A global review of the education and career pathways of dental therapists, dental hygienists and oral health therapists

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Key points

Dental therapists, dental hygienists and oral health therapists serve as primary oral healthcare providers and work collaboratively with dentists and other healthcare professionals.

Dental therapists, dental hygienists and oral health therapists have the potential to pursue a career beyond clinical practice in areas such as research, education and government.

Additional research is needed to explore if dental therapists, dental hygienists and oral health therapists have the desire to pursue non-clinical careers and the benefits of non-clinical careers.

Abstract

Introduction With ongoing needs in oral healthcare being unmet, dental therapists, dental hygienists and oral health therapists have the potential to assume greater roles and responsibilities in the provision of care. This review provides a global overview of the education and career opportunities of these professions, contributing to the discussion on the future trajectories of all three professions.

Methods A scoping review was conducted to collate and summarise the current available evidence from peer-reviewed journal articles, published reports and books, and websites of professional associations and government agencies.

Results Of the 145 sources identified and reviewed, 53 were included in the qualitative synthesis. The themes were categorised into domains: 1) dental therapy; 2) dental hygiene; and 3) oral health therapy.

Conclusion The results of this review indicated that, although there has been continuous advocacy for dental therapists, dental hygienists and oral health therapists to assume roles beyond the traditional clinical practice, the majority of the professionals still mainly practise as clinicians. Many dental therapists, dental hygienists and oral health therapists felt limited by their scope of practice and were dissatisfied with the lack of career pathways. Additional research is needed to examine the influences behind career development for all three professions.

Introduction

In Australia and around the world, individuals with low socioeconomic status face greater oral health disparities and burden of diseases, and also lack the appropriate access to care.[1,2,3] Untreated oral diseases are associated with preventable hospitalisations and pose a significant financial burden to the healthcare system.[1,2,3] According to the Australian Institute of Health and Welfare (AIHW), 32% of Australians who are five years or older reported avoiding or delaying dental visits due to cost, while 20% reported that cost prevented them from electing the recommended treatment and 12% reported facing major financial hardships due to dental visits.[1]

The professions of dental therapy (DT), dental hygiene (DH) and oral health therapy (OHT) were established to address issues surrounding the access to care by serving as complementary primary healthcare providers to dentists.[2,3,4,5,6,7] Dental therapists have a special focus on treating children who are at risk for early childhood caries by providing a limited range of restorative care and non-surgical extractions.[2,3,4,5,6,7] Likewise, dental hygienists treat adults who are at risk for periodontal diseases through non-surgical periodontal therapy.[4,5,6,7] In comparison, the dually qualified oral health therapists serve as a prevention-focused oral health generalist that provides both DT and DH care.[4,5,6,7] From 2013 to 2016, the number of registered dental hygienists in Australia increased from 1,621 to 1,740 which showed a 7% increase.[1] Similarly, the Australian OHT profession increased by 52% from 2013 to 2016 as the profession expanded from 943 registrants to 1,434.[1] In Europe, reports from the Council of European Dental Officers showed that the countries with the largest number of registered dental hygienists in 2016 were Finland (2,974), Hungary (3,795) and Spain (3,000).[8] In the United Kingdom (UK), dental hygienists and dental therapists made up 9% of the total dental workforce in 2019.[9] From 2008 to 2019, the number of registered dental therapists almost tripled from 1,164 to 3,373 while the number of registered dental hygienists increased by 42% (5,160 to 7,325).[9]

Today, members of all three professions work collaboratively to improve access to oral healthcare for underserved communities through disease treatment and prevention, oral health promotion and education.[2,3] In addition, dental therapists, dental hygienists

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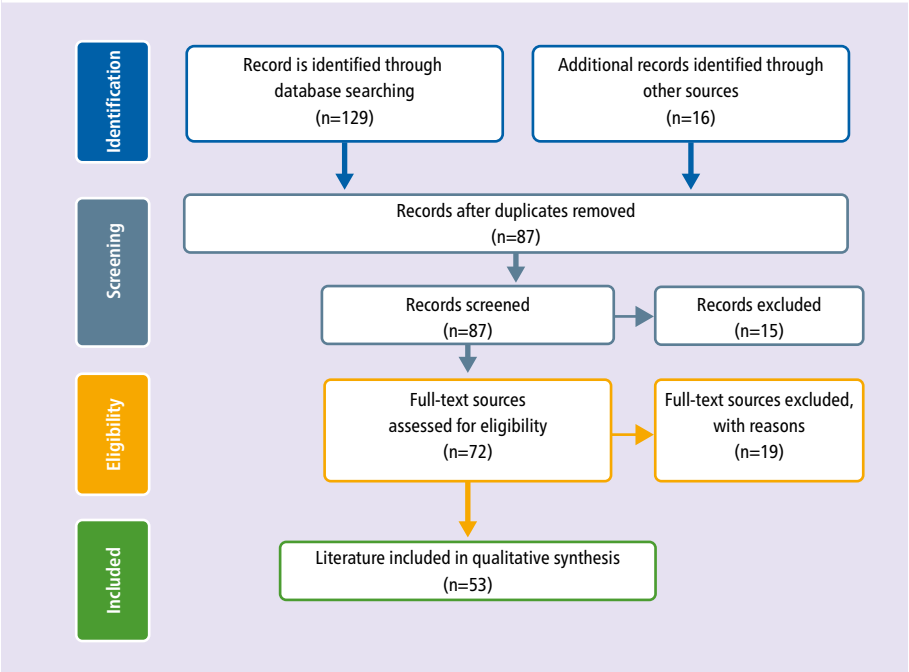
Fig. 1 PRISMA flowchart on source selection



and oral health therapists alleviate dental workforce shortages by working in public and rural settings.[2,3] Due to concerns over patient safety and the political tensions between dentistry and the DT, DH and OHT professions, regulatory requirements stipulated Australian dental therapists, dental hygienists and oral health therapists to only practise within a 'structured professional relationship' with a dentist.[2,3,5] However, this requirement has been rescinded in July 2020, which enabled members of all three professions to practise with greater independence.[4,5]

With changes in education and regulatory requirements, dental therapists, dental hygienists and oral health therapists have the ability to make significant contributions in advancing the oral health of society through research, education, leadership and policy change, in addition to providing clinical therapy.[2,3,4,7,10,11] The broad competency-based education has prepared dental therapists, dental hygienists and oral health therapists to pursue careers beyond clinical practice in areas such as academia, administration, dental industry, consultancy, education and advocacy.[2,10,11,12,13,14,15,16] Moving beyond clinical practice, there will be more opportunities to address the growing complexity of oral healthcare needs through macroscopic aspects such as research and policy change.[12,13,14,15,16] Dental therapists, dental hygienists and oral health therapists who assume more roles than only being a clinician can support the advancement of all three professions by informing legislation and gaining more recognition from the general public, other healthcare professionals, researchers and government officials.[12,13,14,15,16] In addition, employment positions in public health authorities and educational institutions often offer benefits packages and union protection, which may not be available in traditional clinical practice settings.[12,13,14,15,16] Nonetheless, a large proportion of Australian dental therapists, dental hygienists and oral health therapists are still primarily practising in a clinical setting.[17,18,19] Hence, the purpose of this scoping review is to provide an overview of the state of the DT, DH and OHT professions globally, and to examine the career pathways and educational outcomes of these professions.

Methods

This scoping review aimed to explore and summarise the literature related to the education and careers of DT, DH and OHT professions. The framework outlined in the *Joanna Briggs Institute Reviewers' Manual* was adopted.[20] Keywords and their synonyms such as 'oral health therapy', 'dental hygienist', 'dental therapist', 'career pathway', 'career satisfaction', 'practice setting' and 'graduate education' were grouped in searches using "OR" and "AND". The literature search was completed in April 2020 through Semantic Scholar and Google Scholar. Publications in areas such as public health, dental education, DH education and general dentistry were identified. Peer-reviewed journal articles, books, reports, and websites from government agencies and professional associations were included in this review. Years of publication were not limited when gathering the literature. All literature was retrieved from PubMed, Google Scholar and Semantic Scholar. The title and abstract of literature that emerged from searches were inspected for relevance to the purpose of this review by the first author. The first author was also responsible for reading the texts and abstracts to assess for relevance. After reading the text, relevant full-text articles, reports, books and websites in English were included. After reading the abstract, literature that was irrelevant to the purposes of this review, not published in English or unavailable online in full text was excluded. Literature was deemed irrelevant when there was no mention of the educational outcomes or career pathways of DH, DT and OHT.

Results

In total, this review included nine reports published by government agencies and professional organisations, 37 peer-reviewed journal articles, and information extracted from seven government, professional association and university websites. After reading the abstracts, 15 journal articles were excluded as these articles focused on other areas of DH, DT and OHT professions such as curriculum reform, student experience and policy change, instead of educational outcomes and career pathways. An additional four journal articles were excluded as they were either not published in English or unavailable online in full text. The included journal articles were a mix of quantitative and qualitative studies. A thematic approach was utilised to analyse, organise, describe and summarise the literature.[21] This review followed the thematic analysis process suggested by Nowell *et al.* which includes: 1) being familiarised with the literature via multiple reads; 2) searching and identifying concepts and themes; and 3) describing and summarising the themes.[20] Information from all sources was categorised into three broad domains: 1) DT; 2) DH; and 3) OHT. Within each domain, themes in education and career were collated, along with themes that were specific to the corresponding profession. See Figure 1 for a PRISMA flowchart on source selection.

Dental therapy

Scope of practice and education

The primary mandate of DT is to reduce the caries prevalence among children and adolescents through treatment, prevention and education.[2,3,22,23,24,25] In most countries, dental therapists may only practise either under the supervision of a dentist or in consultation with a dentist.[22,23,24] However, in the UK, regulatory changes in 2013 allowed dental therapists and dental hygienists to treat patients directly without the prescription of a dentist.[26] Similarly, in Australia, an updated scope of practice was implemented in July 2020 to allow dental therapists, dental hygienists and oral health therapists to practise with greater independence.[5]

DT education in most countries has remained at a vocational level, focusing heavily on clinical therapy.[12,13,14,15,20,22,23,24] Graduates were typically awarded a certificate or diploma in DT.[2,3,21,22,23] In New Zealand, Australia, the UK and Minnesota (US), DT degree programmes are available, leading to DT-only or dental therapy-hygiene qualifications.[22,23] Nonetheless, there is currently a lack of graduate DT education aside from the clinical master programmes offered at Minnesota (US), which grant its graduates qualifications in dental hygiene-therapy.[25] In recognition of the need, the Dental Therapy Association of South Africa has recommended the development of graduate degrees in DT.[23]

Dental therapy as a career

The transition of DT education to a degree level has precipitated changes to the scope of practice, but has yet to result in changes in career pathways beyond clinical practice.[22,23,24,25] This was evident in the 2017 Australian health workforce data which revealed that only 8% of dental therapists self-identified as a non-clinician and over 90% reported dental clinics as their principal work setting.[17] This phenomenon is similar to findings in the US, the UK, New Zealand, Canada, Singapore and Hong Kong where dental therapists practise almost exclusively in a clinical setting.[22,23,24,25,27,28,29,30]

For dental therapists who were satisfied with their career, the most cited reasons were good remuneration, a strong sense of belonging to the workplace, flexible hours, being able to help others, the variability of work and good relationships with patients.[27,28,29,30] However, some dental therapists felt dissatisfied with their career, citing reasons from conflicts between obligations in family and work, the lack of sense of belonging to the dental community and workplace, low remuneration, the lack of career options and promotion, and the lack of recognition of the profession.[27,28,29,30] Some dental therapists also expressed a desire to expand their scope of practice, practise independently and be capable of pursuing careers at the managerial level as well as in academic institutions.[29,30]

Quality of dental therapy care

In many countries, the lack of independent DT practice stemmed from concerns over the quality and safety of DT care.[22,23,24] However, a literature review in 2012 found that the technical quality of DT care was either to the same standards or superior to that performed by a dentist, and also suggested that there have been no documented issues of safety and harm as a result of DT care in the literature.[22,23] Similarly, a 2010 UK study reported that patients felt more satisfied when being treated by dental therapists compared to dentists, especially in areas such as patient communication and perceived technical competence.[31]

In Australia, Calache *et al.* (2011) and Hopcraft *et al.* (2015) examined the educational outcomes of the dental therapists who completed a pilot continuing education programme for treating patients of 26 years and older.[32,33] The 2011 study found that the participating dental therapists were competent in treating adults over the age of 26, especially in areas such as oral examination, direct restorations, local anaesthesia and oral pathology.[32] In the 2015 follow-up study, dental therapists were deemed fully competent by their mentoring dentists in delivering quality care to adult patients who are 26 and older.[33]

Impact and controversies around dental therapy

The definitive impact of DT care has been scrutinised over the years, primarily by dentists.[2,3,22,23,24,34] Large-scale epidemiological data have demonstrated that dental disease prevalence among children was generally decreasing after the introduction of DT care.[22,23,24] However, this observation has been attributed to water fluoridation, fluoridated toothpaste, improved access to DH care and low-cost treatments offered by dentists.[22,23,24] Advocates of DT argued that the employment of dental therapists is more cost-effective to health authorities than that of the dentists, as the remuneration could be 70–80% less.[22,23,24,34,35] Therefore, the government can employ more dental therapists and more people will have access to care.[34] This viewpoint was countered by the argument that the cost of hiring supervising dentists was often not incorporated into the cost calculations.[22,23,24,35] Furthermore, dentists have argued that dental therapists are less competent, provide lower-quality care and are therefore threats to public safety if allowed to practise independently.[22,23] The systematic review conducted by the American Dental Association in 2013 found that the studies pertaining to the financial and public health impacts of DT care were mostly outdated and potentially biased, and concluded that there was no difference in the increment and severity of dental caries among populations treated by dental therapists and dentists.[24]

Dental hygiene

Scope of practice and education

Akin to their counterparts in the US and Canada, Australian dental hygienists provide non-surgical periodontal therapy and oral health education to patients of all ages, but were required to practise within a 'structured relationship with a dentist' until the implementation of the new scope of practice in July 2020.[2,3,5,7,10,11,36] Moreover, dental hygienists in certain parts of the US and Canada may also administer local anaesthesia independently and prescribe medications.[10,11]

There has been a strong push for DH education to transition from diploma to baccalaureate over the past 20 years in the US and Canada.[10,11,12,13,14,15] This is similar to Australia where DH education has transformed mostly to baccalaureate.[5,6,7] Diploma DH programmes are typically two years long with a strong emphasis on preparing the graduates for clinical practice.[12,13,14,15,37,38] In comparison, baccalaureate DH programmes have a longer duration and broader focus to enable students to acquire competencies in policy use, advocacy and leadership, in addition to clinical therapy.[37,38] As a result, baccalaureate dental hygienists are more prepared for careers beyond clinical practice in areas such as academia, education and public health.[12,13,14,15] Rowe *et al.* found that baccalaureate dental hygienists are more likely to become educators and researchers and hold leadership positions in various settings.[39,40] Similarly, Kanji *et al.* reported that diploma dental hygienists who pursued DH degree completion have elevated

confidence, expanded theoretical knowledge, and improved critical thinking abilities and quality of care.[13,14] Diploma dental hygienists who pursued degree completion felt that the additional knowledge and credentials have prepared them for practice beyond clinical settings.[13,14] In 2018, another study by Kanji *et al.* found that over 45% of the participating baccalaureate dental hygienists worked in education, administration and public health, and 41% of the diploma dental hygienists changed their practice setting from private clinical to education, public health and hospital after obtaining their DH degree.[15]

Transitioning beyond clinical practice

The American Dental Hygienists' Association has been advocating for dental hygienists' involvement in research by pursuing graduate education and careers in academia, and the continual building of the DH research infrastructure, which serves to promote public wellbeing and inform education, practice and legislation.[10,38,41] Dental hygienists who pursue graduate education generally perceive graduate degrees as a means to obtain diverse employment opportunities and improve their DH knowledge.[41,42,43,44,45] A US study reported that a significant portion of dental hygienists shifted their primary practice setting from clinical practice to education and academia after earning their Masters degree.[45] However, factors such as the lack of financial and practical benefits, the cost, the lack of programme options and family obligations often prevent dental hygienists from seeking graduate education.[40,44,45]

Dental hygiene as a career

Factors such as remuneration, inter-professional collaborations, variations in tasks, autonomy, respect from other professions and opportunities for career advancements were associated with DH career satisfaction.[15,45,46,47,48] Dental hygienists tend to be less satisfied when they experience boredom with the profession, feeling restricted by their scope of practice and trapped in one practice setting.[47] Being in a female-dominant profession, male dental hygienists also reported experiencing gender stereotypes and discrimination on occasions, such as patients refusing to be treated by men, colleagues making derogatory remarks and mixed feelings of acceptance into the female-dominant professional associations.[49]

In 2017, 97% of the practising Australian dental hygienists reported their principal role as a clinician and 94% indicated their principal work setting as private practice.[18] A study in 2008 found that Victorian dental hygienists were satisfied with their career in clinical practice and felt that the remuneration was sufficient.[50] Another study published in the same year found that the main reasons for Victorian dentists to employ dental hygienists were to allow the dentist to have more time for complex procedures, to reduce the patient waiting times and to make the practice more profitable.[51] Most dental hygienists in this study also expressed desires to shoulder more responsibilities and be able to practise independently.[51] However, fewer employer-dentists supported expanding dental hygienists' scope of practice and most strongly opposed the proposal of independent DH practice.[51]

Oral health therapy

Scope of practice and education

In the UK, New Zealand and Australia, oral health therapists are broadly educated healthcare professionals; they not only have the integrated scope of practice of both DH and DT, but are also educated in other disciplines such as public health, business, social psychology and biomedical ethics.[2,3,22,23] Often, OHT students complete the same or very similar didactic modules in areas such as head and neck anatomy, local anaesthesia, restorative dentistry and biomedical sciences as dental students.[2,3,22,23,52] Contemporary Australian oral health therapists may provide all clinical procedures that are within the scope of practice of DH and DT for patients of all ages.[5] In addition, oral health therapists gained greater autonomy when the regulatory requirement to practise within 'a structured professional relationship with a dentist' was rescinded in July 2020.[4,5,7]

Profile of oral health therapy students

Three large-scale surveys have been conducted over the past 15 years to examine the career aspirations and demographics of OHT students in Australia and New Zealand.[53,54,55] In two studies published separately in 2014 and 2017, 47% (2014) and 31% (2017) of OHT students nominated dentistry as their first career preference in comparison to 39% (2014) and 60% (2017) who nominated OHT.[54,55] The reasons for becoming an oral health therapist include the desire for caring for others, interesting career, employment security, working with others and the potential for self-employment.[53,54,55] Interestingly, some oral health therapist students also indicated that OHT may provide a better opportunity in entering dentistry.[53] With regards to career plans, the majority of OHT students expressed interest in pursuing clinical practice in private and public dental clinics, while some wanted to pursue graduate studies and positions in research as well as education.[53,54,55] In Marino *et al.*'s 2014 study, while 75% of the surveyed OHT students in Australia and New Zealand expressed intentions to remain as an oral health therapist for the long term, 15% of the participants expressed interest in pursuing dentistry after graduation.[54]

Oral health therapy as a career

In the UK, dually qualified dental therapist-hygienists tend to pursue a career in clinical practice, but often felt dissatisfied when being limited by their employer-dentists to solely provide DH care.[56,57,58] Many dental therapist-hygienists indicated that their employer-dentists were unaware of their full scope of practice and were not confident in their clinical skills.[57,58] Similarly, another UK study found that dental therapist-hygienists were less likely to be satisfied in areas such as remuneration, working conditions, variety of work and opportunity to practise their full scope.[59]

Similar to dental therapists and dental hygienists, 97% of the Australian oral health therapists indicated their principal role as a clinician and 67% worked in private practice.[17,18,19] A 2011 study revealed that 55% of New Zealand oral health therapists practise both therapy and hygiene, while the remainder were limited to only practise in one area.[60] Many participants suggested that employment opportunities to utilise their full range of skills were limited and they were concerned about maintaining their full scope of practice.[60] Similar to the UK studies, the New Zealand OHT graduates expressed concerns that dentists are not fully informed of their scope of practice.[60] However, in another national study of Australian dental therapists, dental hygienists and oral health therapists published in 2015, researchers suggested that, when analysed as a cohort, oral health therapists do not have a polarised scope of practice to either DT or DH and they have the opportunity to utilise their full range of skills.[61]

Discussion

Although professional associations in DH, DT and OHT have long been advocating for careers beyond clinical practice, a large proportion of the members of each profession still remain as clinicians.[2,3,12,13,14,15,22,23] This is especially evident in Australia where over 90% of the dental therapists, dental hygienists and oral health therapists identified their main role as a clinician.[17,18,19] While providing clinical therapy is an essential component of all three professions, pursuing careers beyond clinical practice may not only result in more variations of work, better benefit packages and better advancement opportunities, but can also increase the recognition and impact of all three professions.[12,13,14,15,16,38] As a result, additional research is needed to investigate the reasons why dental therapists, dental hygienists and oral health therapists do not pursue career pathways outside of clinical practice.

Furthermore, a portion of OHT students nominated dentistry as their primary career preference over OHT and regarded OHT as a profession that will facilitate their entry into dentistry.[53,54,55] Similarly, it is also not uncommon for dental hygienists in Canada to pursue dentistry after their DH education.[14] Thus, it would be meaningful to explore the reasons behind these career changes, and to examine if these students and practising professionals would change their opinion throughout the course of their careers. For the long-term benefit of the DH, DT and OHT professions, education programmes may need to consider admitting students not only with high academic achievements and good motivation, but also those with a strong passion for that profession, instead of using it as a stepping stone for the entrance to another profession. To ensure all professions advance and succeed, it is important to dedicate resources and opportunities to students and members to facilitate career retention.

Based on the findings of this review, future research should aim to answer the following questions:

1. Do dental therapists, dental hygienists and oral health therapists have a desire to work in areas other than clinical practice?
2. Do dental therapists, dental hygienists and oral health therapists wish to utilise or further develop certain competencies?
3. What are the motivations driving dental therapists, dental hygienists and oral health therapists who decided to pursue a career in another profession?
4. What are the potential consequences of dental therapists, dental hygienists and oral health therapists exiting their professions?
5. How can educational programmes and professional associations better support dental therapists, dental hygienists and oral health therapists who wish to pursue graduate studies and careers beyond clinical practice?

This scoping review provided a global overview of the status of DT, DH and OHT professions. There was no time limit for the information search and the evidence was summarised from a variety of sources. The records were screened with inclusion criteria and the qualitative analysis was performed following established guidelines. However, this review has a few limitations. Firstly, only studies published in English and available online in full text were included. As a result, relevant studies published in non-English languages or inaccessible online were omitted. Secondly, the majority of the included studies were published in developed English-speaking countries such as the UK, the US, Canada, Australia and New Zealand, and presented findings primarily from these countries. There is limited research from countries and places such as Hong Kong, Singapore, Sri Lanka and South Africa where dental therapists, dental hygienists and oral health therapists are active and practising. Furthermore, this review included a significant amount of grey literature which may be prone to bias due to the underlying social and political agendas of its authors, funders and publishers.

Conclusion

The DT, DH and OHT education pathways are designed to provide each graduating cohort the competence to practise in various career settings. However, depending on individual aspirations, the scope of practice and career opportunities may be limited to those who wish to gain more independence, provide more treatments for their patients and advance their careers. Research has also shown that it is not uncommon for students to view these professions as a stepping stone for entrance to another profession. Moving forwards, although dental therapists, dental hygienists and oral health therapists are important and respected professionals who play a valuable role in oral healthcare, there is still a scarcity of published research in the dental literature regarding their individual career aspirations and outcomes. Thus, it is imperative to further explore and investigate the motivations, limitations and challenges that these professions face when pursuing career satisfaction.

Conflict of interest

The authors declare they have no relevant conflicts of interest in relation to this work.

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