Received: 11 October 2021 | Revised: 3 January 2022 | Accepted: 5 January 2022

DOI: 10.1002/hpja.576

Health Promotion Journal of Australia | Australian Health Promotion Association | WILEY

RESEARCH ARTICLE

Curriculum mapping of health promotion competencies in dental and oral health training programmes in Australia

Stacey Bracksley-O'Grady[1] | Karen Anderson[2] | Virginia Dickson-Swift[1] | Mohd Masood[3,4]

[1]Violet Vines Centre for Rural Health Research, La Trobe Rural Health School, Bendigo, Victoria, Australia

[2]Rural Department of Community Health, Violet Vines Centre for Rural Health Research, La Trobe Rural Health School, Bendigo, Victoria, Australia

[3]Department of Dentistry and Oral Health, Violet Vines Centre for Rural Health Research, La Trobe Rural Health School, Bendigo, Victoria, Australia

[4]Dental Institute, University of Turku, Turku, Finland

Correspondence
Stacey Bracksley-O'Grady, Violet Vines Centre for Rural Health Research, La Trobe Rural Health School, P.O. Box 199, Bendigo, Vic 3552, Australia.
Email: stacey.bracksleyogrady@latrobe.edu.au

Handling editor: Krysten Blackford

Abstract

Issue addressed: Dental diseases are chronic conditions that place a significant burden on the population's health; however, they are mostly preventable using a range of health promotion strategies Health promotion is a core competency for all dental and oral health graduates, but little is known about what health promotion content is taught in undergraduate degrees. The aim of this study was to explore the dental and oral health content in Australian undergraduate dental and oral health degrees and map against the last two versions of the Australian Dental Council (ADC) health promotion competencies.

Methods: All ADC-accredited dental and oral health courses delivered at Australian universities in 2019 were eligible to be included. Key words were used to locate subjects within the courses that contained health promotion content. This was analysed and ranked against the last two versions (2011 and 2016) of the ADC health promotion competencies. The competencies were then ranked using Blooms updated "six levels of thinking."

Results: Seven oral health and eight dental courses were mapped. The number of health promotion subjects in courses varied substantially; the percentage of subjects that contained health promotion in oral health courses ranged from 30% to 75% and 16% to 60% for dental courses. All oral health courses were explicitly meeting the current ADC health promotion competencies, however, only half of the dental courses met the competency standards.

Conclusion: Curriculum mapping provided a snapshot of the health promotion content within dental and oral health degrees in Australia. Evaluations of the extent to which these courses meet the ADC competencies provide useful information for students, clinicians and policy makers.

So What?: This study provides evidence that health promotion training is occurring at varying levels. However, in dentistry, not all the ADC health promotion competencies are being met. A change is needed in the ADC health promotion competencies and ethos of academics involved in the development of curriculum to include and

give appropriate attention to health promotion theory, especially advocacy. This will enable future dental professionals to advocate for a range of oral health promotion activities such as water fluoridation, universal dental care and sugar-sweetened beverage taxes.

KEYWORDS
competencies, curriculum, dental public health, health promotion, oral health, university

1 | INTRODUCTION

Dental diseases, dental caries (decay) and gum disease are considered non-communicable diseases (NCD) and are a global public health issue.[1] They can cause pain, discomfort and affect a person's speech, eating, sleep, self-confidence and general well-being.[2] Globally, dental diseases affect around 3.5 billion people.[2] In Australia, dental caries is the most common chronic condition for children,[3] and 89% of adults have had dental caries in their permanent teeth.[4] An estimated $9.9 billion was spent on oral health in Australia, 2015-2016, mainly on treating preventable oral diseases.[5] Dental professionals are responsible for diagnosing, assessing, treating and preventing oral diseases. There are several occupational streams in dentistry, including dentists who can practice all aspects of dentistry across the lifespan. Dental hygienists, dental therapists and oral health therapists perform limited clinical treatment and have a strong focus on prevention and health promotion. Dental hygienists and oral health therapists tend to work with patients of all ages with dental therapists focusing more on working with adolescents and children.[6]

1.1 | Health promotion approach to address dental disease

Health promotion can be regarded as "a combination of educational, organisational, economic and political actions designed with consumer participation, to enable individuals, groups and whole communities to increase control over and to improve their health through attitudinal, behavioural, social and environmental changes" pg. 84.[7] Social determinants of health impact a person's oral health,[8] yet the current biomedical approach dominant in dentistry focuses more on addressing and treating the symptoms of dental disease rather than addressing the social determinants of health.[9] Public health approaches that provide population-focused health promotion and education have been highly successful at targeting social determinants of health, reducing disease rates and improving the oral health of the population.[10,11] Some examples of these approaches include the daily use of fluoride toothpaste, reduction of exposure to sugary foods, and the use of systemic and topical fluorides.[10,11] There is a growing consensus that addressing the social determinants and common risk factors that impact overall health is key to improving oral and general health.[2,12,13] Despite growing evidence that supports health promotion as a key component of reducing dental disease and improving oral health, it remains a low priority for dentists.[14] There is a range of reasons for this; health promotion is undervalued in dentistry[15] which impacts the ability of the profession to successfully undertake it and there is confusion around the difference between health education and health promotion.[16,17] Additionally, the lack of appropriate training and skill development in dental and oral health courses has impacted implementation into clinical practice.[18]

1.2 | Health promotion in dental training

There is a limited understanding of the extent to which dental and oral health professionals are adequately equipped with knowledge in health promotion.[18] Without adequate knowledge, the dental and oral health professional is less likely to undertake and implement health promotion strategies as part of their practice.[19] Most dental and oral health training is based around a reactive, biomedical approach rather than a proactive and preventative approach.[13,15] However, dental training can influence the practice and attitudes of graduating dental professionals, with studies finding the low priority given to health promotion measures in dental training is a perceived barrier to implementing prevention in practice.[19,20] Additionally, dental and oral health training has been highlighted as the most important factor affecting dental professionals' attitudes towards preventative measures,[21] and attitudes towards prevention influence practice.[20]

Health promotion is a stated competency for all dental and oral health professionals and health promotion content needs to be a part of the training of the future workforce in Australia and other countries.[22–24] Competencies are statements that outline the threshold of skills and knowledge a student must possess to graduate from a course, or what is required to successfully complete certain tasks. A recent study has explored competencies required to successfully undertake a community oral health promotion project.[25] In this study, they compared their findings to the International Union for Health Promotion and Education (IUHPE) health promotion competencies, which are used mainly to provide a framework for graduating health promotion practitioners, but are useful for other health professionals whose role includes health promotion.[26] In Australia, health promotion competencies for dental and oral health graduates are dictated by the Australian Dental Council (ADC). These competency statements outline graduates must have an understanding of determinants of health, risk factors, theories and principles of health promotion, health promotion strategies and the design and implementation of

evidence-based health promotion.[22] Over the past 10 years, there have been some changes to the statements with new competencies introduced in 2016. For the purposes of this mapping exercise, we chose to include both the new (2016) and old (2011-2016) competency statements in the analysis. The 2011-2016 competency document contains 10 statements regarding health promotion for dentists and 11 for oral health therapists, dental hygienists and dental therapists. The 2016 competency document contains only four health promotion competencies for all dental professionals and there is no differentiation between what was required between the professions. A change in language was also noted in the newer with the competency documents stating that graduates needed to "understand" rather than "understand and apply" health promotion concepts.[27] Although there has been a reduction in the ADC competency statements, it would still be expected that oral health and dental graduates would have some knowledge in health promotion concepts and principles, such as advocate, enable and mediate[28] and understand the impacts of the social determinants of health on health disparities.[29] The extent of this training and assessment of whether dental professionals are developing health promotion skills has not been well documented.[18]

As little is known about the health promotion content in dental and oral health courses in Australia. The aim of this study was to map Australian universities dental and oral health curriculum to explore when and how the health promotion content is being delivered, how this content aligns with the current and older ADC health promotion competencies and assess the level of learning this is occurring at.

2 | METHODS

To address the key aims of this study we chose to use a curriculum mapping approach. Curriculum mapping is concerned with the what (content), the how (learning resources), the when (curriculum sequence) is taught. Curriculum mapping enables transparency and makes it clear what is expected of students during the course and the areas that need to be mastered.[30] Curriculum maps have been used for single subjects,[30] programs[31] or across an entire university.[32] The depth of a map ranges from a list of courses offered in a degree program to an examination of single subjects with comprehensive information such as objectives, timetables, assessment, location[33] and is determined by the needs of the user group and the questions they need to be answered by the curriculum map.[30] Although a useful method for exploring the content of the curriculum, limited research has been undertaken using curriculum mapping in dentistry.[31,34] In a recent study, Maart and colleagues[31] used curriculum mapping to demonstrate curriculum alignment to competencies for a single degree, however, no studies to date have mapped multiple courses from different universities.

For this research, the curriculum content of the dental and oral health courses in Australia was mapped against the ADC health promotion competencies, to provide insight into the health promotion content (the what) and sequence of this content (the when) in the courses. In addition to exploring the what and when of health promotion content in Australian dental and oral health degrees, our mapping included collecting information related to levels of learning within the degrees. To support the analysis of the levels of learning, Blooms Taxonomy[35] was utilised. Blooms "six levels of thinking" is a hierarchical taxonomy that outlines the cognitive process of learning beginning with "remembering" and increasing in complexity through to analysing and then creating using knowledge.[35]

2.1 | Inclusion/exclusion criteria

All ADC-accredited dental and oral health courses delivered at universities in Australia were included in the curriculum mapping. In Australia, in 2019, when the mapping was undertaken, there were 10 ADC accredited oral health courses and nine dental courses, one oral health course was not eligible as it is delivered at a Technical and Further Education (TAFE) institution. TAFE courses have been excluded as the structure differs significantly from bachelor's level courses. Generally, TAFE courses provide vocational and practical approaches to education, whereas Bachelor level qualifications (like Dentistry and Oral Health) take a more theoretical approach to education.[36] Another notable difference is TAFE assess against competency statements, whereas universities assess against intended learning outcomes. These differences mean how the content is delivered and assessed varies significantly. Therefore, the layout of a TAFE course could not be transferred accurately into the curriculum map without the meaning being lost. As a result of this, nine oral health courses were eligible to be included in the mapping.

Courses were excluded from the study if the subject title, subject description or subject intended learning outcomes (SILOs) could not be gathered for the curriculum map.

2.2 | Data collection

Information about the overall course (subject description, course coordinator, length of the course and student intake) was gathered along with subject information; subject title, subject code, year level, semester taught, credit points, subject coordinator and their qualifications; discipline responsible for the subject, mode of delivery, contact hours, subject description, subject intended learning outcomes (SILOs), assessment tasks, teaching activities and lecture program. The course information was gathered from publicly available university websites and subject handbooks for 2019 and collated using Excel. If the required information for each subject was not available publicly, an email was sent to the course coordinator outlining the research and requesting the missing information. Emails were sent to one dental course and two oral health courses, requesting additional information. Ethical approval to send emails for missing information was gained from La Trobe research ethics committee (ethics number HEC19516).

2.3 | Data analysis

We undertook the analysis of the curriculum for each oral health and dental course in four key stages.

1. Content analysis
2. Ranking of HP content in each subject
3. Mapping and ranking HP subjects against ADC competencies
4. Ranking level of learning for competencies using Blooms taxonomy

2.3.1 | Content analysis

To determine which subjects contained health promotion content a list of key words was used to identify the relevant subjects (see Table 1). Key words were developed from the WHO Health promotion glossary,[37] International Union for Health Promotion and Education (IUHPE) competency statements[26] and the current and older health promotion competency statements set out by the ADC[22,23,38,39] (italicised words are from the ADC competency). A tally for the number of times a key word appeared in the subject was kept.

2.3.2 | Ranking of HP content in each subject

The next stage was to rank the amount of health promotion content in each subject of the courses. For any subject ranked two and above these were considered to contain sufficient health promotion content and were included in the rest of the data analysis. The ranking system outlined below was applied.

0 = Not included

1 = Mentioned (1 key word appear in one of the sections subject title, subject description, lecture program)

2 = Partially included (2 or more from the list above) key words appear in one of the sections subject title, subject description, lecture program. Exception 1 key word appears in the Subject Indented Learning Outcomes (SILOs)

3 = Addressed (multiple (3 or more from the list above) key words appear in at least two of the following areas—subject description, assessments, SILOs and lecture content)

4 = Embedded (multiple (3 or more from the list above) key words appear in the subject description, SILO's and lecture content)

2.3.3 | Mapping and ranking HP subjects against ADC competencies

The next stage of analysis was to analyse which ADC health promotion competencies were potentially being addressed within each subject that received a ranking of two or above on the previous ranking (ranking above). This was completed by matching the key words which appeared in SILOs, subject description, assessments and lecture topics with key words linked with each competency (Table 1). This process was undertaken for both the current (2016-current) and the older (2011-2016) ADC health promotion competencies.

Once the competencies were mapped against the subjects, a ranking system was used to understand the extent the competencies were being addressed. The following 3-level ranking system was utilised (see Table 2); 3 for the competency not being addressed, 2 for the competency inclusion implied and 1 for competency inclusion being explicit. Two researchers (SBO and KA) ranked the content separately and then met to discuss differences in ranking, after a discussion if an agreement could not be made a third researcher (MM) ranked the subject.

2.3.4 | Ranking level of learning for competencies

All the subjects in a course that ranked 1 in the above 3-level ranking system (Table 2) were then analysed to determine the level of learning occurring in the subject. To rank the level of learning, Blooms updated "six levels of thinking" concepts were used as a framework.[35] Blooms taxonomy can also be viewed as consisting of three meta-levels.[40] The levels are expert level (design and creation), intermediate level (uses or competent application) and beginner level (basic understanding).[40] Both the six levels of thinking and the 3 meta-levels were used to rank the level of learning (Table 3). Each subject that had explicitly addressed a competency was ranked from 1 (beginner level) to 6 (expert level). For consistency, the verbs used in the SILOs of the subject were used to determine the ranking of the level of learning that was occurring.

Lastly, each course was labelled according to the delivery of the health promotion content. "OH taught"—all health promotion content is delivered by oral health or dental staff, "PH taught"—all health promotion content is delivered externally by staff with public health qualifications, "Blended"—health promotion content is delivered by both oral health/dental staff and staff with public health qualifications, "Integrated"—health promotion content is integrated into clinical practice subjects and taught with other topics (is not a standalone subject) (Table 4).

3 | RESULTS

In 2019, there were nine ADC accredited oral health courses and nine dental courses operating in Australia. However, only seven oral health courses and eight dental courses were included in this study. One oral health course was excluded as it was delivered by a TAFE and one university that delivers oral health and the dental course was excluded as the SILOs were unable to be collected for the subjects in the courses. Overall oral health courses were more likely to contain subjects with more of the key words used to find the health promotion content than the dental courses (see Supplementary Data for a breakdown).

TABLE 1 Key words linked to Australian Dental Council competency statements

ADC competency statement	Key words
Current (N) health promotion competencies for a dentist, oral health therapists, dental therapists and dental hygienists (2016-current)	
(N1) Understand the determinants of health, risk factors and behaviours that influence health	Risk factors, determinants of health (social, environmental, behavioural political, economic), population health, Health behaviour, behaviours that influence health, health risk factors, disease risk factors
(N2) Understand the theories and principles of health promotion	Health promotion, Theories and principles of health promotion, advocacy, community action, Empowerment for health, equity, Healthy public policy, Re-orienting health services, Settings for health, Supportive environments for health, Developing personal skills, Health Promotion Frameworks
(N3) Understand health promotion strategies to promote oral and general health	Health promotion, Health education, Evidence-based education, Prevent* NOT preventative treatment, Evidence for inducing behavioural changes, Behaviour change, Oral health promotion, Disease prevention, Community health, Empowerment for health, Healthy public policy, Re-orienting health services, Settings for health, Supportive environments for health, Developing personal skills, Community development, social marketing, health information, capacity building
(N4) Understand the design, implementation and evaluation of evidence-based health promotion	Health promotion, Health education, Evidence-based education, Oral health promotion, Evaluation of evidence-based health promotion, Evaluation, Re-orienting health services, Settings for health, Supportive environments for health, Developing personal skills, impact/process/outcome evaluation, program design and planning
Older (O-DO) health promotion competencies for Dentists (2011-2016)	
(O-DO1) Serve the community in private or public practice settings, promote health and prevent disease through activities such as: educating individuals and groups; interacting with others to promote activities that protect, restore and improve oral health and the quality of life; organised community efforts	Public health, Health promotion, health education, evidence-based education, Prevent* NOT preventative treatment, Evidence for inducing behavioural changes, Behaviour change, disease prevention, community health, community action, empowerment for health, Re-orienting health services, developing personal skills
(O-DO2) Appreciate the determinants of health and health behaviours	Determinants of health (social, environmental, behavioural, political, economic), health risk factors, health behaviour, behaviours that influence health, disease risk factors, risk factors
(O-DO3) Promote and improve the oral health of individuals and the community by understanding and applying the principles of health promotion and disease prevention	Health promotion, Theories and principles of health promotion, health promotion frameworks, health education, evidence-based education, oral health promotion, advocacy, community action, community development, community development, empowerment for health, equity, equality, re-orienting health services, settings for health, supportive environments for health, developing personal skills, capacity building, social marketing, health policy, disease prevention
(O-DO4) Recognise and appreciate the need to contribute to the improvement of oral health beyond those served in traditional practice settings	Prevent* NOT preventative treatment, Re-orienting health services, Settings for health, supportive environments for health, capacity building, community development, advocacy
(O-DO5) Apply thorough knowledge of the complex interactions between oral health, nutrition, general health, drugs and systemic diseases that can have an impact on oral health care and oral diseases	Risk factors, health risk factors, disease risk factors
(O-DO6) Maintain their own health and understand its importance in relation to occupational hazards and its impact on the ability to practise as a dentist	Maintain own health, occupational hazards
(O-DO7) Promote health maintenance of colleagues	Community health, advocacy, health communication
(O-DO8) Encourage and support patients to take interest in, and responsibility for, the management of their health	Risk factors, Prevent* NOT preventative treatment, disease prevention, empowerment for health, health communication, re-orienting health services, Developing personal skills
(O-DO9) Educate patients at all stages in their life, or patients' family, carers or guardians, about the aetiology and prevention of oral disease using effective and evidence-based education and communication strategies	Health education, Evidence-based education, Prevent* NOT preventative treatment, Evidence for inducing behavioural changes, Behaviour change, health communication, developing personal skills, health information

TABLE 1 (Continued)

ADC competency statement	Key words
(O-DO10) Understand and apply the principles of prevention for inducing behavioural changes which benefit oral health and/or general health	Health education, Evidence-based education, Prevent* NOT preventative treatment, disease prevention, Evidence for inducing behavioural changes, Behaviour change
Older (O-DT) health promotion competencies for oral health therapists, dental therapists and dental hygienists (2011-2016)	
(O-DT1) Promote health and prevent disease through: implementing effective consultation and education strategies with individuals, groups and communities; developing and contributing to strategies to promote, protect, restore and improve oral health and the quality of life; supporting and participating in organised community efforts to promote oral health	Public health, health promotion, theories and principles of health promotion, health education, health promotion frameworks, evidence-based education, prevent* NOT preventative treatment, evidence for inducing behavioural changes, behaviour change, oral health promotion, disease prevention, community development, social marketing, community action, advocacy, empowerment for health, capacity building, health policy, healthy public policy, re-orienting health services, settings for health, supportive environments for health, developing personal skills
(O-DT2) Understand and apply the theories and evidence for inducing behavioural changes which benefit oral health and/or general health	Health education, evidence-based education, evidence for inducing behavioural changes, behaviour change, social marketing, health information, developing personal skills
(O-DT3) Educate patients at all stages in their life, or patients' family, carers or guardians, about the aetiology and prevention of oral disease using effective and evidence-based education and communication strategies	Health education, Evidence-based education, Prevent* NOT preventative treatment, Evidence for inducing behavioural changes, Behaviour change, health communication, developing personal skills, health information, social marketing
(O-DT4) Advocate appropriately for oral and general health in public policy	Advocacy, community action, health policy, healthy public policy
(O-DT5) Promote and improve the oral health of individuals and the community by understanding and applying the principles of primary health care, health promotion and disease prevention	Public health, health promotion, theories and principles of health promotion, health education, health promotion frameworks, evidence-based education, prevent* NOT preventative treatment, disease prevention, oral health promotion, community development, social marketing, community action, advocacy, empowerment for health, equity, equality, capacity building, health policy, healthy public policy, re-orienting health services, settings for health, supportive environments for health, developing personal skills
(ODT-6) Select and implement appropriate health promotion strategies and interventions for individuals and communities	Health promotion, theories and principles of health promotion, health education, health promotion frameworks, evidence-based education, oral health promotion, community development, social marketing, community action, advocacy, capacity building, health policy, healthy public policy, re-orienting health services, settings for health, supportive environments for health, developing personal skills, program design and planning
(O-DT7) Contribute to the improvement of the oral health of people beyond those served in traditional practice settings to advance the oral health of the community	Public health, health promotion, health education, health promotion frameworks, evidence-based education, population health, oral health promotion, community development, social marketing, advocacy, community action, capacity building, health policy, healthy public policy, settings for health, supportive environments for health, program design and planning
(O-DT8) Identify the impact of environmental and lifestyle factors and the determinants of health on oral health and implement strategies to positively influence these interactions	Risk factors, health promotion, determinants of health (social, environmental, behavioural, political, economic), health promotion frameworks, population health, oral health promotion, health risk factors, behaviours that influence health, disease risk factors, community health, community development, advocacy, community action, empowerment for health, capacity building, health policy, healthy public policy, settings for health, supportive environments for health, program design and planning
(O-DT9) Apply knowledge of common health risk factors to integrate oral health and general health promotion	Risk factors, health promotion, determinants of health (social, environmental, behavioural, political, economic), oral health promotion, health risk factors, behaviours that influence health, disease risk factors
(O-DT10) Maintain their own health and understand its importance in relation to occupational hazards and its impact on the ability to practise as a dental therapist	Maintain own health, Occupational hazards
(O-DT11) Promote health maintenance of colleagues	Community health, advocacy

TABLE 2 Competency ranking criteria

1. Competency inclusion explicit	2. Competency inclusion implied	3. Competency not addressed
There is clear evidence of the competency being included in ILO's, learning activities, subject matter and learning outcomes. There is a strong emphasis or focus on the competency in question throughout the subject content.	There are minor or secondary references to the competency in the subject material/learning outcomes. Knowledge and skills obtained in earlier subjects are applied and practised to develop skill further however, the competency is not taught in the subject. May have some exposure to this competency on clinical placement. This competency may come up as a part of a case study.	This principle is not addressed in any part of this subject.

TABLE 3 Level of learning

Level of learning	Bloom's updated "six levels of thinking"	Verbs in ILO's
Higher level (expert)	6. Creating	Design, modify, develop, invent, create, plan, construct, produce, prepare, implement
	5. Evaluating	Evaluate, reframe, criticise, convince, recommend, assess
	4. Analyzing	Analyse, compare, contrast, differentiate, appraise, discriminate
Intermediate level	3. Applying	Apply, solve, modify, use, change, prepare, produce, modify, relate, construct, determine, undertake, promote, engage, educate, contribute, advocate
Lower level (beginner)	2. Understanding	Understand, explain, describe, discuss, demonstrate, interpret, paraphrase, associate, comprehend, appreciate
	1. Remembering	Define, Identify, name, outline, describe, label, list, state, name, recall

3.1 | Health promotion content

All course structures varied in the number of subjects offered during the course. Therefore, the number of subjects that contained health promotion content differed significantly between courses. For oral health courses, the percentage of subjects that contained health promotion in the course ranged from 30% to 75% and for dental courses it was 16% to 60%. See Table 4 for a detailed breakdown of each course and what years that health promotion subjects are delivered.

3.2 | Health promotion delivery

All the included oral health and dental courses contained integrated subjects, where health promotion content was delivered in clinical subjects (subjects which contain a curriculum around preclinical and clinical skills). Three courses (two dental and one oral health course) had all the health promotion content in the course incorporated into the clinical subjects. The remaining courses had a mix of integrated and stand-alone public health/health promotion subjects. If courses had stand-alone health promotion subjects—the dental courses were more likely to be delivered by oral health staff, whereas oral health courses were a mix of oral health and public health staff delivering the content (Table 4).

3.3 | ADC competencies

For the new ADC health promotion competencies (which are the same as both oral health and dental courses) oral health courses were more likely to be addressing all the competencies explicitly. All the oral health courses contained at least one public health subject that clearly addressed the four ADC competencies in the curriculum documents. However, for the dental courses' half of the courses (four courses) were not meeting one or more of the new ADC health promotion competencies in their course (Table 5).

The older ADC competency statements, which were more comprehensive, required students to have a deeper understanding of health promotion and be able to apply this knowledge and were much more closely aligned with the IUHPE health promotion competencies compared to the new ADC competencies.[26] Both the oral health and dental courses were unlikely to meet all these older ADC competencies in their course. However, the oral health courses were more likely to address the older competency statements than the dental courses (the older competency statements are different for dental and oral health courses). Out of the 11 competency statements for oral health courses 2 competencies were not addressed explicitly by most of the courses, 1 of these was around advocacy (only 2 courses were meeting this competency) and the other was *around promoting colleagues' health maintenance* (no courses were addressing this competency). For the dental courses, out of the ten competency statements four were not addressed by many of the courses. The competencies around *addressing oral health outside traditional settings*, *applying knowledge about the complex relationships between oral health and general health and promoting* and *encouraging patients to take responsibility and manage their own oral health* were explicitly addressed by only three courses. Like the oral health courses, no dental course was addressing the competency around *promoting colleagues' health maintenance* (Table 5).

TABLE 4 Number of health promotion subjects in oral health and dental courses

University- course	Total number of subjects	HP subjects	Number of subjects in 1st year	Number of subjects in in 2nd year	Number of subjects in in 3rd year	Number of subjects in in 4th year	Number of subjects in 5th year	How health promotion is delivered[a]
Oral health courses								
Oral health course 1	14	6	2	2	2	N/A	N/A	A mix of Blended and integrated
Oral health course 2	22	8	4	2	2	N/A	N/A	A mix of Blended and integrated
Oral health course 3	23	7	4	2	1	N/A	N/A	A mix of Blended and integrated
Oral health course 4	12	9	5	2	2	N/A	N/A	A mix of integrated and OH taught
Oral health course 5	20	11	2	5	4	N/A	N/A	Integrated
Oral health course 6	20	13	3	6	4	N/A	N/A	A mix of Blended and integrated
Oral health course 7	14	7	2	2	3	N/A	N/A	A mix of Blended and integrated
Dentistry courses								
Dental course 1	20	7	3	3	0	1	0	A mix of Blended and integrated
Dental course 2	25	4	2	0	1	0	1	A mix of Blended and integrated
Dental course 3	27	7	3	2	1	1	N/A	Integrated
Dental course 4	38	16	2	4	4	4	2	A mix of OH taught and integrated
Dental course 5	26	8	2	2	2	2	N/A	A mix of OH taught and integrated
Dental course 6	16	9	4	2	3	0	0	A mix of blended and integrated
Dental course 7	27	15	1	2	5	4	3	A mix of OH taught and integrated
Dental course 8	10	6	2	2	2	0	0	Integrated

[a]Integrated: HP content is embedded in clinical subjects, Blended: HP content taught by both oral health and dental staff and staff with public health qualifications. OH taught: HP content taught by dental and oral health staff, PH taught: HP content taught by staff with public health qualifications.

TABLE 5 Dental and oral health courses explicitly meeting Australia Dental Council competencies

Competency statements	Number of courses explicitly meeting competency	
	Dental courses (out of 8)	Oral health courses (out of 7)
(N1) Understand the determinants of health, risk factors and behaviours that influence health	6	7
(N2) Understand the theories and principles of health promotion	4	7
(N3) Understand health promotion strategies to promote oral and general health	5	7
(N4) Understand the design, implementation and evaluation of evidence-based health promotion	5	7
(O-DO1) Serve the community in private or public practice settings, promote health and prevent disease through activities such as: educating individuals and groups; interacting with others to promote activities that protect, restore and improve oral health and the quality of life; organised community efforts	5	N/A
(O-DO2) Appreciate the determinants of health and health behaviours	6	N/A
(O-DO3) Promote and improve the oral health of individuals and the community by understanding and applying the principles of health promotion and disease prevention	6	N/A
(O-DO4) Recognise and appreciate the need to contribute to the improvement of oral health beyond those served in traditional practice settings	3	N/A
(O-DO5) Apply thorough knowledge of the complex interactions between oral health, nutrition, general health, drugs and systemic diseases that can have an impact on oral health care and oral diseases	3	N/A
(O-DO6) Maintain their own health and understand its importance in relation to occupational hazards and its impact on the ability to practise as a dentist	5	N/A
(O-DO7) Promote health maintenance of colleagues	0	N/A
(O-DO8) Encourage and support patients to take interest in, and responsibility for, the management of their health	3	N/A
(O-DO9) Educate patients at all stages in their life, or patients' family, carers or guardians, about the aetiology and prevention of oral disease using effective and evidence-based education and communication strategies	4	N/A
(O-DO10) Understand and apply the principles of prevention for inducing behavioural changes which benefit oral health and/or general health	5	N/A
(O-DT1) Promote health and prevent disease through: implementing effective consultation and education strategies with individuals, groups and communities; developing and contributing to strategies to promote, protect, restore and improve oral health and the quality of life; supporting and participating in organised community efforts to promote oral health	N/A	7
(O-DT2) Understand and apply the theories and evidence for inducing behavioural changes which benefit oral health and/or general health	N/A	7
(O-DT3) Educate patients at all stages in their life, or patients' family, carers or guardians, about the aetiology and prevention of oral disease using effective and evidence-based education and communication strategies	N/A	7
(O-DT4) Advocate appropriately for oral and general health in public policy	N/A	2
(O-DT5) Promote and improve the oral health of individuals and the community by understanding and applying the principles of primary health care, health promotion and disease prevention	N/A	7
(ODT-6) Select and implement appropriate health promotion strategies and interventions for individuals and communities	N/A	7
(O-DT7) Contribute to the improvement of the oral health of people beyond those served in traditional practice settings to advance the oral health of the community	N/A	5
(O-DT8) Identify the impact of environmental and lifestyle factors and the determinants of health on oral health and implement strategies to positively influence these interactions	N/A	6
(O-DT9) Apply knowledge of common health risk factors to integrate oral health and general health promotion	N/A	6
O-DT10) Maintain their own health and understand its importance in relation to occupational hazards and its impact on the ability to practise as a dental therapist	N/A	6
(O-DT11) Promote health maintenance of colleagues	N/A	0

Note: N#—refers to the current ADC competency statements which are applicable to dental students, oral health therapists, dental hygienist's students.

O-DO#—refers to the older ADC competency statements for dental students.

O-DT#—refers to the older ADC competency statements for oral health therapists, dental hygienist's students.

3.4 | Level of learning—Bloom's "six levels of thinking"

For the new ADC competency statements, the level of learning of all the statements was ranked a 2 for understanding and is the beginner level (Table 3). The oral health courses had either the same level of learning (2) or a higher rank (3 or above) compared to the competency statements. This was similar for the dental courses apart from the competency statement *understanding the theories and principles of health promotion* where one of the courses had a lower level of learning (ranking of 1) (Table 6).

Most of the older ADC competency statements for both dental and oral health courses ranked a 3 for applying and is an intermediate level, apart from a few statements that were ranked 2-1 (understanding) and one statement ranked a 6 (creating). If the competency was being addressed in the oral health and dental courses, then the majority would have the same level of learning or a higher ranking of learning. The exception to this was for two competency statements for oral health courses (O-DT9 and O-DT10) and one statement for the dental courses (O-DO5) where most courses were ranked at a lower level of learning (Table 6).

4 | DISCUSSION

The results of this curriculum mapping exercise revealed that the approach to deliver health promotion content to address competencies within dental and oral health degrees in Australia varies significantly. All the oral health courses were explicitly meeting the new ADC competencies and the depth of learning that was occurring either matched or went above the competencies level. This is not surprising, as the role of dental hygienists, dental therapists and oral health therapists has a stronger emphasis on health promotion.[27] However, half of the dental courses were not explicitly meeting some of the health promotion competencies, for example understanding theories and principles of health promotion. This could be attributed to technical and restorative competencies dominating the dental curriculum.[41] Previous authors have criticised the biomedical model prevailing in dental curricula and as a result, it reduces dentistry to 'drill and fill' and neglects the social determinants of health.[42] In addition, health promotion training is under-recognised and undervalued in dental and oral health education.[15] A study undertaken at the University of Otago with dental and oral health students when they were in their first and third years explored their expectations of future work. Dental students were more focused on restorative/curative treatment, whilst oral health students were more focused on prevention and health promotion.[43,44] Tan and colleagues[43] noted that these expectations reflected the curricula that were delivered to students.

Both oral health and dental courses had some or all the health promotion content embedded into the clinical subjects. Studies have shown that dental and oral health students question the relevance of health promotion in dentistry.[15,42] Therefore, embedding the health promotion content into clinical subjects may be a way to give the content legitimacy and relevance in the students' eyes. It was unclear in the mapping how seamless the inclusion of the health promotion content was within those subjects, if the content is not well integrated it may marginalise the health promotion content and give the message that it is not "really" dentistry. If the courses were to have standalone health promotion subjects the subjects in the dentistry course were more likely to be taught by oral health and dental professional. This is not a surprise as it's been shown that dental students prefer to be taught by dentists even for non-clinical subjects.[42]

Most of the subjects that contained health promotion content addressed the competencies around understanding health promotion theory and implementing health promotion strategies. However, the focus in the subjects was on health education, rather than a broad health promotion approach. These subjects were still ranked 1 in the ranking of how well the competency was being addressed in the subject as health education is a sub-set of health promotion.[45] This is not surprising as there is a heavy reliance on health education within dentistry.[13,16,17] Sometimes health education can be seen as the only approach to preventing disease. A reason for this may be students do not feel adequately trained in all aspects of health promotion, just health education. A study was undertaken in Canada assessing students' confidence in competency domains once graduated found students were 90% confident in oral health education, but only 50% confident in their health promotion skills.[46] This lack of training and confidence would reinforce the belief that health education is the only approach to preventing disease and addressing social determinants.[41] Another factor that may provide insight into the reliance on health education is the structure of funding in dentistry. There is very little remuneration for undertaking health promotion in dentistry with a very small fee attached to chairside oral hygiene instruction (OHI) and oral health education, whereas clinical procedures attract a higher remuneration.[16] This structure of funding means dental professionals have to reconcile spending time delivering health promotion and being profitable.[47] The lack of funding further marginalises health promotion in dentistry and reinforces the narrative that health promotion is not an important or essential element of dentistry.

When exploring the depth of learning that was occurring within the courses using Bloom's "six level of thinking" many of the courses were teaching health promotion content above or at the same level as set out by the ADC competencies. The new ADC competency statements express students need to "understand" the health promotion content, which ranks at a level 2 the lower level of learning and is considered a beginner level. This level relates to students' retention of information and facts, the next level (intermediate level) refers to applying and at this level it would be expected that students would incorporate the knowledge into their existing schemas, whereas in the higher levels students would move to skills such as critical thinking.[35] Therefore, the issue with focusing on the lower levels of learning of knowledge and comprehension, means dental and oral health students may know and

TABLE 6 Level of learning (LL) for Bachelor of Oral Health (BOH) and Dentistry courses

Competency statement (CS)	LL for CS	BOH course didn't meet CS	BOH course LL below	BOH course LL same	BOH course LL above	Dentistry course didn't meet CS	Dentistry course LL below	Dentistry course LL same	Dentistry course LL above
(N1) Understand the determinants of health, risk factors and behaviours that influence health	2	0%	0%	57.1%	42.8%	25%	0%	50%	25%
(N2) Understand the theories and principles of health promotion	2	0%	0%	14.3%	85.7%	50%	12.5%	0%	37.5%
(N3) Understand health promotion strategies to promote oral and general health	2	0%	0%	0%	100%	37.5%	0%	0%	62.5%
(N4) Understand the design, implementation and evaluation of evidence-based health promotion	2	0%	0%	0%	100%	37.5%	0%	0%	62.5%
(O-DT1) Promote health and prevent disease through: implementing effective consultation and education strategies with individuals, groups and communities; developing and contributing to strategies to promote, protect, restore and improve oral health and the quality of life; supporting and participating in organised community efforts to promote oral health	3	0%	0%	42.9%	57.1%	N/A	N/A	N/A	N/A
(O-DT2) Understand and apply the theories and evidence for inducing behavioural changes which benefit oral health and/or general health	3	0%	14.2%	42.9%	42.9%	N/A	N/A	N/A	N/A
(O-DT3) Educate patients at all stages in their life, or patients' family, carers or guardians, about the aetiology and prevention of oral disease using effective and evidence-based education and communication strategies	3	0%	14.2%	42.9%	42.9%	N/A	N/A	N/A	N/A
(O-DT4) Advocate appropriately for oral and general health in public policy	3	71.4%	0%	14.3%	14.3%	N/A	N/A	N/A	N/A
(O-DT5) Promote and improve the oral health of individuals and the community by understanding and applying the principles of primary health care, health promotion and disease prevention	3	0%	14.3%	14.3%	71.4%	N/A	N/A	N/A	N/A
(ODT-6) Select and implement appropriate health promotion strategies and interventions for individuals and communities	6	0%	0%	100%	0%	N/A	N/A	N/A	N/A

TABLE 6 (Continued)

Competency statement (CS)	LL for CS	BOH course didn't meet CS	BOH course LL below	BOH course LL same	BOH course LL above	Dentistry course didn't meet CS	Dentistry course LL below	Dentistry course LL same	Dentistry course LL above
(O-DT7) Contribute to the improvement of the oral health of people beyond those served in traditional practice settings to advance the oral health of the community	3	28.6%	0%	14.3%	57.1%	N/A	N/A	N/A	N/A
(O-DT8) Identify the impact of environmental and lifestyle factors and the determinants of health on oral health and implement strategies to positively influence these interactions	1	14.3%	0%	0%	85.7%	N/A	N/A	N/A	N/A
(O-DT9) Apply knowledge of common health risk factors to integrate oral health and general health promotion	3	14.3%	57.1%	14.3%	14.3%	N/A	N/A	N/A	N/A
(O-DT10) Maintain their own health and understand its importance in relation to occupational hazards and its impact on the ability to practise as a dental therapist	3	14.2%	42.9%	42.9%	0%	N/A	N/A	N/A	N/A
(O-DT11) Promote health maintenance of colleagues	3	100%	0%	0%	0%	N/A	N/A	N/A	N/A
(O-DO1) Serve the community in private or public practice settings, promote health and prevent disease through activities such as: educating individuals and groups; interacting with others to promote activities that protect, restore and improve oral health and the quality of life; organised community efforts	3	N/A	N/A	N/A	N/A	37.5%	0%	12.5%	50%
(O-DO2) Appreciate the determinants of health and health behaviours	2	N/A	N/A	N/A	N/A	25%	0%	50%	25%
(O-DO3) Promote and improve the oral health of individuals and the community by understanding and applying the principles of health promotion and disease prevention	3	N/A	N/A	N/A	N/A	25%	0%	37.5%	37.5%
(O-DO4) Recognise and appreciate the need to contribute to the improvement of oral health beyond those served in traditional practice settings	2	N/A	N/A	N/A	N/A	62.5%	12.5%	0%	25%

(Continues)

TABLE 6 (Continued)

Competency statement (CS)	LL for CS	BOH course didn't meet CS	BOH course LL below	BOH course LL same	BOH course LL above	Dentistry course didn't meet CS	Dentistry course LL below	Dentistry course LL same	Dentistry course LL above
(O-DO5) Apply a thorough knowledge of the complex interactions between oral health, nutrition, general health, drugs and systemic diseases that can have an impact on oral health care and oral diseases	3	N/A	N/A	N/A	N/A	62.5%	37.5%	0%	0%
(O-DO6) Maintain their own health and understand its importance in relation to occupational hazards and its impact on the ability to practise as a dentist	3	N/A	N/A	N/A	N/A	37.5%	12.5%	37.5%	12.5%
(O-DO7) Promote health maintenance of colleagues	3	N/A	N/A	N/A	N/A	100%	0%	0%	0%
(O-DO8) Encourage and support patients to take interest in, and responsibility for, the management of their health	3	N/A	N/A	N/A	N/A	62.5%	0%	0%	37.5%
(O-DO9) Educate patients at all stages in their life, or patients' family, carers or guardians, about the aetiology and prevention of oral disease using effective and evidence-based education and communication strategies	3	N/A	N/A	N/A	N/A	50%	0%	12.5%	37.5%
(O-DO10) Understand and apply the principles of prevention for inducing behavioural changes which benefit oral health and/or general health	3	N/A	N/A	N/A	N/A	37.5%	12.5%	0%	50%

understand health promotion content but not be able to translate this into practice.

Throughout the content analysis, a difference in how the term prevention was used in the clinical vs the public health subjects was noted. In a clinical context, the term prevention was linked to preventative treatments such as topical fluoride application and pit and fissure sealants. Whilst these are aimed at preventing disease these alone will not have a long-lasting impact on improving oral health outcomes.[48] This contrasts with how the term prevention was used in the public health subjects where it was used to refer to health promotion concepts and strategies. This highlights the lack of clarity in relation to the term prevention in dentistry which may cause confusion about exactly what that entails. An example of this lack of understanding is evident in a recent study exploring the perceived competency of preventive dentistry among dental graduates.[20] The survey used in this study included items on oral hygiene instruction (OHI), dietary counselling, preventative treatments such as topical fluoride application, pit and fissure seals, and preventative resin restorations but there was no mention of primary prevention or health promotion.

Advocacy is an important part of health promotion practice and is one of the key strategies required for health promotion practice internationally.[28] With most of the key determinants affecting oral health (and overall health) lying outside of the health system, skills in advocacy are needed to raise awareness of the political, economic, social, cultural, environmental, behavioural and biological factors that can contribute to poor health outcomes. Oral health professionals are well-positioned to undertake advocacy work and have been instrumental in policy changes that affect oral health status across the globe.[49] It is disappointing to see that advocacy has been removed from the current (2016) ADC competency statements for both oral health and dental courses despite calls for dental and oral health professionals to play a role in advocacy.[50] To improve dental disease rates an emphasis on population-wide prevention is needed, dental professionals are well situated to advocate for things such as community water fluoridation and sugary drinks tax.[49] However, studies have shown that dental students do not think they are agents of change[51] or have an obligation to address the oral health concerns of society.[12] If training does not contain advocacy, then it is understandable that this is the view held by graduates. If they are not exposed to the ideas and it is not included in the curriculum or current ADC competencies, then graduates would not see it as part of their responsibilities in practice. It is clear from this curriculum mapping that advocacy does not feature in the health promotion content in most Australian courses; therefore, students are not being provided with opportunities to develop the required skills to undertake advocacy once graduated.

Both dental and oral health courses were more likely to be addressing the newer ADC competency statements (2016) compared with the older statements (2011). This was unsurprising as there are less competency statements in the newer version and the statements focus on students having an understanding of health promotion concepts rather than understanding and being able to apply these concepts.[27] The newer ADC competency statements have little to no overlap with the IUHPE health promotion competency statements which were released in the same year.[26] However, the older competency ADC statements have some overlap with the IUHPE competency domains of health promotion knowledge and advocacy.[26] In a recent study of the competencies required to successfully undertake an oral health promotion program, the competencies mentioned by participants were in line with the IUHPE competency domains.[25] Considering these findings and the ADC competencies being 6 years old now, there is a need for these ADC competencies to be reviewed and updated using the IUHPE competency domains as a framework to guide development.

5 | STRENGTHS AND LIMITATIONS

This study provides a detailed exploration of health promotion content and which ADC competencies are being addressed in the curriculum of dental and oral health degrees in Australia. However, this mapping has only included the explicit curriculum of each course. An explicit curriculum or formal curriculum is the planned "this is what we do" curriculum. What was not mapped was the implicit or informal curriculum, this is the ad hoc unscripted teaching that occurs in the classroom, or the hidden curriculum, which is what the students experience (the values and culture implicitly conveyed by the educators).[52] Research has shown that the hidden curriculum in some ways is more influential than the formal curriculum.[53] Therefore, this study provides a comprehensive examination of what is planned in health promotion content but cannot provide a definitive insight into what students are receiving in health promotion content. Data on the educator's years of teaching or health promotion experience were not collected in this study. These factors may impact on the hidden curriculum of a course. Additionally, curriculum mapping provides a static snapshot of the curriculum,[32] therefore, this provides an insight into what was occurring in the courses in 2019 which will not reflect any changes to the curriculum since this time.

6 | CONCLUSION AND RECOMMENDATIONS

Poor oral health is an NCD globally and a cause of ill health yet is largely preventable. Oral and dental professionals are well placed to undertake prevention work using evidence-based health promotion approaches. However, this study has shown there are gaps in the health promotion content that oral health and dental students are receiving in their training. Oral health courses were more likely to meet the ADC competencies, however, some dental courses were not meeting these competencies. Graduates from those courses that do not meet health promotion competencies may not be appropriately skilled to undertake health promotion work in practice. The courses which are not meet competency standards could also be at risk of losing professional accreditation by registration boards. However, it is acknowledged that the documented curriculum is not always the taught curriculum; therefore, further research is required

to explore the hidden curriculum of health promotion in dental and oral health degrees. Additionally, research on how training influences health promotion practice post-graduation is required. For a substantial shift in the way health promotion is viewed and valued in dentistry, changes to the current ADC competency statements and structure of funding at a government level is needed.

ACKNOWLEDGEMENTS

Open access publishing facilitated by La Trobe University, as part of the Wiley - La Trobe University agreement via the Council of Australian University Librarians.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ETHICS STATEMENT

Ethical approval to send emails for missing information was gained from La Trobe research ethics committee (ethics number HEC19516) prior to the commencement of the study.

ORCID

Stacey Bracksley-O'Grady https://orcid.org/0000-0003-3204-9442
Karen Anderson https://orcid.org/0000-0001-6595-118X
Virginia Dickson-Swift https://orcid.org/0000-0002-7728-2101
Mohd Masood https://orcid.org/0000-0001-8902-0654

REFERENCES

1. World Health Organization. Ending childhood dental caries: WHO implementation manual. Geneva: World Health Organization; 2019.
2. Peres MA, Macpherson LMD, Weyant RJ, Daly B, Venturelli R, Mathur MR, et al. Oral diseases: a global public health challenge. Lancet. 2019;394(10194):249–60.
3. Do L, Spencer A. Oral health of Australian children: the National Child Oral Health Study 2012–2014. Adelaide: University of Adelaide Press; 2016.
4. Australian Institute of Health and Welfare. Oral health and dental care in Australia. Canberra: AIHW; 2021.
5. Manton D, Foley M, Gikas A, Ivanoski S, McCullough M, Peres M, et al. Australia's oral health tracker: technical paper. Melbourne: Australian Health Policy Collaboration, Victoria University; 2018.
6. Dental Board of Australia. Guidelines for scope of practice. Dental Board of Australia; 2020.
7. Howat P, Maycock B, Cross D, Collins J, Jackson L, Burns S, et al. Towards a more unified definition of health promotion. Health Promot J Austr. 2003;14(2):82–5.
8. Petersen P, Baez RJ, Ogawa H. Global application of oral disease prevention and health promotion as measured 10 years after the 2007 World Health Assembly statement on oral health. Commun Dent Oral Epidemiol. 2020;48:338–48.
9. Schwendicke F, Giannobile W. Research for prevention of oral/dental diseases: how far have we come? J Dent Res. 2020;99(1):5–7.
10. Goldfeld S, Francis KL, Hoq M, Do L, O'Connor E, Mensah F. The impact of policy modifiable factors on inequalities in rates of child dental caries in Australia. Int J Environ Res Public Health. 2019;16(11):1970–86.
11. Bagramian RA, Garcia-Godoy F, Volpe AR. The global increase in dental caries. A pending public health crisis. Am J Dent. 2009;22(1):3–8.
12. Chen V, Foster Page L, McMillan J, Lyons K, Gibson B. Measuring the attitudes of dental students towards social accountability following dental education–qualitative findings. Med Teach. 2016;38(6):599–606.
13. Watt RG, Daly B, Allison P, Macpherson LMD, Venturelli R, Listl S, et al. Ending the neglect of global oral health: time for radical action. Lancet. 2019;394(10194):261–72.
14. Sbaraini A. What factors influence the provision of preventive care by general dental practitioners? Br Dent J. 2012;212(11):E18.
15. Neville P, Waylen A. Why UK dental education should take a greater interest in the behavioural and social sciences. Br Dent J. 2019;227(8):667–70.
16. Bracksley-O'Grady S, Anderson K, Masood M. Oral health academics' conceptualisation of health promotion and perceived barriers and opportunities in dental practice: a qualitative study. BMC Oral Health. 2021;21(1):1–13.
17. Anderson R, Treasure ET, Sprod AS. Oral health promotion practice: a survey of dental professionals in Wales. Int J Health Promot Educ. 2002;40(1):9–14.
18. Bracksley-O'Grady SA, Dickson-Swift VA, Anderson KS, Gussy MG. Health promotion training in dental and oral health degrees: a scoping review. J Dent Educ. 2015;79(5):584–91.
19. Ghasemi H, Murtomaa H, Torabzadeh H, Vehkalahti MM. Perceived barriers to the provision of preventive care among Iranian dentists. Oral Health Prev Dent. 2009;7(4):339–46.
20. Arheiam A, Bankia I, Ingafou M. Perceived competency towards preventive dentistry among dental graduates: the need for curriculum change. Libyan J Med. 2015;10(1):26666.
21. Suga USG, Terada RSS, Ubaldini ALM, Fujimaki M, Pascotto RC, Batilana AP, et al. Factors that drive dentists towards or away from dental caries preventive measures: systematic review and meta-summary. PLoS One. 2014;9(10):e107831.
22. Australian Dental Council. Professional competencies of the newly qualified dentist. Melbourne; Australian Dental Council; 2016.
23. Australian Dental Council. Professional competencies of the newly qualified dental hygienist, dental therapist and oral health therapist. Melbourne; Australian Dental Council; 2016.
24. Gallagher J, Field J. The Graduating European Dentist—domain IV: dentistry in society. Eur J Dent Educ. 2017;21:25–7.
25. Lang AY, Carpenter LM, de Silva AM, Kearney SL, Hegde S. Health promotion competencies for promoting child-oral health: Victorian multidisciplinary workforce perspectives. Health Promot J Austr. 2021;32:126–38.
26. International Union for Health Promotion and Education. IUHPE core competencies and professional standards for health promotion; 2016.
27. Bracksley-O'Grady S, Anderson K, Gussy M. Opinion: do the revised professional competencies of new dental graduates support oral health promotion in Australia? Aust N Zeal J Dental Oral Health Ther. 2019;7(2):29–30.
28. World Health Organization. The Ottawa charter for health promotion. In First International Conference on Health Promotion. Ottawa, Canada; World Health Organization; 1986.
29. Tiwari T, Palatta A, Stewart J. What is the value of social determinants of health in dental education? National Academy of Medicine Web Site. 2020.
30. Harden RM, AMEE Guide No. 21: curriculum mapping: a tool for transparent and authentic teaching and learning. Med Teach. 2001;23(2):123–37.
31. Maart R, Adam R, Frantz J. Curriculum mapping: a tool to align competencies in a dental curriculum. Afr J Health Prof Educ. 2021;13(2):99–104.
32. Spencer D, Riddle M, Knewstubb B. Curriculum mapping to embed graduate capabilities. Higher Educ Red Dev. 2012;31(2):217–31.

33. Ozdemir D, Stebbins C. Curriculum mapping for the utilization of a learning analytics system in an online competency-based master of health care administration program: a case study. J Health Adm Educ. 2015;32(4):543.
34. Mazurat R, Schönwetter DJ. Electronic curriculum mapping: supporting competency-based dental education. J Can Dent Assoc. 2008;74(10):886–9.
35. Krathwohl DR. A revision of Bloom's taxonomy: an overview. Theory Pract. 2002;41(4):212–8.
36. Goozee G. The development of TAFE in Australia. Leabrook: National Centre for Vocational Education Research; 2001.
37. World Health Organization. Health promotion glossary. Geneva: World Health Organization; 1998, p. 1–36.
38. Australian Dental Council. ADC professional attributes and competencies of newly qualified dentist. Melbourne: Australian Dental Council; 2010.
39. Australian Dental Council. ADC professional attributes and competencies of a newly qualified oral health therapist. East Melbourne: Australian Dental Council; 2010.
40. Starr CW, Manaris B, Stalvey RH. Bloom's taxonomy revisited: specifying assessable learning objectives in computer science. ACM SIGCSE Bulletin. 2008;40(1):261–5.
41. Holden AC, Leadbeatter D. Conceptualisations of the social determinants of health among first-year dental students. BMC Med Educ. 2021;21(1):1–12.
42. Neville P, Zahra J, Pilch K, Jayawardena D, Waylen A, The behavioural and social sciences as hidden curriculum in UK dental education: a qualitative study. Eur J Dent Educ. 2019;23(4):461–70.
43. Tan AS, Anderson VR, Foster Page LA. Second and third year oral health and dental student perceptions of future professional work. Eur J Dent Educ. 2013;17(4):241–50.
44. Anderson V, Kang M, Foster Page L. First-year oral health and dentistry student perceptions of future professional work. Eur J Dent Educ. 2012;16(1):e166–73.
45. Nutbeam D. Health education and health promotion revisited. Health Educ J. 2019;78(6):705–9.
46. Sunell S, Laronde DM, Kanji Z. Dental hygiene graduates' educational preparedness: self-confidence ratings of the CDHA baccalaureate competencies. Int J Dental Hygiene. 2020;18(3):295–306.
47. Richards W. Caries, change and the dental profession. Br J Healthcare Manage. 2011;17(3):101–7.
48. Watt RG. Strategies and approaches in oral disease prevention and health promotion. Bull World Health Organ. 2005;83(9):711–8.
49. Duckett S, Cowgill M, Swerissen H. Filling the gap: a universal dental scheme for Australia. Grattan Institute; 2019.
50. Watt RG, Williams D, Sheiham A. The role of the dental team in promoting health equity. Br Dent J. 2014;216(1):11–4.
51. Bedos C, Apelian N, Vergnes J-N. Social dentistry: an old heritage for a new professional approach. Br Dent J. 2018;225(4):357–62.
52. Hafferty FW. Beyond curriculum reform: confronting medicine's hidden curriculum. Acad Med. 1998;73(4):403–7.
53. Lawrence C, Mhlaba T, Stewart KA, Moletsane R, Gaede B, Moshabela M. The hidden curricula of medical education: a scoping review. Acad Med. 2018;93(4):648–56.

SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

How to cite this article: Bracksley-O'Grady S, Anderson K, Dickson-Swift V, Masood M. Curriculum mapping of health promotion competencies in dental and oral health training programmes in Australia. Health Promot J Austral. 2022;33(S1):98–113. https://doi.org/10.1002/hpja.576