

## The threshold of rural placement frequency and duration: A repeated cross-sectional study examining rural career aspirations among student nurses

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### ARTICLE INFO

#### Keywords:

Students  
Learning  
Rural nursing  
Rural communities  
Social participation

### ABSTRACT

**Aim:** This study aimed to explore what changes rural placement had on the perceptions of nursing students and the impact of placement frequency and duration on student considerations for rural practice.

**Background:** A strong rural healthcare workforce is a global concern and has led countries to look for creative ways to address this challenge. One approach is to train more health professionals, however, nursing students who grew up or lived in metropolitan or urbanised areas are suggested to be less inclined to pursue a rural career. As such it is posited that recurrent exposure to rural settings may exert a positive impact on future intention for rural practice. However, there is a need to explore the specific thresholds related to both the frequency and duration of rural placement exposure, as well as the cumulative impact multiple rural placements may have on the intention to engage in rural practice.

**Design:** A repeated cross-sectional design.

**Methods:** All nursing students from an Australian regional university were invited to complete an online questionnaire between 2019 and 2023. Demographic and placement specific questions were included. A modified version of the Nursing Community Apgar tool also measured the importance of key variables in rural career decision-making. Data were analysed using independent sample t-tests and one-way ANOVAs. Significance was determined at two-tailed  $p \leq .05$ .

**Results:** Among the 835 respondents (response rate 15.4%), the average number and duration of rural placements was 2.45 placements and 3.01 weeks respectively. Rural placements did not have an impact on students who resided rurally or regionally. However, among metropolitan students who had experienced more than three rural placements, or more than sixteen cumulative weeks of placement, were significantly more likely to consider rural employment. Greater number of rural placements and longer cumulative duration had the greatest impact.

**Conclusion:** Issues related to the nursing rural workforce are dynamic and complex. Understanding the unique drivers that improve the rural experiences among students, particularly metropolitan students, can have an impact on decision-making to pursue employment in rural environments. Importantly, whilst professional and clinical motivation and experiences are influential factors, the socialisation, environment and community features are essential elements that influence students' decisions to pursue a career in rural practice. Undertaking a nuanced approach that facilitates rural practice understanding among students may help shape future employment decision-making.

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<https://doi.org/10.1016/j.nepr.2024.103989>

Received 19 January 2024; Received in revised form 20 April 2024; Accepted 28 April 2024

Available online 4 May 2024

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## 1. Introduction

Governments worldwide have prioritised addressing healthcare workforce shortages in rural and remote areas, resulting in increased rural and remote educational and training opportunities to attract more graduates (Humphreys et al., 2018; Strasser, 2016). The sustainability of a robust rural healthcare workforce is an ongoing challenge, prompting countries to seek innovative solutions to tackle this workforce shortfall (Cosgrave et al., 2019; Cosgrave et al., 2018; Longenecker and Schmitz, 2017). Efforts have yielded key insights and some success into recruiting and retaining health professionals in rural regions (Kumar and Clancy, 2020). However, there is a propensity for initiatives to focus on the medical profession. Specifically, there is an emphasis on increasing rural student enrolments, increasing rural accessibility of medical training, including rural medicine in the curricula, investing in rural training pathways, postgraduate training in rural environments and the less influential factor of financial incentives (Kumar and Clancy, 2020; McGrail et al., 2023a; Seal et al., 2022). International literature suggests the nursing profession has not been well valued and often policy is based on a misleading assumption that what works for the medical profession also applies to nurses, who are markedly a different profession (Drennan and Ross, 2019). Past policies have been incongruent with the scale of the nursing workforce and have had an impact on the capacity of the profession to influence national workforce policy, meaning action is slow and fewer tools are available to address workforce shortages (Drennan and Ross, 2019). These factors are compounded further through the complex mixture of contextual factors that are unique to rural areas, requiring a more nuanced understanding. As such, limited research has specifically focused on understanding the driving factors of seeking rural employment among nursing students and newly graduated nurses (Terry et al., 2021) and offers a useful focus for consideration.

While additional research is needed, evidence suggests the factors driving a health professional's long-term commitment to rurality include having a rural background, those who experience extended rural clinical placements and those considering rural employment after graduation (Lea et al., 2008; Playford et al., 2020; Smith et al., 2018; Sutton et al., 2016). Specifically, the Rural Nursing Workforce Hierarchy of Needs model has indicated what students consider important in undertaking rural employment after graduation. The model is made up of groups of factors that students consider to be important to undertake rural employment and encompass clinical, managerial, practical, fiscal, familial and geographical factors, each having different levels of importance placed on them (Fig. 1) (Terry et al., 2021).

As such, the Rural Nursing Workforce Hierarchy of Needs model

provides a clearer understanding of the most basic first order needs that need to be addressed before higher level needs are even considered among nursing students when contemplating rural employment. In this sense, for nursing students to consider a career in a rural health care setting, the clinical needs must be met before other higher-order factors are considered (Terry et al., 2021). Therefore, focusing on the geographical factors of rural practice would be fruitless among nursing students if the fundamental needs such as clinical, management or practical factors remain unsatisfied. Although all factors may be viewed simultaneously by a student, it is not until the lower level and first-order elements are met that other higher-level factors will be fully considered in the decision-making process (Terry et al., 2021).

In the context of the Rural Nursing Workforce Hierarchy of Needs model, students must have exposure to rural communities, lifestyle and clinical practice to better inform their decision-making. It has been suggested by, for example Russell et al. (2021), that one approach is to train more health professionals who are from rural and remote locations, so that they can return to those areas after graduating. This has shown some success (Russell et al., 2021), with others arguing that training in place is one possible solution but does not reduce the loss of rural students to the cities and larger regional centres, who may not return until years later (May et al., 2018; Sowl et al., 2022).

Among those nursing students who grew up or lived in metropolitan or urbanised areas, there is a reasonable assumption that they are less inclined to pursue a rural career (Terry et al., 2019). However, our current understanding suggests a potential relationship between an extended placement duration and exposure in rural areas exists that may lead to an elevated intention to engage in rural practice (Thomas et al., 2021). This notion posits that recurrent exposure to rural settings may exert a positive impact on key elements of the Rural Nursing Workforce Hierarchy of Needs and future intention for rural practice (Smith et al., 2018). This has been further demonstrated among the undergraduate and post-graduate medical workforce, where rural background, rural immersion and the length of time in rural areas have a positive impact on future rural practice (May et al., 2018; McGrail et al., 2023b; Seal et al., 2022; Thomas et al., 2021). Evidence also suggests that once a student graduates the window of opportunity to influence rural employment considerations diminishes (Campbell et al., 2021; Fatima et al., 2018). As such, the student phase of the nurse's professional journey represents a ripe time to stimulate their thinking about future employment, particularly practicing rurally. Therefore, the proposed association between the length of rural or remote placement experiences for nurses and their inclination to pursue rural employment warrants in-depth investigation. However, it must also be understood in the

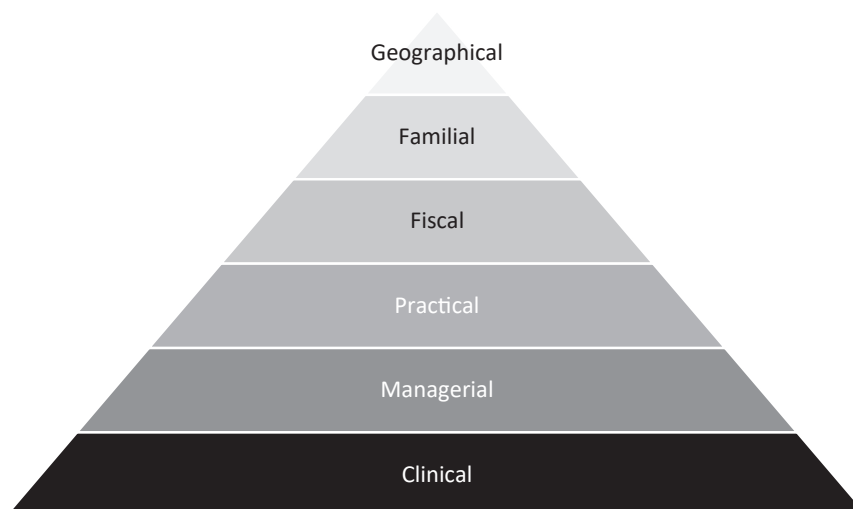


Fig. 1. The Rural Nursing Workforce Hierarchy of Needs model or hierarchy of workforce need.

context of limited resources, placement unavailability, along with monetary, social and time-related costs that constrain students to undertake rural and remote placement (Mortimer et al., 2019; Walsh et al., 2023).

The tenants of social identity theory as outlined by Ham (2023) and professional socialisation described by Dalton (2008) can also provide insight into the sociocultural factors that can underpin career choices. As such, professional socialisation is both an intended and unintended process of cultural and social reproduction where individuals learn and acquire roles, attitudes, norms, behaviours and values of a new group or profession, while social identity encompasses the complex interplay between social networks and cultures that provide newcomers to a rural community with the capacity to gain a sense of belonging which can have an impact on rural career aspirations (Dalton, 2008; Dinmohammadi et al., 2013; Ham, 2023). In addition, Cosgrave's (2020), whole-of-person retention improvement conceptual framework, where sense of place, place attachment and belonging-in-place can also inform a whole-of-community approach to improve rural health workforce recruitment and retention strategies (Gillespie et al., 2022).

Such insights underscore the importance that higher education providers must capitalise on exposing students to diverse rural experiences as part of their program of study (Smith et al., 2019; Walsh et al., 2023). However, there is a need to explore the specific thresholds related to both the frequency and duration of rural placement exposure, as well as the cumulative impact multiple rural placements have on the intention to engage in rural practice. Additional insights remain lacking regarding the key factors associated with the decision-making of taking up rural practice and how students are influenced by rural placement exposure, particularly among those with non-rural backgrounds (Smith et al., 2018).

The primary aim of this study was to explore what changes rural placement had on nursing student perceptions, principally the threshold of placement frequency and duration to improve or have an impact on a student's decision to consider rural practice. This was to be considered in the context of where students grew up and the geographical location they were currently living. The secondary aim was to explore on which individual or groups of factors associated with pursuing a rural nursing career placement frequency and duration had an impact on.

## 2. Methods

This study employed a repeated cross-sectional research design. The study was conducted at an Australian regional university over a five-year period and was couched in a broader longitudinal investigation examining student and early career nurse career trajectories (Pregaman et al., 2017).

### 2.1. Sample

Invitations were extended to all students enrolled in the three-year Bachelor of Nursing program at an Australian regional university between 2018 and 2023. Student participation was undertaken through an online survey administered through Qualtrics software (Qualtrics®, Version May 2021). This repeated cross-sectional approach enabled the entire student population to be invited annually, which meant that some students may have received multiple invitations over the five-year period as the study did not follow a consistent sample of students over time. Therefore, the repeated cross-sectional design and recruitment strategy resulted in a higher number of participation requests over the timeframe compared with the actual number of students in the degree program ( $n = 5422$ ) (Table 1). For the purposes of this study, only the most recent responses among second- and third-year students were included. To achieve this, we linked questionnaires from multiple years using participant birthdates and postcodes, ensuring the most recent responses were analysed while upholding participant confidentiality. As first year students had not undertaken placements at the time of the

**Table 1**

Total enrolments over three-year period.

Student enrolments	2019	2020	2021	2022	2023
2nd year enrolments	931	953	819	950	745
3rd year enrolments	501	416	683	571	448
Total enrolments (Actual)	1432	1369	1502	1521	1193

questionnaire administration, they were not included in the sample. To ensure our study had adequate statistical power to detect a 5% absolute difference within and between groups, we calculated that a sample size of  $n=363$  was necessary, with an alpha level of 0.05 and a margin of error of  $\pm 5\%$ .

### 2.2. Data collection

Data collection occurred during the mid-year study break (May–June) of each academic year between 2018 and 2023. Follow-up reminders were sent in weeks 1, 2 and 4 after the initial invitation.

### 2.3. Data collection tool

The survey included 23 demographic questions including gender, year of birth, past and current place of residence, current employment, possible future work locations, income and marital status. To categorise students according to their rural backgrounds, they were asked to specify whether they grew up in one of the following settings: Inner city Metropolitan, Outer suburb Metropolitan, large town or regional centre, small town, or on a property or farm. These responses were then coded according to the Modified Monash Model (MMM) geographical classifications (MM1 Metropolitan area, MM2 Regional and MM3–5 Rural) (Smith et al., 2018). In addition, students were asked questions associated with their 800 hours (20 weeks) of clinical placements which formed part of their nursing program, where individual placement days were 8-hour shifts and placements lasted between two and five weeks at a time. Key questions associated with clinical placement included the number of total placements, the number of rural placements and the length of total time they undertook each rural placement (Pregaman et al., 2017).

In addition, the survey also included a modified version of the Nursing Community Assessment Questionnaire (NCAQ), which was tailored to suit the Australian clinical context. The NCAQ contains 50 factors relevant to nurse recruitment and retention in rural areas and ascertains the advantages or challenges and the level of importance placed on working in rural areas for each individual factor. The 50 factors are classified into five groups, each containing ten questions that focus on geographic, economic and resource, management and decision-making, practice environment and scope of practice and community and practice support factors (Pregaman et al., 2014). Examples of factors include recreational opportunities, spousal satisfaction, housing affordability, hospital leadership, nurse empowerment, clinical variety and challenge, job satisfaction and sense of reciprocity between nurses and the community (Supplemental file 1). All which have the potential to provide insight into the importance of sociocultural factors that influence student decisions and career choices (Pregaman et al., 2014). The NCAQ has good reliability with a high Cronbach's alpha of .960, along with strong face and content validity (Pregaman et al., 2014; Pregaman et al., 2017). In the context of the study, students were asked to indicate the level of importance they ascribed to each of the 50 factors in the NCAQ using a four-point scale, ranging from "very important" to "very unimportant", which enables the level of importance placed on considering rural nursing practice to be measured (Terry et al., 2021).

### 2.4. Data analysis

Data were cleaned, verified and subsequently analysed using

Microsoft Excel (Version 16.0.1, Microsoft, Redmond, WA, USA) and Statistical Package for the Social Sciences (SPSS, Version 28.0.1, IBM, Armonk, NY, USA). Following the methodology outlined by [Prengaman et al. \(2014\)](#), quantitative values were assigned to the four-point scale based on students' perceived importance of each factor (very important = 4, important = 3, unimportant = 2, very unimportant = 1). Subsequently, these importance scores for each factor were averaged across all participants to calculate an overall mean score, which has been described in detail elsewhere ([Prengaman et al., 2017](#)). Specifically, higher mean scores are associated with a greater number of factors considered to be important when considering taking up rural employment. As such, a lower mean score indicates there are fewer factors, or barriers, that would inhibit considering rural employment. For example, a lower mean score associated with job satisfaction, patient safety, or demographic/patient mix, would indicate there were less of a concern for a student regarding these factors when considering rural employment. Data were analysed by conducting independent sample t-tests and one-way ANOVAs. Significances was determined at two-tailed  $p \leq .05$ .

### 2.5. Ethical considerations

Ethical approval for the study was procured from the [Blinded for review] Human Research Ethics Committee (Approval #blinded for review). All aspects of the research adhered to the ethical principles for medical research on human beings, as set out in the Declaration of Helsinki ([World Medical Association, 2013](#)). Each participant provided informed consent prior to commencing data collection.

### 3. Results

Among the  $n=835$  (response rate 15.4%) second- and third-year students who responded, almost two-thirds ( $n=539$ ) were aged between 20 and 39 years and just under a third ( $n=252$ ) grew up in metropolitan or urban centres. Just over one-fifth ( $n=193$ ) were living in a larger regional centre at the time of participation and more than a third ( $n=322$ ) of all participants were living in a rural setting. The average length of residence that students had lived in their current communities was 12.7 years (range 0.5–60 years) with no significant difference associated with length of residence between metropolitan, regional, or rural students. A third of participants ( $n=269$ ) saw themselves working in a metropolitan or urban area after graduating ([Table 2](#)). Further, the average number of rural placements per student was 2.45 and the average rural placement length was 3.01 weeks (120.4 hours) per placement, while 68% of all placements undertaken were considered by students as being 'rural'.

Where students were currently living had a significant relationship to where students saw themselves working after graduation ( $\chi = 106.512$ ,  $df = 8$ ,  $p = 0.001$ ,  $\phi = 0.398$ ). Specifically, the highest proportion of students living in metropolitan or urban areas (57.7%) indicated they wanted to work in these same areas. When examining the overall level of importance that second and third year students placed on considering rural employment, there was no significant difference between year levels,  $t(591) = 0.758$ ,  $p = 0.225$ . However, students who had indicated they wanted to work in rural settings had significantly lower importance scores (3.15) or less barriers compared with those who wanted to work in metropolitan or urbanised setting (3.47) after graduation,  $F(4, 540) = 34.605$ ,  $p = .001$ . Students with higher NCAQ scores demonstrate they were less likely, or it would be more difficult for them to consider taking up rural employment.

In addition, rural students had lower overall importance scores (3.35) or less barriers associated with taking up rural employment compared with metropolitan students (3.47),  $F(2, 532) = 4.705$ ,  $p = .009$ . Specifically, the factors that scored much lower among rural students compared with metropolitan students included geographic factors  $F(2, 536) = 7.962$ ,  $p = .001$ , economic factors  $F(2, 536) = 4.503$ , .011 and management factors  $F(2, 536) = 3.694$ ,  $p = .026$ . These

**Table 2**  
Participant demographics.

Demographic information	Frequency	Percentage (%)
Gender (n=835)	719	86.1
– Female	46	5.5
– Male	2	0.2
– Other	68	8.1
– Missing		
Age (years) (n=835)	43	5.1
– Under 20	323	38.7
– 20–29 years	216	25.9
– 30–39 years	161	19.3
– 40–49 years	60	7.2
– Over 50 years	32	3.8
– Missing		
Where student grew up (n=835)	252	30.2
– Metropolitan area (MM1)	146	17.5
– Regional area (MM 2)	322	38.6
– Rural (MM3–5)	115	13.8
– Missing		
Where student lives now (n=835)	279	33.4
– Metropolitan area (MM1)	193	23.1
– Regional area (MM 2)	271	32.5
– Rural (MM3–5)	92	11
– Missing		
Number of rural placements (n=589)	85	14.4
– No rural placements	185	31.4
– 1 rural placement	144	24.4
– 2 rural placements	57	9.7
– 3 rural placements	118	20.0
– More than 3 rural placements		
Number of weeks on rural placement (n=589)	236	40.0
– 1–5 weeks	136	23.1
– 6–10 weeks	67	11.3
– 11–15 weeks	39	6.7
– 16 or more	111	18.9
– Missing		
I see myself working in (n=835)	269	32.2
– A metropolitan or urban setting	299	35.8
– A rural/regional setting	34	4.1
– A remote setting	125	15.0
– I do not know	23	2.8
– Overseas	85	10.2
– Missing		

lower scores among rural students demonstrating their decision-making regarding taking up rural employment is less likely to be challenging compared with metropolitan students.

Further examination regarding the number of rural placements and the length of time students had undertaken rural placement were explored to ascertain what impact these had on the level of importance students placed on key factors associated with taking up rural employment. The number of placements were shown to have an impact, where student importance scores were lower among those who had undertaken three or more rural placements. Thus, there were fewer factors, or barriers, inhibiting students considering rural employment. Of note, the greater the number of placements the lower the importance or the fewer factors inhibiting taking up rural placement.

These findings were mirrored when examining the number of placement weeks that were undertaken in rural practice, suggesting that the greater the number of weeks in rural placement, the need to address key elements associated with taking up rural employment are lowered ([Table 3](#)). Therefore, as the proportion of rural compared with metropolitan placements undertaken increased, the likelihood that factors or barriers important to consider rural employment decreased and rural employment decision-making was made much easier,  $r(400) = -.120$ ,  $p = 0.017$ .

In addition to the number of placements that students undertook in rural areas, it was vital to examine rural placements in relation to where they grew up and where they were living at the time of the survey. This was to ascertain if geographical background and experience had an impact on importance levels in undertaking rural employment after

**Table 3**  
Overall NCAQ scores according to amount of rural placements and number of weeks.

Number of placements	0	1	2	3	>3	Test (df) Statistic	p
	3.45	3.54†	3.44	3.43	3.20†	F(4, 191) = 2.420	.050*
Number of placement weeks	1–5	6–10	11–15	>16			
	3.46†	3.40	3.38	3.25†		F(3, 334) = 2.718	.045*

\*  $p \leq 0.05$ ; †Scores significantly different

graduating. Overall, the analysis highlighted that growing up in or currently living in a rural or regional area had no impact on the level of importance placed on key factors in undertaking rural employment regardless of the number,  $F(4, 138) = .613$ ,  $p = .654$ , or duration of placement weeks,  $F(3, 181) = 2.418$ ,  $p = .069$ . Thus, when students with a rural background or rural residence undertook rural placements no changes in NCAQ scores were observed.

However, students who had grown up or were currently living in a metropolitan or urbanised area and who undertook rural placements had demonstrated the level of importance placed on taking up rural practice had decreased relative to the number of placements undertaken. Specifically, among this cohort, those who had undertaken three or more rural placements had lower mean NCAQ scores compared with those who undertook less than three rural placements  $F(4, 242) = 2.991$ ,  $p = .020$ . This suggests the need to address key elements associated with taking up rural employment are lower when undertaking three or more rural placements. Similarly, those who undertook more than 16 weeks of rural placement had lower mean NCAQ scores  $F(3, 181) = 3.257$ ,  $p = .023$ .

When specifically examining groups of key factors among those growing up in metropolitan or urban areas, it was demonstrated that three or more placements lowered importance scores associated with geographic, managerial and community factors. The only groups of factors that remained relatively similar regardless of the number of rural placements were associated with practice and economic factors. However, when examining students currently living in metropolitan or urbanised areas, similar findings were noted, however, were specifically related to managerial and community factors (Table 4).

When examining each of the 50 individual factors, it was noted the greater the placement number experienced by those who grew up in metropolitan or urbanised settings, individual key factors became less important in the decision making regarding taking up rural practice. These factors included access to larger communities, the weather, nurses' ability to participate in decision-making, acknowledgement of nurses' accomplishments, autonomy and respect, the perception of quality of care in the rural community, perception of rural health care and access to distance education.

The number of placement weeks that students undertook in rural areas was also examined in relation to where they grew up and where they were living at the time of the survey. Much like the initial examination, this was to ascertain if geographical background and experience

had an impact on importance levels of undertaking rural employment after graduating. In this case only growing up or currently living in a metropolitan or urbanised area and the number of rural placement weeks had an impact on the level of importance placed on taking up rural practice.

Specifically, students who grew up in metropolitan or urban areas and experienced 11 or more cumulative weeks of rural placement overall had lower overall NCAQ scores than those who had fewer weeks on rural placement. Suggesting measures of importance regarding taking up rural employment is significantly lower and therefore decision-making regarding taking up rural employment is more likely to be challenging when a lower number of cumulative weeks of placement have occurred.

When examining each group of key factors, growing up in metropolitan or urban areas also demonstrated that more than 16 cumulative weeks of placement lowered importance scores associated with geographic, managerial and community factors. As previously noted, the factors that remained relatively similar regardless of number of placement weeks experienced were associated with practice and economic factors. However, when examining students currently living in metropolitan or urban areas, only geographic and community factors demonstrated significantly lower levels of importance as the number of cumulative weeks of rural placement reached between 11 and 15 weeks (Table 5). It must be noted those students who experienced 16 or more cumulative weeks of rural placement showed little or no change, however, given this cohort were relatively few, this may provide insight into the score variation.

Lastly, when examining each individual factor, it was noted the greater the number of placement weeks experienced, the following factors became less important in the decision making regarding taking up rural practice. These factors included the weather, the lifestyle of the rural town, the size of the community, acknowledgement of nurses' accomplishments, the sense of reciprocity between nurses and community and access to distance education.

#### 4. Discussion

Overall, the modified NCAQ examined the importance placed by nursing students on 50 key factors associated with considering rural employment, where lower scores demonstrate lower levels of importance and fewer factors or barriers being placed on the critical decision

**Table 4**  
Importance scores relative to background, current residence and number of rural placements.

Number of placements		0	1	2	3	>3	Test (df) Statistic	p
Grew up in metropolitan or urban	Geographic	3.21†	3.05	3.19†	3.20†	2.70†	F(4, 158) = 4.294	.003*
	Economic	3.45	3.46	3.57	3.48	3.26	F(4, 158) = 1.288	.277
	Management	3.65†	3.58†	3.70†	3.60	3.19†	F(4, 158) = 4.699	.001**
	Practice	3.60	3.60	3.67	3.61	3.34	F(4, 157) = 2.129	.080
	Community	3.59†	3.54	3.63	3.52	3.20†	F(4, 158) = 3.281	.013*
	NCAQ	3.50†	3.44†	3.55†	3.48†	3.14†	F(4, 157) = 3.819	.005*
Living now in metropolitan or urban	Geographic	3.15	3.20	3.16	3.00	2.94	F(4, 193) = 1.295	.274
	Economic	3.43	3.52	3.44	3.44	3.30	F(4, 193) = 0.828	.509
	Management	3.59†	3.62†	3.50	3.63†	3.21†	F(4, 193) = 3.060	.018*
	Practice	3.58	3.66	3.55	3.62	3.36	F(4, 191) = 1.648	.164
	Community	3.52	3.65†	3.50	3.54	3.20†	F(4, 191) = 3.178	.015*
	NCAQ	3.45	3.54†	3.43	3.44	3.20†	F(4, 193) = 2.420	.050*

\*  $p \leq 0.05$ , \*\* $p \leq 0.001$ ; †Scores significantly different

**Table 5**  
Importance scores relative to background, residence, and number of rural placement weeks.

Number of weeks		1–5	6–10	11–15	>16	Test (df) Statistic	p
Grew up in metropolitan or urban	Geographic	3.12†	3.14†	2.82	2.70†	F(3, 102) = 2.990	.034*
	Economic	3.51	3.57	3.28	3.20	F(3, 102) = 2.552	.060
	Management	3.62†	3.61	3.42	3.23†	F(3, 102) = 3.050	.032*
	Practice	3.63	3.63	3.40	3.35	F(3, 102) = 2.394	.073
	Community	3.55†	3.63	3.12†	3.32	F(3, 102) = 4.835	.003*
	NCAQ	3.49†	3.52†	3.14†	3.22	F(3, 102) = 4.013	.010*
Living now in metropolitan or urban	Geographic	3.21†	3.11	2.83†	3.40†	F(3, 124) = 2.721	.047*
	Economic	3.52	3.43	3.37	3.34	F(3, 124) = 6.56	.581
	Management	3.63	3.46	3.27	3.46	F(3, 124) = 2.628	.053
	Practice	3.67	3.52	3.41	3.40	F(3, 124) = 2.117	.102
	Community	3.64†	3.44	3.20†	3.38	F(3, 124) = 4.326	.006*
	NCAQ	3.54†	3.39	3.21†	3.39	F(3, 124) = 3.028	.032*

$p \leq 0.05$ ; †Scores significantly different

of taking up rural practice. For example, among students with a background of or who were currently living in rural or regional centres, there was little to no difference in NCAQ scores regardless of how many placements or number of weeks of placement experienced. This suggests rural placement experiences among rural and regional students had little to no bearing or impact on decision-making. McGrail et al. (2023b) and Yates et al. (2023), have highlighted students from rural backgrounds are aware of, have experience with and understand what it means to live rurally, which may be why no change in NCAQ scores were observed among this cohort of students.

As such, rural placements remain beneficial for rural and regional students to consolidate practice, to further develop skills and prepare for professional practice rather than to provide rural socialisation opportunities that have an impact on rural employment decision-making (Cosgrave et al., 2018). In this case, the socialisation aspects of placement that occurs outside of placement hours for students with rural backgrounds, in terms of familiarisation with and the benefits of rural practice employment and lifestyle, may be inconsequential (Dalton, 2008; Fowler et al., 2018; Viljoen, 2021).

However, this was not the case with students from metropolitan or urban centres, where undertaking more than three rural placements had the greatest impact. In this sense, the greater frequency with which students undertook placements in rural contexts, the more likely they would consider if rural practice was a viable career option. Cosgrave et al. (2018) have suggested that employment decisions and where employment occurs, particularly among health professionals, is associated with the strong social bonds, familiarity with the physical environment and sense of enjoyment that may be provided through a rural lifestyle. Specifically, among these students, more than three placements represented a threshold frequency needed to have any tangible impact on overall level of importance placed on taking up rural employment. This finding is analogous with other research that examined the impact of rural placement on rural practice decision-making among multidisciplinary health care students, where clinical placement in rural areas had a positive impact on students who were undecided regarding their interest in rural employment post-graduation (Johnson et al., 2019; Seaman et al., 2022).

Notably, students from metropolitan or urbanised areas are motivated to choose rural practice after undergoing rural placements where they experience community recognition and a sense of belonging, both professionally and socially (Mandal and Phillips, 2022; Ray et al., 2018). The Rural Nursing Workforce Hierarchy of Needs model, which focuses on other variables, suggested that clinical, managerial and practical elements continue to be crucial elements of the decision-making process on which the number of rural placements had an impact. Despite the heterogeneous situations where students undertook rural placements, the model may potentially complement another layer of perception surrounding decision-making (Terry et al., 2021). Regardless, the importance of comprehending which key factors that have an impact on student decision-making and the order where students rank or prioritise

these elements remain critical for rural healthcare. By discerning these shifts in importance, health care services may more broadly gain insights to inform future nursing recruitment and retention efforts, to enhance workforce planning and contribute to the broader healthcare landscape (Terry et al., 2024).

Further, results in this study found that, having more than 16 cumulative placement weeks in rural areas was the threshold length of time required to have any significant impact on overall level of importance placed on taking up rural employment. It was highlighted, however, that as NCAQ scores decreased, the greater the number of rural placement weeks were experienced. In line with the whole-of-person retention improvement conceptual framework, as metropolitan students spend increased time on rural placements, there is the capacity to developing a sense of place which enables key value to be associated with location (Cosgrave, 2020; Cosgrave et al., 2019). In addition, students may experience place attachment where bonds and identity are developed, along with belonging-in-place where the establishment of social connections occur (Gillespie et al., 2022). This would suggest that any rural exposure through placement for more than four weeks will have a positive impact on student's rural career decision-making, highlighting the important role rural placement experiences have in improving rural workforce outcomes (Seaman et al., 2022; Skinner et al., 2022).

Despite the finding that four or more weeks of placement will have a positive impact, Playford et al. (2006) found, after controlling for rural background, that multidisciplinary health care student placements of less than four weeks were more positively associated with rural practice outcome. However, it must be noted, placements among nursing students in the cohort were not positively associated with rural practice outcomes. Regardless, it remains unclear if placement duration of more than four weeks was one placement or several placements leading to a cumulative duration of more than four weeks. It was indicated that longer rural placements were associated with greater social separation from family and friends, challenges associated with transport and a loss of income for those who were working (Playford et al., 2006). Despite longer placement having been considered more likely to have a detrimental impact, more recent insights suggest shorter placements do not provide sufficient time for students to comprehend the implications of rural employment, nor do they enable adequate socialisation in rural communities (Cosgrave et al., 2018; Dinmohammadi et al., 2013; Dwyer, 2022).

However, the study conducted by Thomas et al. (2021) noted two or more placements and more than six weeks led to multidisciplinary health care students having a three- to six-fold increased likelihood of undertaking rural employment. In addition, other studies found that the greater time spent on rural placement was positively associated with working in rural practice (Seaman et al., 2022; Skinner et al., 2022; Sutton et al., 2021). Specifically, less than four weeks rural placement had no impact, whereas four to eight weeks and more than 10 weeks had two- to more than a four-fold increase likelihood of students to practice

rurally (Sutton et al., 2021). This further suggests an increased number of shorter rural placements leading to a greater number of cumulative placements weeks may therefore have greater benefit among students, as demonstrated in the context of this study. This finding may also address social dislocation and financial burden issues among students undertaking much longer placement (Seaman et al., 2022).

Beyond the number of placements and the placement week threshold that was shown to influence overall decision-making or levels of importance placed on considering rural practice, other key elements of decision-making were shown to centre on certain aspects of a rural community and the workplace (Terry et al., 2021). This plays a vital role in understanding what are the key factors or elements on which rural placements have an impact and where education providers and rural health services need to focus their energies to improve future student decision-making when contemplating rural practice. It is recognised that rural placement experiences contribute to rural practice decision-making, however, other key influential factors also contribute to any decision-making processes. These include family, social and cultural elements which are in line with sense of place, place attachment and belonging-in-place as informed by a whole-of-community framework to improve rural health workforce recruitment and retention (Cosgrave et al., 2019; Cosgrave et al., 2018; Gillespie et al., 2022; Seaman et al., 2022; Terry et al., 2021).

Specifically, in this study the more nuanced insights were provided where greater number of placements had a tangible impact on geographic, management and community factors. Geographical elements were centred on being able to access shopping, dining, entertainment and religious or cultural events that are often easily accessed in metropolitan areas, in addition to proximity to family support, spousal employment and quality education. Management factors focused on having trust and confidence in an effective executive and nurse managers along with the capacity to be involved and empowered to participate in the decision-making and development of the workplace and career development opportunities. Lastly, community factors are associated with the perceived quality of the health facility and other health services, along with the perception of the community itself and whether it is the right fit for the family (Pregaman et al., 2014; Pregaman et al., 2017). In the context of the whole-of-person framework, Cosgrave (2020) has further argued that life stage, family fit and sense of belonging, rather than rural origin, remains a major determinant of employment decision-making, particularly in rural contexts.

Beyond the collective group of factors, several individual factors became less important or barriers in taking up rural practice as the number of rural placements occurred among those who grew up in metropolitan or urbanised areas. These key factors were access to larger communities, the weather, nurses' ability to participate in decision-making, acknowledgement of nurses' accomplishments, autonomy and respect, the perception of quality of care in the rural community, perception of rural health care and access to distance education (Pregaman et al., 2017). Again, these have been highlighted elsewhere as key concerns amongst nurses and other health professionals considering rural practice (Cosgrave, 2020; Pregaman et al., 2014). With this nuanced understanding, supportive education providers and health services can assist student socialisation while developing rural understanding and social identity among students (Dinmohammadi et al., 2013; Ham, 2023; Pregaman et al., 2014; Seaman et al., 2022; Smith et al., 2018). For example, students undertaking rural placement may be see there is limited access to larger communities which is not a factor that can be modified. However, in these situations, health services may create positive social experiences to reorient student perspective regarding the rural community. Although the small community cannot be moved closer to larger centres, improved social connection and identity may influence students towards greater membership and less marginalisation in the rural community where they are placed (Ham, 2023; Pregaman et al., 2014; Pregaman et al., 2017; Smith et al., 2018; Walsh et al., 2023).

Overall, the identification of individual driving factors may aide key stakeholders, such as health services and education providers, to support students. Specifically, they may enable metropolitan students to see beyond what rural communities are perceived to lack and to observe what they have on offer as a way to developing a sense of place, place attachment and belonging-in-place that informs rural practice decision-making (Cosgrave, 2020; Gillespie et al., 2022; Ham, 2023; Skinner et al., 2022; Sutton et al., 2021; Terry et al., 2021).

#### 4.1. Limitations

Given the participating university has campuses in rural, regional and peri-urban locations with a large student cohort from rural and regional settings, this may limit the ability to generalise the findings. In addition, student respondents of the survey may not be representative of the whole student cohort given the low response rate, with only 15.4% of students participating in the survey in full, therefore the findings presented here need to be considered cautiously. The low response rate may be due to the survey being administered in the mid-semester break. To increase response rate without increasing coercion, the survey may be more suited to be administered at the end of the year. This study and future studies may be enhanced through opportunities for qualitative understandings of the meaning and experiences of the students themselves regarding the threshold of rural placement frequency and duration. In addition, the influence of clinical placements in the same facility, community, or geographic area, must be considered to understand if the 'dose effect' is greatly enhanced by the duration or recurrent placements occur at a single site rather than multiple rural sites. Understanding what experiences both in the clinical environment and outside the clinical environment that had an impact on student views of rural practice would be vital. This work is currently being undertaken by the research team.

#### 5. Conclusion

Issues relating to the nursing rural workforce are dynamic and complex. By understanding the unique and nuanced drivers that improve the rural experiences among students, particularly those from metropolitan or more urbanised areas, limited time and resources may be used to improve decision-making regarding rural practice. Further, utilizing a more focussed approach that relies on clear evidence regarding how best to improve socialisation, social identity and support clearer decision-making among students regarding rural practice may have greater impact. Additionally, a more clearly defined approach may also enable students to achieve similar decision-making outcomes in a fewer number of rural placements or fewer placement weeks, thus enabling more students to experience rural placements. Such nuanced processes could facilitate students 'arriving' more efficiently to a clearer understanding of rural practice and lead to greater consideration of the opportunities into the future.

However, by simply providing exposure to rural placement opportunities for students of nursing alone, will not increase the uptake in these areas. Instead, we have found that a targeted program of exposure that consists of three or more rural placements with 16 cumulative weeks in duration which is made up of any number of experiences in rural communities. This enables student socialisation and allow them to see how their hierarchy of needs can be met to facilitate a greater desire to work rurally. Importantly, whilst professional and clinical motivation and experiences are influential factors, the social fabric, environmental elements and community features are essential elements that influence students' decisions to pursue a career in rural practice, particularly among students from metropolitan areas. It is recommended that recruitment campaigns consider holistic approaches and strategies to enhance the appeal that rural practice and communities when providing employment opportunities.

## Funding sources

No external funding

## CRedit authorship contribution statement

**Blake Peck:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Daniel Terry:** Writing – review & editing, Writing – original draft, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Leah East:** Writing – review & editing, Writing – original draft. **Jessica Elliott:** Writing – review & editing, Writing – original draft. **Ed Baker:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization. **Liz Ryan:** Writing – review & editing, Writing – original draft. **David Schmitz:** Writing – review & editing, Writing – original draft, Methodology, Formal analysis, Conceptualization.

## 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.

## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.nepr.2024.103989](https://doi.org/10.1016/j.nepr.2024.103989).

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