

REVIEW ARTICLE

Dental practitioner rural work movements: a systematic review

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A B S T R A C T

Introduction: There is a globally observed unequal distribution of dental and other health practitioners between urban and rural areas in OECD countries. Dental practitioners provide important primary healthcare services to rural populations. Workforce shortages and stability issues in underserved areas can have negative effects on rural communities. Strategies used to fix the dental practitioner workforce maldistribution need to be investigated.

Method: The study had primary focus on Australia and included relevant international literature. Databases used were PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Informit, Web of Science, Scopus and Summon. Search terms included *dental practitioner, rural, remote, retention, recruitment* and *strategies*.

Results: Sixteen articles met the inclusion criteria. The articles described a total of eight different positive factors and 12 negative factors towards rural practice. The positive factors related to the nature of the type of clinical work being a 'challenge', close social and professional support networks, enjoyment of rural lifestyle and successful integration into the rural community. The negative factors mentioned included social and professional isolation, workload and type of clinical work, access to further education opportunities, access to facilities, education for children and job opportunities for a partner, and inability to integrate into the rural community. The articles that analysed recruitment incentives described three strategies currently used to influence recruitment, all of which were financial or contractual in nature. Articles mentioning retention factors described seven long-term retention motivators; of these, six of them were personal reasons. The most commonly mentioned motivational factor for recruitment and retention of the rural dental practitioner workforce was the effect of prior rural exposure for dental practitioners.

Conclusions: The results of this review indicate that the most important influences on rural dental practitioner workforce recruitment and retention were a combination of financial reimbursement and personal reasons. There was also a large influence of rural medical workforce research on untested assumptions and drivers of the rural dental practitioner workforce. The high



recruitment rate compared with the low retention rate indicates that current strategies were not effective in addressing rural dental practitioner workforce shortages in the long term.

Key words: dental practitioner, motivation, oral health, recruitment, retention, review, rural workforce.

Introduction

There is a globally observed unequal distribution of health practitioners between urban and rural areas in OECD countries¹⁻³. Recruitment and retention of health practitioners is a common problem faced by rural communities⁴. Dental practitioners such as dentists, dental therapists, dental hygienists, oral health therapists and dental prosthetists/dental technicians provide important primary health care services to rural populations. Workforce shortages and stability issues in underserved areas can have negative effects on rural communities. Successful recruitment initiatives and long-term retention schemes for rural dental practitioners are important to improve the oral health of people in underserved areas⁵.

The problems associated with workforce stability of dental practitioners reflected those outlined in other health disciplines^{6,7}. It appears that, despite government intervention, the forces that attract and retain healthcare providers in metropolitan areas and the incentives from working there are unable to be matched by smaller communities⁶. Rural communities share some characteristics that can negatively affect the manner in which health care is provided⁸ and rural populations attend dental services less frequently than urban populations⁹. These characteristics can include increased geographic distances for travel between population centres and oral health services¹⁰. Population size can be limited so that effective care facilities are unsustainable, recruitment and retention schemes can be inefficient, management structures ineffective, and the possibly higher proportion of elderly, socioeconomically disadvantaged and Indigenous peoples and geographical isolation can combine to further disadvantage rural healthcare provision^{8,11,12}.

There is much existing literature investigating current recruitment and retention initiatives and the factors that influence medical personnel to move to and work in rural areas, despite the fact that rural health services generally encompass a variety of health disciplines¹⁰. To maintain a stable healthcare system, it is important to understand the characteristics of dental practitioner mobility and the factors that can influence recruitment and retention of practitioners^{13,14}. Thus, a systematic review was needed to better understand and synthesise the available evidence of the factors that influence dental practitioners' decisions to work and stay working in rural areas and the strategies engaged to facilitate recruitment and retention of the rural oral health workforce. The objective of this review was to increase understanding of dental practitioner workforce regional maldistribution, with focus on Australia. This review synthesised the available evidence on the recruitment and retention of the dental practitioner workforce in rural and remote areas.

Method

Review questions

1. What are the factors influencing dental practitioners' decisions to come to, stay and leave rural and remote areas?
2. What are the existing strategies for recruitment and retention of dental practitioners in rural and remote areas?

Search strategy

Literature was searched independently by two reviewers to find articles related to recruitment and retention factors of dental



practitioners in rural areas. While the study had a primary focus on Australia, it included relevant international literature for background context. Databases used were PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Informit, Web of Science, Scopus and Summon.

Key words

The key words/phrases used in the search included combinations of the following: *dentist, dental practitioner, dental professional, dental therapist, dental hygienist, oral health therapist, dental prosthetist, dental technician, dental laboratory technician, rural, remote, regional, recruitment, retention, workforce, intervention, strategies, inequitable distribution and professional mobility.*

Study criteria

The study criteria of the review are summarised in Table 1.

Inclusion criteria covered English-language studies and reviews in OECD countries between 1990 and June 2013. The rationale for the start year for the review was that health workforce shortages were identified at the end of the 1990s in many OECD countries¹⁵. Since then, this issue has attracted attention in both the academic literature and from government policy. Studies that included allied health professionals or primary health care workforce were only included if they specified the inclusion of at least one of the dental practitioner types outlined. The reference lists of included studies were hand searched for relevance. As there is no universally used definition of *rural* in the literature¹, this study used a commonsense approach to refer to rural communities based upon their distance from the nearest major city, access to amenities and resources and their population size¹⁶. In this study, recruitment referred to a newly employed member of an organisation and retention to the length of time between starting and finishing employment with a particular organisation.

Results

The results of the literature search are detailed in Figure 1. From an initial pool of 519 articles, 16 articles published in

the literature met the inclusion criteria. An overview of the findings on factors and strategies associated with recruitment and retention of dental practitioners in rural and remote areas is shown in Table 2.

Of these studies, eight were conducted in Australia, six in the USA, one in the UK, and one was a Cochrane Review. Of the eligible articles, four were retrospective studies using historic workforce data, two were literature reviews, eight were surveys, one was a mixed methods study, and one was a descriptive study. Regarding the type of dental practitioners, seven studies focused on dentists^{3,9,10,17-20}, one on therapists²¹, four on two or more dental practitioner types^{6,12,14,22} – most commonly dentists, dental specialists (such as orthodontists), dental therapists and dental hygienists grouped together – while the others focused on one or more dental practitioner types which then bundled together the results with other health disciplines^{16,23-25}. Noticeably, no studies addressed the dental prosthetists/technician's rural workforce distribution.

The studies reviewed focused on the dental practitioner workforce inclusive of practitioner types and their rural work movements in relation to attitudes, barriers and incentive schemes. Of the articles reviewed none focussed on the practice location motivators of dental practitioners on a grand or national scale. Australian research was the most commonly found in the review. Survey articles focused on influences and motivational factors of the rural work movements of dental practitioners, each had narrow focus on the particular geographical region of practice, graduating university and/or timeframe.

There were three literature reviews: two from Australia and one international Cochrane Review. One Australian review identified the motivational factors of dental practitioners and other health professionals towards rural practice¹⁶. The Cochrane Review focused on the effectiveness of rural engagement strategies aimed at increasing and stabilising the rural health workforce²⁴. The review found that 13 studies made reference to other health disciplines' rural health workforce research and assumed that the theories from these studies were applicable to the rural dental practitioner workforce^{3,6,9,10,12,20,22-25}.



Table 1: Inclusion and exclusion criteria

Criterion	Inclusion	Exclusion
Time period	1990–June 2013	Historical literature
Language	English	Non-English
Place of study	Australia and Organisation for Economic Cooperation and Development (OECD) countries	Developing countries
Setting	Rural and remote areas	Urban or metropolitan areas
Participants	Dental practitioners (dentists, dental hygienists, dental prosthetists, dental therapists and oral health therapists)	Dental students before graduation

Table 2: Factors and strategies associated with recruitment and retention of dental practitioners in rural and remote areas

Author and year	Country	Objectives	Methods	Subjects	Practitioners	Outcomes
Bazargan et al. 2010 (ref 17)	USA	Investigated a strategy aimed to increase area shortages: foreign-trained dentists	Historical data	688	Dentists	Unlikely to increase workforce in vulnerable areas
Bazen et al. 2007(ref 18)	Australia	Investigated the effects of rural placement on rural practice	Survey	Unknown	New dental graduates and students	Inconclusive if rural placement during university will increase the likelihood of rural practice
Campbell et al. 2012 (ref 16)	Australia	Identified motivators of health practitioners towards working in rural areas	Literature review	35 articles	Dentists, hygienists, therapists, allied health professionals	Identified factors that can lead to high staff turnover and decreased job satisfaction
Daniels et al. 2007 (ref 24)	USA	Identified factors associated with recruitment and retention in the rural health workforce	Survey	1135	Hygienists, allied health professionals	Health professionals from rural backgrounds and with increased age at graduation were more likely to work in rural areas/also identified important social factors and attitudes
Grobler et al. 2009 (ref 25)	International	Assessed the effectiveness of interventions to increase recruitment and retention of the rural health workforce	Cochrane Review	No articles fit the selection criteria	Dentists, other health disciplines	No articles that supported interventions aimed to increase the dental practitioner workforce were free of bias
Hall et al. 2007 (ref 12)	Australia	Identified factors influencing work movement decisions	Interview and survey	63	Dentists, dental specialists, therapists, hygienists	Prior rural experience influenced rural practice. Social factors were important for long-term retention. Financial incentives attracted workers in the short-term
Kruger et al. 2007 (ref 21)	Australia	Analysed the reasons for dental therapists leaving the profession with focus on rural and remote areas	Survey	253	Dental therapists	Increased salaries, living support, travel assistance, access to continuing education, recruitment of more rural students and more flexibility may increase retention and recruitment of dental therapists in rural areas



Table 2: cont'd

Author and year	Country	Objectives	Methods	Subjects	Practitioners	Outcomes
Kruger & Tennant 2004 (ref 14)	Australia	Assessed demographics of Australian dental practitioners	Survey	168	Dentists, hygienists, Therapists	Outlined generalised profile of rural dental practitioners.
Kruger & Tennant, 2005 (ref 6)	Australia	Investigated the influences of rural practice and retention factors	Survey	168	Dentists, Hygienists, therapists	Lifestyle was the most common factor that attracted respondents to rural work. Responses differed from male to female
McFarland et al. 2010 (ref 19)	USA	Investigated rural background effect (Historical data	879	Dentists	Dentists with prior rural exposure were more likely to work in rural practice
McFarland et al. 2012 (ref 20)	USA	Tested hypothesis of rural background effect	Historical data	1361	Dentists	Dentists with rural backgrounds were more likely to work in rural practice
Renner et al. 2010 (ref 3)	USA	Investigated whether student loan repayment programs had an impact on where a health professional works	Survey	93	Dentists	The loan repayment schemes had little influence on rural practice
Richards et al. 2005 (ref 23)	UK	Investigated the key 'predictors' of rural practice	Survey	1077	Dentists, dental nurses, other health practitioners	Health practitioners with rural background were more likely to work in rural practice. Social isolation and access to facilities were negative influences of rural practice
Silva et al. 2006 (ref 9)	Australia	Investigated the factors that influenced practice location	Survey	109	Dentists	New graduates often worked in underserved areas in order to increase their clinical skills
Skillman et al. 2010 (ref 10)	USA	Identified challenges to oral health in rural America including workforce stability	Descriptive article		Dentists	Identified requirements for rural oral health such as flexibility and resources. Increased focus on prevention and cross-discipline approaches
Smith & Tennant, 2006 (ref 22)	Australia	Investigated the dental workforce in Western Australia	Historical data	1101	Dentists including specialists	More dentists were registered in metropolitan areas. Local graduates were more likely to practice in area compared with other graduates

Rural background and rural placement experience

Prior rural exposure was a common theme in the literature; it was suggested to be the most influential factor in determining the probability of rural practice recruitment and retention for dental practitioners. This term encompassed hypotheses that dental practitioners with a rural upbringing^{20,26} or had participated in rural placement programs during their training^{18,19} were more likely to work in rural practice and for longer periods of time than their urban counterparts.

Positive and negative motivational factors

Nine of the reviewed studies outlined positive and negative motivational factors influencing decisions to work in, remain working in or leave rural practice. Of these studies, 10 outlined positive factors towards rural practice. The most commonly reported positive influences of rural practice were a wide range of challenging clinical exposures^{6,12,16,18}, increased clinical and administrative experience^{12,16,18}, enjoyable patient base¹⁸, appropriate salary remuneration^{16,18,21}, personal and professional support networks^{3,9,16,20,23}, and successful integration into the community and the enjoyment of rural lifestyle for both the individual and their family^{3,6,12,19,20}.

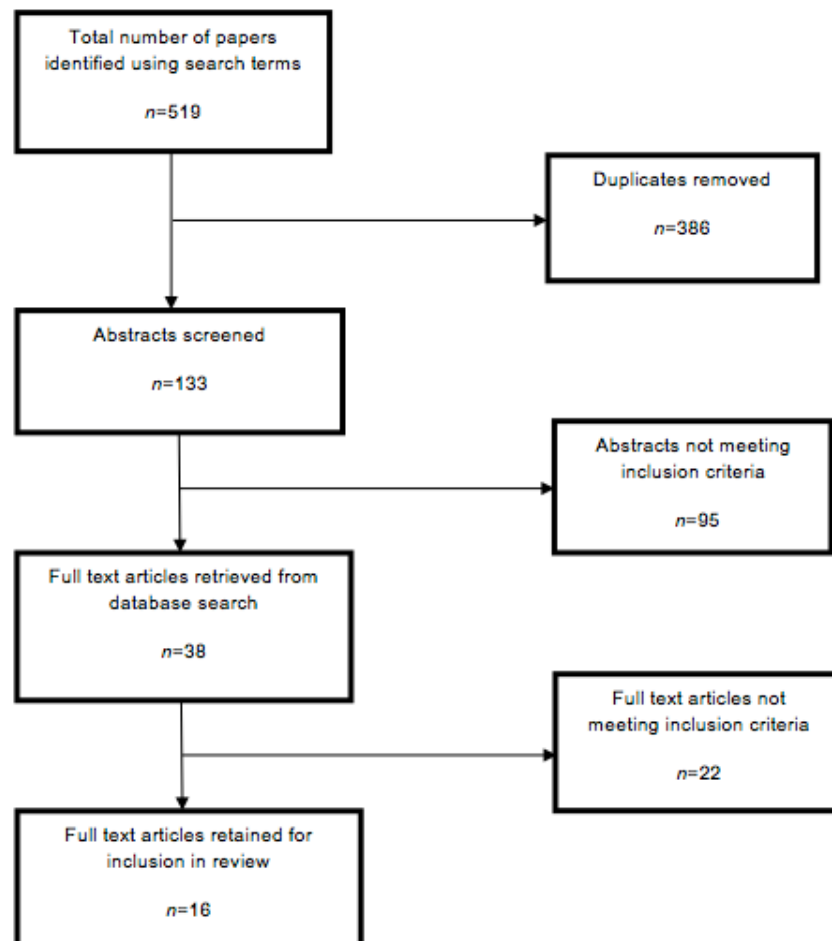


Figure 1: Search strategy results.

The most commonly reported negative aspects of rural life were social and professional isolation^{6,9,14,16,18,23,25}, limited access to facilities and activities^{6,18,25}, increased workload and inadequate time off duty^{6,12,21}, type of clinical work undertaken¹², access to further education and professional development opportunities^{16,21}, access to education for children^{6,25}, limited job opportunities for the individual or their partner^{3,6,9,12}, their own or their family's dissatisfaction with rural lifestyle and inability to successfully integrate into the rural community^{3,6,12,17,18,21,23}.

Strategies

Ten articles investigated strategies aimed at increasing recruitment of dental practitioners into the rural health workforce. The majority of the strategies outlined were financial in nature²⁴. The US strategies included were the increased use of foreign-trained dentists in rural areas¹⁷, and student loan repayment schemes to encourage new graduates to work in rural areas^{3,17,19,23}. Australian strategies included were increasing salaries and financial remuneration^{6,9,12}. The



international strategies included were increased financial remuneration²⁴.

The most commonly mentioned factors influencing retention were social and personal issues, related to the successful formation or pre-existence of strong social bonds to the particular community and enjoyment of rural lifestyle^{3,6,9,12,18,23-25}. The strategies aimed at the retention of rural dental practitioners identified in this review were focused on successful integration into rural communities and rural lifestyles through increasing rural exposure. The strategies included were increasing the number of dental students at universities with rural upbringings^{9,20} in Australia and internationally; rural placement programs during training^{18,20,24} in Australia, internationally and in the UK; and increasing dental school locations in rural locations^{19,24} internationally and in the USA. Other factors influencing rural recruitment and retention were desire for a rural lifestyle^{6,12,18,23}, challenging job opportunities^{6,16} and increased exposure to a wide range of patients and increasing clinical skills^{6,9,12,16}.

Discussion

The main finding of this review was that there was little comprehensive or definitive research into the influences on the work movement decisions made by dental practitioners. This review found many of the studies that fit the review criteria to be unable to comprehensively describe or investigate motivational factors beyond the boundaries of particular geographical areas or timeframes. They were also unable to measure the long-term effectiveness of any of the interventions implemented to address the maldistribution of the dental practitioner workforce between metropolitan and rural areas. The lifestyle, social, political, economic and cultural environment of rural communities is vastly different from that of metropolitan areas and the geographical, demographic and social landscapes of rural communities changed between different areas¹². Rural communities share some characteristics that can negatively affect the manner in which health care was provided, such as the overall difficulty

in providing adequate care for populations with limited resources¹⁰. The problems associated with workforce stability of the rural dental practitioner workforce reflected those outlined in other health disciplines^{6,7}. Despite government intervention to increase the number of health professionals working in rural areas long-term, there remained no definitive evidence that these had been successful^{7,24,27,28}. The limited number of studies into this topic was seen by the fact that more than three-quarters of the studies reviewed made unproven assumptions. Motivators for medical doctors to work and remain working in rural areas were also true for the dental practitioner workforce^{3,6,9,10,12,16-18,20,22-25}.

Taking a step back from the particular differences between rural medical and dental practice⁹, and generalising the motivational factors towards healthcare provision in rural communities, several similarities appear. The most notable is the influence of the enjoyment of rural life through good personal relationships and community integration^{9,12,25}. For example, an Australian study²⁹ outlined the most important factors influencing medical practitioner's decisions about rural practice including professional issues, social factors relating to personal characteristics, family situation and external factors relating to community and geographical location²⁹. These factors were found to be similar to the motivational factors of rural dental practitioners¹². However, these results have not been tested in the dental practitioner workforce on a grand scale or in the long term. Another Australian study³⁰ of rural allied health professionals found that patterns of recruitment and retention varied across health discipline. Whereby depending on the profession, predicted length of stay could vary by up to 2.5 years, in particular podiatrists (18 months) and social workers (4 years)³⁰. The similarities between motivational factors for the rural medical workforce and the rural dental practitioner workforce remain untested, despite the shared assumptions seen in the mirrored strategies used in both health disciplines. There was disputed evidence of the long-term effectiveness of these strategies²⁴. Although each individual study reviewed had a small sample size and limited scope, together they displayed similar results in terms of the factors that influence the recruitment of dental practitioners to rural practice.



The most commonly identified rural practice motivators for health professionals primarily related to an individual having positive experiences of rural life prior to moving into a rural community for work. The term *prior rural exposure* was used to describe the influence of rural upbringing, participation in undergraduate rural placement programs, and having a partner with a rural background^{12,16,23}. This exposure could provide dental practitioners with knowledge and experience of the realities of living in rural areas as well as experience of the clinical and administrative expectations of working in rural areas¹⁸. Positive experiences could influence both recruitment and retention¹⁸. Dissatisfaction with rural practice can stem from the failure of rural life to meet expectations. Arguably, the strongest driver for rural practice among medical doctors is rural background of the individual^{1,31-33}. This is called the rural background effect^{32,33}. It has been suggested that it could be twice as likely for a rural background medical student to work in rural practice as an urban background student³⁵. Familiarity and experience of rural environments and cultures played an important part in the decision-making process surrounding rural practice for dental practitioners^{25,36}, general medical practitioners^{29,37,38}, nurses³⁹ and other health professionals^{28,36,37}. However, dental practitioner workforce studies that investigated whether the rural background effect was significant found mixed results. Several^{9,20,25} concluded that it was heavily influential on long-term rural retention, while others^{3,12} found that it had little influence on long-term retention.

The reasons behind the rural background effect are unknown. Jones et al³² suggested that it could be due to an increased ability to socialise and acculturate to the rural environment and the pre-existence of local social support networks. Individuals who displayed uncertainty towards working in rural communities could do so because of unfamiliarity with the rural lifestyle³³, so prior experience of rural life can facilitate the ability to assimilate³². As a result of this, there were strategies in place to increase the number of rural student placements in health service university courses^{10,36}, and by increasing awareness and useful information about health careers. Examples included the Rural Student Program in Australia²⁶ and the University of Washington's School of

Dentistry's Regional Initiative in Dental Education (RIDE) program¹⁰ in the USA. This experience was thought to promote positive attitudes and provide students with realistic expectations of rural practice^{18,40}. Some studies^{19,28} found that dental students who worked in rural areas after graduation were more likely to remain in or close to the rural area in which the rural placement was conducted or where the university was located. Whilst most of the medical workforce studies remain unproven in the long-term and free of bias, their preliminary findings should be considered highly relevant to this topic.

No definitive line between the determinants of recruitment and retention was drawn in the literature. Many strategies focused on recruitment and not retention⁹, often to the detriment of the long-term health workforce of rural communities⁹. The present review found that most rural recruitment strategies were financial²⁷. Financial and contractual incentives such as loan repayment schemes and visa conditions were effective at increasing recruitment and short-term retention, but were unable to provide enough incentive to influence long-term retention^{3,17,23,24,27}. It was found that a combination of job and lifestyle satisfaction influenced long-term retention¹². The differences between drivers of rural recruitment and retention exist because decisions that influence recruitment were made outside the context of actual rural practice³⁸. Retention decisions were made within it and were based on knowledge from personal experience³⁸. Therefore, aiming to increase rural recruitment will not by default lead to increased workforce retention. Evidence on successful long-term rural dental practitioner workforce retention strategies was limited^{24,27,41}.

The factors that influence retention were complex²⁸ and individual factors should not be considered separately from other influences^{12,42}. Retention of health workers was thought to be influenced by various factors, including but not limited to job satisfaction^{12,29,43}, career satisfaction^{12,43}, group cohesion and management¹², professionalism and autonomy¹², cultural needs⁴⁴⁻⁴⁶, education opportunities^{38,44,46}, and contentedness of family^{45,46}. The multidimensional complexity of healthcare provision meant that interrelated



factors like personal contentedness and enjoyment of the social, economic, political and cultural environment all played important parts in retention rates^{28,43}. Several studies^{12,25,47} indicated the importance of community involvement and enjoyment as key in ensuring health workers remained in rural practice long term. This can be seen in the retention of foreign-trained dental practitioners¹⁷ because one of the most important factors of long-term retention in these situations was the successful integration of the individuals and their families into the community^{23,46}. When individuals become lonely or isolated without close support networks, they left, irrespective of how much money was offered. Many other factors influencing rural workforce retention and recruitment were unable to be fully investigated by this study, such as ageing populations and their changing dental requirements⁴⁸, an increased female oral health workforce⁴⁹, cultural differences and language barriers¹⁷, and life-stage expectations^{22,50}.

The influence of the changing nature of workforce trends across the board was evident in different age groups seeking different things from their employment opportunities⁴. Several wider health discipline studies suggested that very few students envisaged their careers to remain in only one place for the entire length of their career^{51,52}, creating further challenges for recruitment and retention strategies. The nature of health workforce sustainability is complex; strategies should not address one singular aspect of the issue. They should be adaptable in order to be able to address the changing needs of dental practitioners¹¹. Research into such strategies does not yet exist to provide a useful tool for such a comprehensive solution. It would be misleading to assume that strategies aimed at improving health workforce issues in one area would by default also work for other rural areas¹². Suggestions for improved rural oral health service delivery not covered in the review included the increased use of telemedicine and teledental services⁵³, outreach or periodic visiting health services, better health promotion and education, increased domiciliary support, better service integration between health services and disciplines, improved transport options and financial subsidies¹¹. This article provides a focused review into the rural dental practitioner

workforce independent of other health practitioner types, such as allied health professionals. Previous literature reviews into the rural dental practitioner workforce combined several rural health disciplines providing generalised findings. As a result of this specification, this article found that all of the ideas, theories and current strategies relating to the subject of an unequal distribution of the international dental practitioner workforce are firmly based on those from the rural medical workforce literature without any real proof of the relevance of these ideas.

Several limitations characterise this review. The review was unable to quality assess each of the included studies using a priori quality assessment tool due to their limited focus and scope, and their mixed discipline results. Many of the studies focused solely on dental practitioners who were working in specified geographical areas, or graduated from particular universities during limited time frames^{3,9,12,14,18,19}. Several other studies grouped the dental practitioner types together or with other health disciplines^{16,23-25} so they were unable to provide a definitive discussion of dental practitioners' rural work movements, simply an overview of generalised health disciplines. Another limitation of the study is that grey literature was not included in this review.

Conclusions

The limited number of studies into the maldistribution of the dental practitioner workforce between metropolitan and rural areas suggested that further, more comprehensive, research is required to investigate the issue – covering all dental practitioner types in detail, and independent of other health disciplines. The studies reviewed were unable to comprehensively describe or investigate the motivational factors influencing rural practice beyond the boundaries of particular geographical areas or timeframes or to measure the long-term effectiveness of any of the interventions. However, the studies share some characteristics. Most of the current recruitment incentives were financial and contractual in nature, even though their ability to influence long-term workforce stability remained unknown and were suggested to



actually increase turnover, because the most influential long-term retention factors for rural practice were personal.

This review uncovered one important question that remained in the international dental practitioner workforce literature. How relevant were assumptions made from the rural medical workforce studies in explaining the patterns seen in the rural dental practitioner workforce? An individual's prior rural exposure experiences were considered by many medical workforce studies to be the most influential factors towards the predictor of long-term rural workforce retention. The most important of these was arguably rural upbringing of the individual²⁰. However, the dental practitioner workforce literature was contested on the subject^{3,9,12,20,25}. The relevance of rural practice motivators for the medical workforce to those of the rural dental practitioner workforce requires further testing. Better understanding of the determinants of workforce choice for dental practitioners will enhance service delivery through the provision of a more stable and accessible workforce³.

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