking background	71 (100.0)	-
Study characteristics		
Full-time study	50 (70.4)	-
Double degree	11 (15.5)	-
Current registration		
Registered as a paramedic only	58 (82.3)	1
With rural principal place of practice	13 (18.6)	
Registered as a nurse only	5 (7.1)	
With rural principal place of practice	0 (0.0)	
Registered as paramedic and nurse	7 (10.0)	
With rural principal place of practice	1 (1.4)	

[†]Combined: Bachelor of Emergency Health (Paramedic), Bachelor of Emergency Health (Paramedic) (Honours), and Bachelor of Emergency Health and Paramedic Practice.

Table 2: Employment status and preferences for paramedics and double registrants (n=65)[†].

	n (%)	Missing data
Current employment status		
Worked in last week	61 (93.9)	
Working more than one job	31 (47.7)	2
Usual number of hours worked per week, mean [SD]	36.2 (13.9)	2
Prefer to work more hours than current	28 (43.1)	6
Hours prefer to work if want more, mean [SD]	44 (9.7)	37
Where current job found, n=22:		
Internet or social media	5 (22.7)	-
Family, friends, or work networks	5 (22.7)	
Graduate program or internship	10 (45.5)	
Other	2(9.1)	

[†]Participants registered as nurses only are excluded from this analysis.

Table 3: Current discipline of practice and preferred location (n=54)[†]

		All included n(%)	Rural background n(%)
Currently practicing in health profession for which you most recently qualified	Yes	32 (59.3)	5 (35.7)
Currently working in your preferred geographic location[‡]	Yes	20[‡] (37.0)	3[‡] (21.4)

[†]Participants registered as nurses only are excluded from this analysis.

[‡]Unanswered for n=23