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## ORIGINAL ARTICLE

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### A mixed-method study of chiropractic student clinical immersion placements in nonmetropolitan Western Australia: *Influence on student experience, professional attributes, and practice destination*

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**Objective:** To explore the influence of nonmetropolitan clinical immersion placements (CIPs) on undergraduate chiropractic student experience, professional attributes, and practice destination.

**Methods:** Students enrolled in an Australian undergraduate chiropractic program were invited to complete a service experience questionnaire and an open-ended reflective feedback form following a nonmetropolitan CIP (Part A). Online searches were performed to gather data on graduate practice location (Part B).

**Results:** Sixty-four students participated in Part A. All agreed that the placement was educational and should be retained in the program. Students agreed that the placement enhanced respect for individuals and awareness of others in need, highlighted the importance of respect for all people, improved empathy for the disadvantaged, and provided an opportunity to improve communication skills. Most indicated that they were more likely to practice in a country setting as a result of their placement, with those participating in a country placement more likely to practice in nonmetropolitan regions after graduation.

**Conclusion:** Many chiropractic programs around the world are adopting CIPs. This study is the 1st to investigate the possible influence of nonmetropolitan CIPs on the development of desirable attributes in Australian chiropractic students. It also discusses the potential influence of nonmetropolitan CIPs on future practice location decisions. These results support the utility of CIPs to help meet the educational objectives of chiropractic programs and possibly address the maldistribution of the chiropractic workforce in Australia.

**Key Indexing Terms:** Chiropractic; Clinical Clerkship; Curriculum; Educational Models; Rural Health Services; Students

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### INTRODUCTION

Timely and appropriate access to health care is an issue of ongoing concern for people living in nonmetropolitan Australia. Despite the high level of health care need in this widely dispersed population, with higher morbidity and mortality rates reported in regional areas than in the city,<sup>1</sup> health service provision in these regions is far from adequate due in part to ongoing workforce supply problems, geographical isolation, and resource scarcity. These challenges to health care provision are particularly evident in Indigenous and remote communities.<sup>2,3</sup> One approach to addressing this health workforce maldistribution has been to focus on the undergraduate clinical experience, with previous studies highlighting the positive

influence of nonmetropolitan undergraduate clinical training on promoting regional career intentions.<sup>4,5</sup>

Addressing the health care needs of people living in nonmetropolitan parts of Australia requires both innovation and the rethinking of existing approaches. There is increasing recognition of the importance of adopting a comprehensive primary health care model comprising multidisciplinary teams with a demonstrably positive influence on health outcomes, particularly in areas where resources are limited.<sup>6</sup> Over a decade ago, the Australian Productivity Commission discussed the challenges of meeting the demands of Australia's health system and canvassed the concept of task substitution across health care professions.<sup>7</sup> Chiropractors, by virtue of their primary contact training, may be able to assist in addressing the chronic shortage of health practitioners outside metropol-

itan areas,<sup>8,9</sup> particularly for the management of spinal pain.<sup>10,11</sup>

In common with other professions, a growing number of chiropractic programs are adopting clinical immersion placements (CIPs).<sup>12–21</sup> CIPs are a form of experiential clerkship characterized by “hands-on” community service involvement, which is integrated with the curriculum and designed to encourage social responsibility and active community participation.<sup>22,23</sup> Interest in this educational alternative has arisen from a perceived utility of this approach in fostering communication and interpersonal skills and a philosophy of caring.<sup>24</sup> These types of placements in other professions are also known to provide a variety of social and educational benefits, including enhanced moral development, social responsibility, and diminished racist attitudes.<sup>24,25</sup> While the Council on Chiropractic Education Australasia requires the use of educational strategies that provide community service experience and a diverse case mix in undergraduate chiropractic curricula, little is known about the utility of nonmetropolitan chiropractic CIPs in addressing this aspect of the Australian student experience or on graduate destinations.<sup>26</sup> If nonmetropolitan chiropractic CIPs are to continue to be incorporated into the undergraduate chiropractic clinical curriculum, a better understanding of their influence is required.

The aim of this study was to explore the influence of CIPs in nonmetropolitan Western Australia on Murdoch University (MU) undergraduate chiropractic student experience, professional attributes, and practice destination. The specific objectives of the study were to:

- Describe undergraduate chiropractic student perceptions of the utility of nonmetropolitan clinical immersion placements (Part A).
- Describe the potential influence of nonmetropolitan clinical immersion placements on the professional attributes of undergraduate chiropractic students (Part A).
- Ascertain whether participation in a nonmetropolitan clinical immersion placement influences undergraduate chiropractic student intention to practice in a nonmetropolitan setting (Part A).
- Determine the practice locations of all MU graduates between 2006 and 2014 (Part B).
- Measure the proportion of undergraduate chiropractic students who having completed a nonmetropolitan clinical immersion placement subsequently practice in a nonmetropolitan setting (Part B).

## METHODS

### Design

The study used a multimethod design,<sup>27</sup> utilizing survey (Part A) and publicly available national chiropractic registration data (Part B). Ethics approval was granted by the MU human research ethics committee (#2011/241) prior to data collection.

### Setting

The chiropractic program delivered through MU has conducted ongoing annual CIPs in the Kimberley, Pilbara, Gascoyne, and Mid-West regions in Western Australia since 2006. During the period we studied, around 150 students had provided an estimated 10,000 treatment visits to residents of remote townships and Indigenous communities. In collaboration with the Western Australian Centre for Rural Health<sup>28</sup> via the auspices of the University of Western Australia, the placements have been variously situated in Aboriginal medical services, hospitals, nursing posts, and community open spaces. Participation in these placements was voluntary and, in many cases, fully or partially self-funded by the student. Student selection into the placement program was made on application, being mindful of the cultural gender dynamics of Indigenous communities (i.e., Australian Indigenous people often have cultural preference for treatment by a person of the same gender<sup>29</sup>). In addition, those students who had not previously participated in a separate annual (international) placement were given some priority.

Prior to participation, all students and supervisors were required to complete contextual Indigenous cultural awareness training. In some cases, assistance was provided by industry and local government (shire councils), either “in kind” or financially. Management of patients presenting for care adhered to evidence-based guidelines, including active and passive components, advice and appropriate referral.<sup>30</sup> Where possible and as appropriate, liaisons were established to ensure that people who sought care from a chiropractic student and required ongoing care (after the placement) or consultation with another health care provider were referred to the nearest appropriate practitioner (e.g., chiropractor, physiotherapist, occupational therapist, nurse, or medical practitioner).

### Participants

Survey participants (Part A) were recruited from 5 consecutive cohorts of final-year (5th-year) undergraduate chiropractic students enrolled at MU. The inclusion criterion (for Part A) was completion of a CIP in nonmetropolitan (regional, rural, or remote) Western Australia between 2011 and 2015 ( $n = 64$ ). Participants included in the analysis of national chiropractic registration data (Part B) were previous chiropractic students enrolled at MU who completed their degree between 2006 and 2014. Of note, graduates from 2015 were not included in Part B as they had just completed their degree and were just entering the professional workforce during data collection.

### Data Collection

All students eligible to participate in Part A received an e-mail invitation to their student e-mail account (which contained a link to the online survey<sup>31</sup>) immediately following completion of their clinical placement with a reminder sent 2 weeks after the initial e-mail. Completion of the survey was voluntary and informed consent obtained. Participants were informed that the deidentified results may be published.

**Table 1 - Undergraduate Chiropractic Student Participation in a Clinical Immersion Placement by Sex and Location<sup>a</sup>**

Placement	Male	Female	% Female	Total
No (RA1)	150	161	51.7	311
Tom Price (RA5)	30	23	43.4	53
Kununurra (RA4)	11	22	66.7	33
Geraldton (RA3)	13	12	48.0	25
Mount Magnet/Meekatharra (RA5)	9	7	43.7	16
Carnarvon (RA4)	13	8	38.1	21
Total	226	233	50.8	459

<sup>a</sup> RA = remoteness area.

The online survey comprised 4 sections: (1) 13 items from the Service-Experience Questionnaire (SEQ); (2) 2 items on placement experience, including an overall rating of the CIP (i.e., strongly negative, negative, positive, strongly positive, unable to judge) and a comments box to explain the assigned rating; (3) 1 item on practice location intention (i.e., “Would you be more or less likely to consider practicing in a rural or remote setting as a result of the placement?” [less likely, no change, or more likely]); and (4) 1 reflective open-ended question (“Please provide a reflective paragraph on the placement. Feel free especially to comment on ways you feel the placement could be improved in the future”).

The SEQ (i.e., section 1 of the survey) assessed the influence of service learning on 5 specific competencies: caring attitudes, social responsibility, teamwork, confidence, and communication abilities.<sup>24</sup> Responses to each item in the SEQ were reported on a 4-point Likert scale (i.e., strongly disagree [1], disagree [2], agree [3], and strongly agree [4]), and an “unable to judge” option. Agreement with a statement was defined as having a score equal to or greater than 3 on the scale.

To address the objectives of Part B of the study, an online search was undertaken in January–February 2016 to determine the practice location of MU chiropractic students who graduated between 2006 and 2014. The online search results were cross-checked against Australian Health Practitioners Regulation Agency/Chiropractic Board of Australia public listings to confirm the practice location(s) for each graduate. Practice location was subsequently categorized into 1 of 8 groups: remoteness area (RA) 1–RA5 (according to the Australian Statistical Geography Standard),<sup>32</sup> international status, nonpracticing, and unknown. Where practitioners listed multiple locations, each location was checked against the Australian Statistical Geography Standard. If practice locations were identified across multiple RA categories, a match was recorded only once per practitioner if outside a metropolitan area.

### Data Analysis

Quantitative data were downloaded from the online portal<sup>31</sup> and analyzed using IBM SPSS Statistics version 22 (IBM Corporation, Armonk, NY) and GraphPad Prism (GraphPad Software, Inc, La Jolla, CA).<sup>33</sup> SEQ scores were expressed as simple proportions, mode, median, mean, and standard deviation, with higher scores representing stronger agreement. Graduate practice loca-

tions were reported as simple proportions and as odds ratios using chi-square tests.

Conventional and summative content analyses of the optional qualitative data were undertaken by 2 researchers, independently, using the methods described by Hsieh and Shannon.<sup>34</sup> For the conventional content analysis, all comments were initially read and thematically coded. After all comments were thematically coded, they were then reread and coded as being a positive or a negative statement relating to a particular theme. The qualitative responses were then quantified through a summative content analysis process whereby responses in each of the categories developed for the conventional content analysis were counted and then expressed as a proportion within each category.

## RESULTS

### Part A Sample

There were 64 MU students who participated in placements over the 5-year period, 2011–2015 (Part A). All 64 invited students provided usable data for the SEQ (<1% missing data). Most students ( $n = 52$ ) completed the survey immediately after their clinical experience, and there was a single follow-up e-mail after 2 weeks. In total, 86% of respondents provided qualitative feedback (i.e., had responded to the optional item in section 4 of the survey). In relation to the overall satisfaction and rating of the placements, the SEQ rating was 98% positive, and 87% of qualitative responses (within the category) were positive. A total of 148 final-year students from MU participated in a clinical immersion placement between 2006 and 2015 (Table 1) and thus were included for analysis in Part B.

### Utility of Clinical Immersion Placements

Student responses to the SEQ are summarized in Table 2. Due to the overall similarity in evaluations, the data for the 5 cohorts were combined for description. All students surveyed agreed that the experience was educational and that the placement should be retained in the curriculum. All responses received to the open-ended questions regarding placement duration and frequency expressed a desire for the placements to be more frequent. Those students who participated in the 2-week placements (at Tom Price) felt it was long enough; conversely, those who

**Table 2 - Student Evaluations Questionnaire Descriptive Statistics<sup>a</sup>**

	Agree (% Rounded)	Median	Mode	Mean
Part 1: Placement assessment				
Your feelings about the placement as a whole				
1. It was educational	100	4	4	3.78
2. I learned a lot from the placement	100	4	4	3.7
3. It should be longer	16	2	2	2.18
4. It should not be eliminated from the program	100	4	4	3.96
5. It made me feel like I made a difference	98	4	4	3.61
Part 2: Specific competencies				
Specific perceptions about competencies				
1. The placement highlighted the importance of respect for all people	94	4	4	3.47
2. The placement enhanced my awareness of other individuals in need	94	3.5	4	3.42
3. The placement enhanced my confidence in interacting with other health professionals	79	3	3	3
4. The placement provided the opportunity to enhance my communication skills	98	4	4	3.73
5. The placement made me realize how much I have to offer those in need	94	4	4	3.56
6. The placement gave me the opportunity to learn firsthand about empathy for the disadvantaged	88	3	3	3.24
7. The placement makes me want to do community service work in the future	85	3	3	3.14
8. I learned about the importance of teamwork	92	3	3	3.32
9. The placement impressed upon me the many opportunities for chiropractors to serve the community	94	4	4	3.53
10. I am more aware of the needs of the community as a result of the placement	88	3	3	3.3
11. Community service is a part of the chiropractor's contribution as a health professional	91	3	4	3.39
12. The placement did a lot to change prior perceptions I had about the community I served	65	3	3	2.89
13. Community service is effective in enhancing the perception of personal awareness	97	3	3	3.44
Composite values from Q1.1–Q2.13	88	4	3.5	3.37
Overall rating of the placement	98	4	4	3.83
Affected intention to practice in a nonmetropolitan setting	57			

<sup>a</sup> Agree = score equal to or greater than 3 on a 4-point Likert scale: 1 = strongly disagree; 2 = disagree; 3 = agree; 4 = strongly agree (missing data, 1.1%).

went to other locations for 1 week thought the placements should be longer. All qualitative responses regarding change in attitude toward rural health care and the role of the chiropractic profession in rural communities were positive regardless of placement location or duration.

### Professional Attributes

Data from the SEQ revealed that students generally agreed that their placement had enhanced respect for the individual and awareness of others in need (94%), highlighted the importance of respect for all people (94%), improved empathy for the disadvantaged (88%), and provided them with an opportunity to improve their communication skills (98%). Students also commented positively in the optional open-ended questions regarding skills learned and experience gained during the placement, with reported improvements in communication (39% within the category), time management (30% within the category), and diagnostic and therapeutic skills (75%

within the category). When discussing the benefits of rural placement over the suburban campus-based clinic in the state capital city, 3 main themes emerged from the data: (1) a more diverse patient mix (33% within category), (2) greater development of diagnostic and therapeutic skills (47% within category), and (3) a larger volume of patients (30% within the category).

### Indigenous Interaction

Students felt positively influenced by the overall Indigenous experience (56% within the category) and believed that the placement promoted Indigenous appreciation (19% within category). The comments around interaction with Indigenous communities indicated a desire for this aspect of the placement to be enhanced and expanded (31% within the category).

According to 1 student,



**Table 3 - Practice Locations<sup>a</sup> of Chiropractic Students Who Graduated From MU Between 2006 and 2014<sup>b</sup>**

	<i>n</i> (% Rounded)			
MU graduates, 2006–2015	459			
Not practicing (5) + unknown (8)	13 (3%)			
In practice, 2016	446 (97%)			
MU graduates practicing internationally	41 (9%)			
MU graduates practicing in Australia by state				
Australian Capital Territory	1 (<1%)			
New South Wales	13 (3%)			
Northern Territory	2 (<1%)			
Queensland	26 (6%)			
South Australia	18 (4%)			
Tasmania	3 (1%)			
Victoria	18 (4%)			
Western Australia (WA)	330 (81%)			
Australian practice Total	405			
MU graduate practice in Australia by ASGS				
RA1	262 (65%)			
RA2	76 (19%)			
RA3	52 (13%)			
RA4	9 (2%)			
RA5	6 (2%)			
RA2–RA5 total	143 (35%)			
MU graduate practice in WA by ASGS	330			
RA1	218 (66%)*			
RA2	59 (18%)*			
RA3	39 (12%)*			
RA4	8 (2%)*			
RA5	6 (2%)*			
	112 (34%)*			
*As a proportion of MU graduates practicing in WA, RA2–RA5 Total				
	<i>n</i>	OR	OR 95% CI	<i>p</i> value
MU graduates practicing in country regions of Australia who went on placement	62	2.1	1.4–3.2	<.001
MU graduates in country WA who went on placement	49	2.1	1.3–3.5	<.002

<sup>a</sup> As of January–February 2016.<sup>b</sup> MU = Murdoch University; ASGS = Australian Statistical Geography Standard; RA = remoteness area; OR = odds ratio; CI = confidence interval.

“Having had little to do with Indigenous people in the past and the small amount of interaction I had being overwhelmingly negative, it was an eye opener to interact with very professional, friendly and capable Indigenous people in the setting that I encountered.”

### Intention to Practice in a Country Location

Three-quarters (74.5%) of students that completed the online survey indicated they would be more likely to practice in a country setting (with the remainder neutral and none less likely) as a result of their placement. The students who participated in the 2-week placement at Tom Price were significantly more likely than those who completed a 1-week placement in other locations to express a positive attitude toward future rural practice in their response to the open-ended qualitative question (difference 29%; 95% confidence interval [CI] = 15.2–41.2;  $\chi^2 = 18.7$ ;  $df = 1$ ;  $p < .0001$ ). All qualitative responses that indicated a change in attitude to nonmetropolitan health care and the profession's role in those communities were positive.

### Part B

The practice locations of MU chiropractic students who graduated between 2006 and 2014 are shown in Table 3. Of the 459 students who graduated from MU during this period, 446 (97%) were in practice as of January–February 2016, with 405 (88%) in practice in Australia. Of these, 330 (81%) had remained in Western Australia. Of the 142 MU graduates practicing in an Australian nonmetropolitan region, 62 (43%) had participated in a CIP (odds ratio [OR] = 2.1, 95% CI = 1.4–3.2,  $p < .001$ ). Among those students who completed Part A of the study, the odds of working in a nonmetropolitan region were slightly higher (OR = 2.5, 95% CI = 1.2–4.9,  $p < .001$ ).

Of the 53 students who participated in a 2-week placement at Tom Price, 17 (31%) subsequently practiced in a RA2–RA5 location; of the 99 students who participated in a 1-week placement at another location, 46 (47%) subsequently practiced in a RA2–RA5 location (Table 4); however, a chi-square test ( $p = 0.74$ ) failed to show a significant association between placement location and subsequent practice in a RA2–RA5 region ( $p = 0.1$ ), even when correcting for students who subsequently practiced overseas, left practice, or were unknown ( $n = 22$ ).

**Table 4 - National Practice Locations<sup>a</sup> of Chiropractic Students Who Graduated From Murdoch University Between 2006 and 2014 by Placement Location**

Placement Location	Practice Location <sup>b</sup>								Total	RA 2–RA5
	Metro (RA1)	Inner Regional (RA2)	Outer Regional (RA3)	Remote (RA4)	Very Remote (RA5)	International	Not Practicing	Unknown		
No	193	44	28	6	2	29	5	4	311	80
Tom Price (RA5)	29	11	4	0	2	5	3	1	53	17
Kununurra (RA4)	16	5	11	0	0	1	0	0	33	15
Geraldton (RA3)	12	5	4	1	1	2	0	0	25	11
Mount Magnet/Meekatharra (RA5)	9	5	2	0	0	1	0	0	16	7
Carnarvon (RA4)	6	6	3	2	1	4	0	0	21	12
Total	265	76	52	9	6	42	8	5	459	

<sup>a</sup> As of January–February 2016.<sup>b</sup> RA = remoteness area.**Table 5 - Western Australian Practice Locations<sup>a</sup> of Chiropractic Students Who Graduated From Murdoch University Between 2006 and 2014 by Placement Location**

Placement Location	Practice Location <sup>b</sup>					Total	RA2–RA5
	Metro (RA1)	Inner Regional (RA2)	Outer Regional (RA3)	Remote (RA4)	Very Remote (RA5)		
No	160	35	21	5	2	223	63
Tom Price (RA5)	22	10	4	0	2	38	16
Kununurra (RA4)	14	3	8	0	0	25	11
Geraldton (RA3)	12	3	4	1	1	21	9
Mount Magnet/Meekatharra (RA5)	5	2	0	0	0	7	2
Carnarvon (RA4)	5	5	3	2	1	16	11
Total	218	58	40	8	6	330	112

<sup>a</sup> As of January–February 2016.<sup>b</sup> RA = remoteness area.

According to Australian Health Practitioners Regulation Agency/Chiropractic Board of Australia listings in February 2016, chiropractors in nonmetropolitan Western Australia comprised 27% of practitioners in the state. Of these, 112 (77%) were graduates of MU, 49 (35%) of whom had undertaken a CIP (Table 5).

## DISCUSSION

This is the 1st study to explore the influence of clinical placements in nonmetropolitan locations on Australian undergraduate chiropractic student experience, profession-

al attributes, and employment destination. The findings of this study indicate that students who participated in a CIP in a nonmetropolitan location had a ubiquitously positive experience, with many reporting improvements across several professional attributes. Not only did students report from their perspective a more respectful and empathetic attitude and greater awareness of individual needs, they also indicated that the placements facilitated the development of important diagnostic and therapeutic skills beyond that developed through the campus-based clinic. These findings are consistent with previous studies of pharmacy,<sup>24,35</sup> dental,<sup>36</sup> and nursing students,<sup>37</sup> which

revealed that exposure to service learning and rural clinical placements have a positive influence on a student's clinical skills, knowledge, attitudes, and confidence. A logical progression of this work will be to explore whether these perceived improvements in clinical competency translate into meaningful improvements in student competencies and clinical patient outcomes and satisfaction.

Many of the students that completed a CIP in a nonmetropolitan location indicated an intention to practice in a regional location and, importantly, were more likely to practice in a regional setting after graduation. These findings corroborate the results of studies involving Australian medical graduates, which reveal that exposure to regional practice during educational placements is positively associated with a student's intention to become a rural doctor after graduation.<sup>38-40</sup> These studies, as well as those involving allied health students,<sup>41</sup> show that rural origin and the early intentions of practicing in a regional location at the commencement of clinical training are also strong predictors of future rural practice. While our study did not examine these latter outcomes, they should be the subject of future work on the chiropractic workforce. Work is also required to understand the influence of these clinical placements on the experiences of end users, including patients, the local community, and other service providers and stakeholders.

Our results also reveal some interesting insights with respect to nonmetropolitan placement duration and the decision to practice chiropractic in a regional location. While the reported intention to practice immediately following placement was consistent with the findings of other studies (e.g., a retrospective cohort study of Queensland medical graduates that found longer periods of clinical placement in the regional sector to be associated with higher odds of working in regional clinical practice<sup>38</sup>), this was not fully reflected in the actions of MU students after graduation. It is worth noting, however, that the "longer periods" of placement mentioned in the Queensland medical graduate study referred to a period of months, up to a year. One possible explanation for the enthusiastic feedback provided by students following chiropractic placement in our study may relate to a so-called voluntourism dynamic,<sup>42</sup> where the setting and the "adventure" of being in the outback may have impacted student responses. This explanation does, of course, warrant further exploration.

Student feedback regarding the frequency and timing of placements must be viewed in context with the requirements of the clinical practicum component of undergraduate chiropractic education. At MU, students are faced with the challenge of achieving minimum case numbers from *both* the campus clinic *and* outreach visits. Since nonmetropolitan placements typically provide increased patient volume in a short time, students who participate in these placements can meet their required case numbers in a relatively shorter period of time; that is, students do not need to be immersed in regional practice for any longer than 2 weeks to achieve their case volume requirements. For example, students placed in Tom Price (in the Pilbara region) have been observed to routinely conduct 80 to 100

patient visits each over the 2-week period. Given that longer and more frequent nonmetropolitan clinical placement periods would potentially benefit students and consumers in other ways (i.e., through the development and consolidation of necessary clinical skills and attributes),<sup>36,37</sup> as well as rural communities (i.e., by addressing health workforce maldistribution and building social capital), it could be argued that undergraduate chiropractic education providers have a professional, social, and pedagogical obligation to expose students to more extended periods of clinical immersion in regional locations.

Another consideration worthy of mention is the overall dynamics of the profession in Western Australia during the period of our study. In 2006, prior to the graduation of the 1st chiropractic cohort from MU, there were 281 registered chiropractors in practice.<sup>43</sup> By 2015, this number had swollen to 536. The growth in the number of chiropractic graduates and the number of chiropractors setting up practice in nonmetropolitan regions may therefore reflect a so-called saturation dynamic. That is, graduates may have simply recognized the opportunity of working in underserved nonmetropolitan areas, notwithstanding that those who took up this opportunity were over twice as likely to have been on a nonmetropolitan CIP. It is possible then that this may represent a situation where "opportunity meets preparation."

### Strengths and Limitations

While this study had a number of strengths (i.e., large student population, data from multiple cohorts over a 5- to 10-year period, novelty, and a high participation rate [Part A]), there are several limitations that are worthy of mention. First, while the study included all undergraduate chiropractic students enrolled at MU during the period studied (Part B), the findings may not be generalizable to chiropractic students enrolled in other institutions, other Australian states and territories, or internationally or to other disciplines. This is because there may be some important differences between various outreach placements. Second, the current study did not obtain data on rural origin (i.e., whether the student ever resided in a country region). In light of evidence suggesting that rural origin is a strong predictor of employment in a rural location,<sup>41</sup> plans are currently under way to investigate whether this association also holds true for nonmedical professions, such as chiropractic. Finally, as this was an observational study, we cannot state definitively that the CIPs directly affected student outcomes, only that there was an association between these 2 variables. These limitations should be taken into consideration when interpreting the findings of this study.

## CONCLUSION

Nonmetropolitan CIPs appear to offer numerous educational benefits for undergraduate chiropractic students, many of which can be difficult to achieve in a campus-based chiropractic clinic, such as diversity in patient case mix. These placements also appear to foster

communication and interaction skills, social responsibility, and a philosophy of caring. CIPs were highly valued by students in this study and may even influence students to practice in nonmetropolitan areas after graduation, which may be helpful in addressing the chiropractic health workforce maldistribution in Australia. Based on the findings of this study, clinical placements in nonmetropolitan locations should continue to be a vital element of any undergraduate chiropractic program. For universities that do not integrate outreach clinical placements into their curriculum, the findings of this study may provide an important impetus for considering such an initiative.

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Concept development: LAW. Design: LAW, BEL. Supervision: LAW, BEL. Data collection/processing: LAW, BEL.

Analysis/interpretation: LAW, BEL, MJL. Literature search: LAW, BEL, MJL. Writing: LAW, BEL, MJL. Critical review: LAW, BEL, MJL.

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