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A call to greater inclusion of gerodontology in the dental curriculum: A narrative review

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CONFLICT OF INTEREST

The authors have no conflict of interest

ABSTRACT

Aim: This literature review explores the need for greater prominence of gerodontology in the undergraduate dental curriculum, focusing on the significance of gerodontology for dental students on clinical placements.

Background: As Australia's population ages the number of dentate older people is increasing. An assessment of the dental profession's preparedness, including that of future providers, is needed to ensure that this public health issue is addressed.

Methods: A database search was performed in MEDLINE (Ovid), CINAHL and JCU OneSearch. Of the 41 articles identified, 31 were selected for review using a narrative approach.

Discussion: Of the 31 articles reviewed, 12 were Australian, 9 North American and 5 European. Five overarching themes were identified, including preparedness for residential aged care facilities; barriers to oral health services provision; attitudes to aged care; gerodontology as part of a dental school curriculum and service-based learning.

Conclusion: There are differences in the gerodontology curricula of dental schools, with a wide variation of clinical exposure to older patients. There is evidence that exposure to gerodontology curriculum prior to treating older people may help dental students feel more prepared for managing patients in aged care. The current marginal status of gerodontology in dental school curricula is in need of review.

Keywords: Aged care, clinical placement, curriculum, dental education, gerodontology.

Abbreviations and acronyms: RACFs = residential aged care facilities; WHO = World Health Organization.

INTRODUCTION

Australia's ageing population is increasing and with it the proportion of dentate older people in residential aged care facilities (RACFs).¹ An increasing life expectancy brings with it increasing oral health problems² since improvements in dental materials and restorative techniques have enabled tooth retention.³ Sussex *et al.* (2010) found that changes in societal values and understanding of oral disease have also been key drivers in reducing normalization of

edentulism.⁴ Dental care is particularly important as oral diseases and comorbidities tend to be more complicated and cumulative, more complex with age and frailty⁵ and associated with higher public health expenditure.⁶

In response to this international public health issue, the World Health Organization (WHO) has submitted a 'Call for Public Health Action' for the oral health of older people.² This narrative review explores the need for greater emphasis on gerodontology in the dental curriculum with the expected outcome of critically reviewing clinical placements, and improving skills, attitudes and knowledge in aged care dentistry.

METHODS

This literature review assesses articles, taking a narrative approach.⁷ The aim was to obtain a broad perspective to promote discursive consideration of the subject. The search strategy used the electronic data-bases MEDLINE (Ovid), CINAHL and JCU One- Search (Fig. 1). Search terms and words included 'aged', 'nursing homes', 'homes for the aged', 'dentistry', 'education, dental', 'schools, dental', 'service- based learning' and 'clinical and/or train/school/work/ setting'. Articles involving dental students, dental hygienists, oral health therapists and dental therapists were included (Table 1). Of 41 articles identified, 31 were selected for inclusion (Fig. 1). In addition, reference lists and hand-searching revealed key articles including papers by Hearn & Slack-Smith^{8,9} and Hopcraft *et al.*³

Fig. 1 Flowchart of search method.

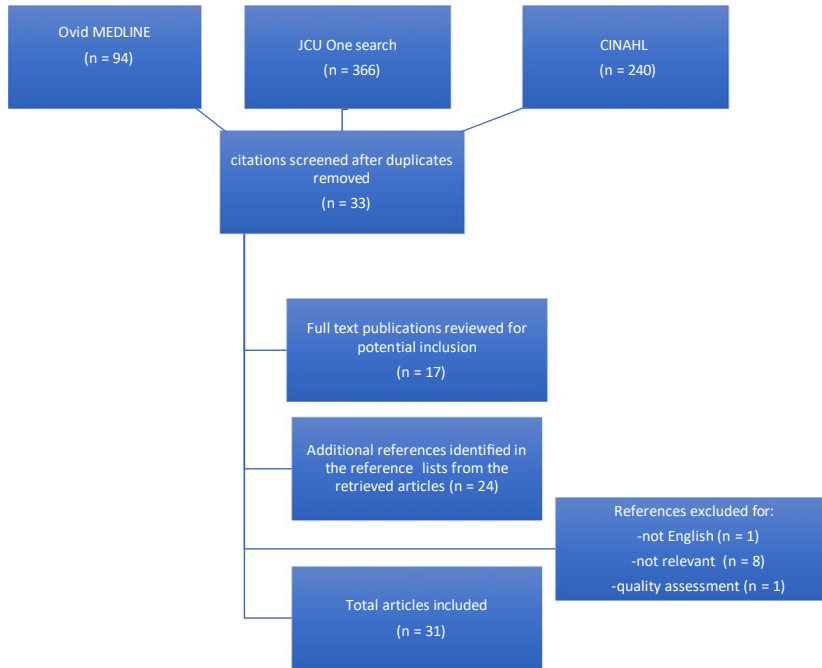


Table 1. Table of exclusion and inclusion criteria

Included	Excluded
Studies from 2000 written in English	Studies older than 2000 or not written in English
Related to gerodontology	Studies not centred around geriatric care
Related to clinical placements in RACFs	Studies with only abstract
Undergraduate curriculum	Non-peer-reviewed journals
Full text	Government reports;
Peer-reviewed journals	Theses

DISCUSSION

Of the 31 articles reviewed, 12 were based on Australian data. There were three articles from Germany, Belgium and USA that addressed dental students' aged care curriculum with clinical placements as part of a programme. Three main themes were identified in the literature: attitudes to aged care; gerodontology as part of a dental school curriculum and service-based learning. Five overarching themes which emerged from reviewing the literature were as follows:

- (i) preparedness for RACFs;
- (ii) barriers to oral health services provision;
- (iii) attitudes to aged care;
- (iv) gerodontology as part of a dental school curriculum and
- (v) service-based learning.

These themes were linked to each other in the studies, and so a narrative approach to discussion of these themes has been adopted.

(i) Preparedness

As dental school curricula change to accommodate new materials and clinical techniques, there is also a need for an evaluation of gerodontology in the under-graduate curriculum to adequately prepare dental students for the demands of the changing demographic profile.¹⁰ Shah,¹¹ Waldrop *et al.*,¹² Wallace *et al.*¹³⁻¹⁶ and Lee *et al.*¹⁰ indicated a need to prepare health providers for the inevitable need for dental care provision for older people. Under the Accreditation Standards for Dental Practitioners Programs prescribed by the Australian Dental Council, the inclusion of aged care is one of the requirements and specifies students gaining clinical experiences (Australian Dental Council, 2017); however, there is no requirement to include gerodontology as a stand-alone subject.

The changing demographic profile of Australia has had little effect on the provision of education and services, regardless of the growing problems identified in aged care oral health services. The value of service learning in RACFs has been documented, as has the need to address dental student pre-placement understanding of gerodontology and RACFs could ensure the students' comfort in a potentially new and confronting environment while facilitating maximized active learning.^{14,15} Prepared students have been found to gain more from a clinical placement than from didactic learning alone.¹⁶ Another study found dental student comfort increased and strategies of care changed with educational interventions.¹²

The majority of studies suggest overall positive effects associated with pre-placement education, but one study found no improvement in student knowledge. A greater need to promote positive perceptions about older people in order to develop dedication to their long-term care was noted.¹⁷

(ii) Barriers to care provision

Fifteen of the reviewed papers (Table 2) discussed barriers to the provision of oral health care to older people.^{1,5,6,8,9,11,12,17-24} Following the work of Hopcraft *et al.*,¹ Hearn and Slack-Smith⁹ emphasized multiple barriers, including undergraduate training. This was affirmed in the systematic review conducted by Bots-VantSpijker *et al.*,²⁵ which investigated perceived barriers to provision of care to older people by dentists. The limited inclusion of gerodontology in dental school curricula has been highlighted¹⁸ and is one of the many barriers to adequate oral health care provision for older people. This is supported by a recent review into the status of dental school curricula on gerodontology which emphasized that there is a wide international variation in clinical experience, with it ranging from none at all to immersion in different clinical environments.¹⁹ The lack of time that dental schools are able to give to this discipline may contribute to the inconsistency in the inclusion of gerodontology in the curriculum.²⁰

Another barrier oral health provision for older patients is dentists' reluctance to work in an environment they find stressful, unhealthy and isolated.⁸ One study found that inadequate undergraduate geriatric education contributed significantly to the disinterest of dental practitioners in providing dental treatment in RACFs.¹ Methods for overcoming barriers may include a more collaborative model of care involving dental students with increased emphasis on aged care oral health education.⁹ An increase in student exposure to geriatric care in the undergraduate curriculum may help to encourage further postgraduate study in this discipline.¹¹

(iii) Attitudes to provision of dental care to the aged

Although competence in gerodontology may be gained by a focus on knowledge, skills and attitudes,²¹ there is a need to develop student affective learning since the psychosocial management of older patients is of relevance due to the greater experience of chronic pain and other comorbidities in this cohort.²² Assessment of the attitudes of dental students to aged care is relevant to the design of gerodontology curricula because this may influence their

willingness to provide care.²³ Exposure to older patients in clinical settings has been found to be critical in shaping these attitudes.²⁴ Similarly, Wolff *et al.*¹⁹ and Annear *et al.*²⁶ agree that sufficient experiences with older people may influence attitudes and willingness to provide dental care.

Clinical placements may lead to an improvement in attitude to providing oral health care to residents by decreasing barriers between the dental professionals and RACFs.²⁷ The inclusion of experiential learning through clinical placements within RACFs may also improve students' attitudes to working with older patients and increase their knowledge of issues such as dementia.²⁶ Conversely, a study of Belgian undergraduate gerodontology curricula found that participation in an education programme that was specific to RACFs did not change the students' attitudes to institutionalized older people.²⁸ However, it was noted that the sample size used for the study was low, and there was a large variation in the approaches among undergraduate curricula investigated. A 30-year review of a geriatric dentistry programme in Iowa also found that measuring student confidence in treating older patients was a better predictor of willingness to treat than measuring attitudes.²⁹ The results from the studies indicate that an improvement in students' attitudes and confidence as a result of aged care learning may positively influence their willingness to provide care to older people.²¹⁻²⁹

(iv) Gerodontology in the undergraduate curriculum

As part of an undergraduate education programme, an aged care curriculum based on clinical placements would support the World Health Organization's advocacy for interprofessional education to support the need for oral health care in older populations.²⁴

No data are available on the current status of undergraduate gerodontology training in Australian dental curricula.

Currently, there is no accredited programme in Australia for the specialization of geriatric dentistry. As a subject, it is incorporated into the Doctor of Clinical Dentistry in Special Care Dentistry or Special Needs Dentistry. There is wide variation in the inclusion of gerodontology into the undergraduate dental curriculum.¹ This is also reflected in dentistry in the United States, where there is a need for competence guidelines in aged care training.^{30,31} Four studies investigating the inclusion of gerodontology into dental undergraduate education in North

America highlighted the need to increase training to better prepare future clinicians to care for older patients.^{19,20,30,31}

The Bologna Declaration allowed countries in Europe to commit to commonly agreed objectives for greater consistency of knowledge, mutual sharing of education and a more collaborative approach to teaching dentistry.³² However, this has not translated into practice with gerodontology, because there is still scope to improve the opportunities for undergraduate students to be trained in the oral health of older people.³³ Kossioni *et al.*,³³ Nitschke *et al.*²¹ and Preshaw & Mohammad³⁴ all assessed the status of gerodontology curricula for European dental schools and found that, while there has been an increase in facilities providing training in this discipline, it was inadequate for an ageing population.

(v) Service-based learning.

This review found ten papers that addressed clinical placements for health professional students,^{13–17,19,23,26,35,36} with three US studies specifically examining dental students (Table 2). There were four service-based learning studies from Australia, with all four investigating dental hygiene students. One study investigated a clinical placement pilot in aged care with Australian nursing students. There were no Australian reports from studies of dental students' clinical placements with older patients.

Annear *et al.*²⁶ found that attitudes and knowledge of dental students improved after gaining clinical experience; however, Wallace *et al.*^{13,15} found that final year dental students felt overwhelmed by attending RACFs on clinical placement without an adequate pre-placement programme. A study of European dental school curricula underlined the importance of students gaining experience in older patient's oral health care outside of the dental school in remote locations, in order to meet the increasing need of access to domiciliary dental care.³⁴

A greater emphasis on aged care education for clinical placements may affect future workplace decisions after graduation.³⁵ A study investigating dental students on a geriatric clinical rotation discussed the evaluations from the students on completion of the rotation but did not explore their willingness to provide treatment following graduation, and neither did it include an aged care curriculum as part of the clinical experience.³⁶

CONCLUSION

The available literature for review was mostly descriptive and qualitative, limiting the ability to make concrete comparisons. It is widely acknowledged that more clinical exposure to aged care oral health at an undergraduate level could positively influence student learning outcomes. There is no consistent inclusion of a gerodontology curriculum in dental schools, and there is a wide range of clinical exposure to older patients among dental schools. The barriers to providing oral health care to older patients are multifactorial and may be amenable to educational interventions. Inclusion of an aged care curriculum prior to providing treatment may help students to feel more prepared.

The nature of funding in Australia for dentistry has led to a fluid policy environment with dental schemes that do not reward dentists for preventing disease or maintaining good oral health. There is a clear need for funding of older people's oral health care with the potential to increase the workforce available to care for geriatric oral health problems.

Current gaps in the available recent literature include the perceptions of undergraduate dental students towards aged care within Australia, or information on the knowledge and attitudes that Australian undergraduate dental students gain in having aged care dentistry included in the dental school curriculum. There are no Australian studies investigating a gerodontology curriculum as part of an undergraduate clinical placement for dental students.

Future research should address the paucity of studies of gerodontology curricula in undergraduate dental programmes. Useful research may involve investigating student attitudes, skills and knowledge after the inclusion of a gerodontology curriculum as part of service-based learning.

Table 2. Table of publications included in literature review

Author, Date findings	Aim	Location	Participants	Study design	Major
Abbey <i>et al.</i> (2006) ³⁵	To determine what elements of aged care placements can yield a positive outcome	Australia	Nursing students	Descriptive qualitative pilot study	Clinical placement experiences can impact future work decisions
Annear <i>et al.</i> (2016) ²⁶	To investigate attitudes to RACF placements	Australia	Medical students	Mixed methods	Aged care placements can enhance student attitudes and knowledge
Bardach & Rowles (2012) ³⁰	Update on geriatric education in health professions	USA	7 health profession disciplines within academic medical centre	Qualitative	Multiple barriers found to enable improvement in geriatric education
Bots-Vantspijker <i>et al.</i> (2014) ²⁵	To identify barriers of delivering oral health care to older people experienced by dentists			Systematic literature review	Multiple barriers found including inadequate training and experience
Britton <i>et al.</i> (2016) ²⁷	To investigate dental professionals' perceptions of barriers and enablers to providing oral care in RACFs	Australia	5 dentists, 3 oral health therapists, 9 dental students	Qualitative	Interprofessional and innovative approaches can improve health outcomes
Ch'avez & LaBarre (2004) ³⁶	To discuss an outreach geriatric clinical rotation for undergraduate dental students	USA		Descriptive	Clinical placements at RACFs can provide service to underserved communities
De Visschere <i>et al.</i> (2009) ²⁸	Perceptions of recent dental graduates of impact of undergraduate dentistry education on knowledge and attitudes to RACFs older people	Belgium	124 recent graduate dentists from 6 Belgian dental schools	Descriptive and analytical	Gerodontology education and training programmes in RACFs did not influence the attitude of recent graduates towards institutionalized older people Attitudes and knowledge of recent graduates to aged and ageing are poor
Ettinger (2012) ²⁹	A 30-year review of a geriatric dentistry teaching programme at the University of Iowa	USA		Descriptive	No dental school is the same but generalized concepts advised including integration and multidisciplinary approach to teaching gerodontology
Ettinger <i>et al.</i> (2018) ³¹	Re-examination of geriatric dentistry education and identification of curriculum content	USA	56 USA dental schools	Quantitative	51.7% of schools had some form of compulsory undergraduate clinical education in geriatric dentistry. Curriculum is varied widely.
Fabiano <i>et al.</i> (2005) ¹⁷	An assessment of dental students' knowledge and beliefs about older people before and after the first year of a new educational programme	Buffalo, USA	202 dental students from the University of Buffalo School of Dental Medicine	Quantitative	43% of schools provided training at remote locations. 14% had received formal training in gerodontology

(continued)

Table 2 *Continued*

Author, Date	Aim	Location	Participants	Study design	Major findings
Foltny (2015) ⁵	A discussion of problems and barriers faced in aged care oral health	Australia		Narrative	Australia is unprepared for the growing problems encountered and increasing in oral health for older people
Hearn & Slack-Smith (2015) ⁸	Identify barriers of engagement of oral health providers in RACFs			Literature review	Multiple barriers with an urgent need for international action to reduce barriers of engaging providers
Hearn & Slack-Smith (2016) ⁹	Exploration of RACF staff perspectives on how to engage dental professionals for provision of care in RACFs	Australia	30 female RACF staff from 6 Australian RACFs	Qualitative	RACF staff agree that a collaborative model of oral care is needed with greater emphasis on geriatric dental education
Hopcraft <i>et al.</i> (2008) ¹	An investigation into the attitudes of dentists and directors of nursing (DONs) towards dental care for residents of RACFS	Victoria, Australia	125 DONs 122 dentists	Mixed methods	Low level of interest and participation of dentists to provide care at RACFs. Barriers include lack of training in geriatric dentistry and working conditions
Kossioni <i>et al.</i> (2017) ³³	An investigation into the teaching status of gerodontology in European undergraduate dental schools	Europe (29 countries)	123 deans of dental school (or equivalent contact person)	Quantitative	86.3% of schools teach gerodontology. More training opportunities for frail and dependent older people are needed.
Lee <i>et al.</i> (2001) ¹⁰	A discussion into gerodontology curriculum for preparation of the oral health problems expected by baby boomers			Narrative discussion (student essay)	Dental students graduating currently will need to be better prepared for the effects of a growing population keeping natural dentition for longer
Levy <i>et al.</i> (2013) ²⁰	A review of US geriatric education in dental schools	USA	62 dental schools	Quantitative	There is a lack of curriculum hours dedicated to gerodontology to equip graduates to manage older patients. There are many barriers involved which can be counteracted by an increase in education
MacEntee (2010) ²²	A discussion of the challenges faced by geriatric dental education			Narrative	Gerodontology education is still mostly science-based and needs to incorporate a social accountability and humanistic approach to meet the challenges of managing oral health in older people
Nitschke <i>et al.</i> (2015) ²³	A description of attitudes of dental students towards aged during an undergraduate gerodontology programme	Leipzig, Germany	160 dental students at Leipzig University (50 male 110 female)	Mixed methods	There is an importance in adequate preparation of students when encountering RACFs to avoid loss of hope Changes during the course did not impact on students attitudes
Nitschke <i>et al.</i> (2013) ²¹	A study of whether there is an increase in undergraduate gerodontology teaching in line with an increase of dental need from 2004 to 2009	Austria, Germany, Switzerland	3 Austrian, 4 Swiss and 30 German dental schools	Quantitative	There has been an increase in didactic and practical training in Austria and Germany. Barriers to further development of the subject still exist
Nochajski <i>et al.</i> (2011) ²⁴	A study into the attitudes of dental students towards older adults relative to contact with older adults	Buffalo, USA	311 dental students from University of Buffalo School of Dental Medicine	Qualitative	Clinical exposure may be fundamental to support positive student attitudes towards older adults Assumptions that no significant difference for contact with older adults outside the school context

Table 2 *Continued*

Author, Date	Aim	Location	Participants	Study design	Major findings
Preshaw & Mohammed (2005) ³⁴	Identification of the status of geriatric dentistry education in European dental schools	Europe (27 countries)	82 dental schools	Quantitative	61% of schools had a clinical component of geriatric dentistry. 43% of schools provided training at RACFs/mobile clinics. 7% of schools provided no geriatric training
Shah (2010) ¹¹	A discussion of gerodontology education in global perspective			Narrative	Sensitization of undergraduate students to geriatric dentistry may improve postgraduate enrolment to gerodontology courses
Slack-Smith <i>et al.</i> (2015) ¹⁸	A review of geriatric dentistry teaching and consider the context of it in Australia	Australia		Narrative literature review	There has been inadequate reorganization of dental services to adapt to changing demographic profile for older people. There needs to be a decision whether gerodontology should stand alone as a discipline or be incorporated into special needs dentistry
Waldrop <i>et al.</i> (2006) ¹²	An assessment of dental students' knowledge of ageing, comfort and care strategies	Buffalo, USA	321 dental students from University of Buffalo School of Dental Medicine	Mixed methods	Dental students' knowledge was low, comfort with geriatric issues improved after educational interventions, strategies changed with experience
Wallace <i>et al.</i> (2014) ^{13,15}	A study of the view of final year dental hygiene students about a placement in 17 RACFs	NSW, Australia	35 final year dental hygiene students from the University of Newcastle	Qualitative	Students felt unprepared for RACF placements even with a pre-placement orientation. A pre-placement programme is recommended to enable a better transition from the classroom to the RACF environment
Wallace <i>et al.</i> (2014) ^{13,15}	An assessment of whether dental hygiene students attending RACFs on clinical placements gained knowledge about oral care of older people and RACFs	NSW, Australia	33 dental hygiene students from the University of Newcastle	Mixed methods	The placement programme enhanced knowledge of dental and medical conditions of older people and the structure and services of RACFs
Wallace <i>et al.</i> (2013) ¹⁴	An study of reflective journals to identify dental hygiene students' experiences and learning during a RACF placement	NSW, Australia	67 final year dental hygiene students from the University of Newcastle	Qualitative	Reflections identified negative experiences early in the placement suggesting a need for more preparation prior to entering an RACF
Wallace <i>et al.</i> (2017) ¹⁶	An assessment of an orientation re-enactment DVD used to facilitate dental hygiene students	NSW, Australia	38 dental hygiene students from the University of Newcastle	Qualitative	The orientation DVD reduced student anxiety and improved confidence prior to entering the RACF for their placement
Wolff <i>et al.</i> (2014) ¹⁹	An assessment of the status of dental curricula on elder care and the effect of the curricula on practitioner behaviours	USA and Canada		Narrative	Clinical education in older person's dental care must involve sufficient experiences to address competence and influence attitudes and willingness to treat older people
Wright (2015) ⁶	A discussion on the social implications and workforce issues in the oral health workforce in an ageing population	Australia		Narrative	Equality in access of oral care for older people will require dynamic models of care. Traditional models of clinical training should be adapted to provide better integration across the aged care sector

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