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SYSTEMATIC REVIEW

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A systematic review of dentists' knowledge, perception, practice and confidence in managing patients with cancers

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Abstract

Purpose Little is known about dentists' preparedness in managing oral side effects in patients undergoing cancer therapy (CTx). The purpose of this systematic review is to identify barriers and facilitators of dentists in managing oral health of cancer patients (CPs).

Methods The review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and was Prospero registered (CRD42022333055). CINAHL, Embase, Medline, PsycInfo and Scopus databases were searched using keywords and MeSH terms: dentists, oral health, cancer. The outcomes were analysed descriptively and thematically.

Results Of the 2303 articles screened 53 met eligibility criteria. Most of articles ($n=50$) reported on head and neck cancer (HNC) management. Dentists' oral cancer (OC) knowledge varied across studies (27% to 81%, $n=35$). Regardless of their knowledge level, the majority of dentists expressed interest in further cancer education. Across studies, dentists perceived that their role included providing dental treatment for OC patients. However, of the few studies ($n=3$) that explored dentists' confidence in managing CPs, less than half of dentists felt confident providing advice to patients with HNC. More barriers than facilitators are identified in providing dental care provision to CPs.

Conclusion This review demonstrates gap in dental care for patients with non-HNCs and highlights a need for methods to involve dentists in managing dental health of CPs.

Keywords Dentist, Oral health, Cancer patient, Barriers

Introduction

Patients undergoing CTx have unique oral and dental needs as cancer and its treatment often have direct and indirect impact on oral health. Attentive dental care tailored to the needs of CPs reduces oral complications [1–3], improves quality of life [4, 5], reduces mortality [6, 7] and healthcare costs [8]. To facilitate better oral care, internationally there have been a number of best practice guidelines developed (for example Elad, Cheng [9]), however the oral health of CPs receiving CTx is often overlooked and patients do not receive timely information about oral complications or oral care [10].

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Traditionally, oncology patients have been managed in specialised cancer centres, however most cancer centres do not have a dental department [11], and dentists are seldom included in the oncology multidisciplinary team [10] unless treatment is focused specifically on the head and neck (H&N) region. This occurs despite patients with solid tumours outside of H&N region also experiencing chemotherapy-related mucositis, apthous ulcers and xerostomia [12]; patients receiving bone modifying agents, targeted and immunotherapies being at increased risk of osteonecrosis of the jaw [13, 14]; patients on targeted therapies experiencing oral pain, dry mouth and stomatitis [15]; and survivors of allogenic haemopoetic stem cell transplant (HSCT) patients experiencing long term oral side effects as a result of immune response to the transplantation.

With the increasing number of patients being diagnosed with cancers each year and undergoing CTx, there is an increasing need for dentists to be included in managing the oral health of these patients. Dentist's understanding the potential oral side effects is critical as this knowledge will ensure dentists are able to discern dental disease from the transient effects of therapies and take appropriate precautions when managing oral health of these patients [16, 17]. Given the important and yet under-utilised role dentists have in the care of CPs, the aim of this review was to understand the barriers and facilitators of dentists' management of the dental health of CPs undergoing cancer treatment. Specifically, this systematic review explored dentists' cancer knowledge, perceptions, clinical practice and confidence of treating CPs.

Methodology

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [18] and was preregistered with the International Prospective Register for Systematic Reviews (CRD42022333055). It included both qualitative and quantitative studies capturing dentists' knowledge, perception, clinical practice and confidence in managing the oral health of cancer patients.

Search strategy

Medline, Embase, CINAHL, PsycInfo and Scopus were searched using keyword and MeSH terms: "dentist*", "dental specialist*", "dental surgeon*", "oral health professional*", "dental practi*"; "oral health*", "dental care", "oral care", "oral hygiene", "mouth hygiene"; "neoplasm", "cancer*", "oncology*", "malignan*". Broad search terms were used as our preliminary search with narrow terms did not capture relevant studies. The search was conducted in 2022 and updated in July 2023. Reference lists of review articles were also manually searched. An example of search strategy is included in supplementary file 1.

Inclusion and exclusion criteria

Studies were included if they were in adult population and published in English between 1990 and July 2023. Review articles, conference abstracts or expert opinions were excluded.

Participants

This review included studies with general dentists (GDPs) and specialist dentists (SDs), while excluding studies involving dental students and dental auxiliaries such as hygienists, oral health therapists and dental assistants.

Study designs

We included qualitative and quantitative studies reporting dentists' knowledge, perceptions, practice and confidence related to cancer screening, management and clinical practice.

All search results were initially uploaded into EndNote X20 (Clarivate, Philadelphia, PA, USA, 2022).

and duplicates removed. Abstracts were uploaded into Covidence (Veritas Health Innovation, Melbourne, Australia) and two reviewers (SL and JS) independently screened titles and abstracts. For studies that appeared to meet criteria, full text articles were retrieved and reviewed against the eligibility criteria. Disagreements were resolved through discussion.

Data extraction

Data extraction was conducted using a purpose-designed template (SL) and 20% of articles were reviewed by a second reviewer (JS) to assess accuracy. Data extracted included: participants' characteristics (age, gender, experience, training background, recency of continuing education (CE), location of practice and workplace characteristics); study characteristics (country, research methods, recruitment strategies, sample size, cancer population) and outcomes of interest (dentists' cancer and CTx knowledge, perceptions on education, role in cancer management, clinical practice, and confidence). Quality was assessed based on the Mixed Methods Assessment Tool (MMAT) [19].

Data analysis

Quantitative data was summarised descriptively, qualitative data were analysed using content analysis. Reported barriers and facilitators were categorised as: environmental/ context, dentist-related and patient factors.

Results

Database searches identified a total of 3,979 studies, with additional 20 abstracts found through hand searching. After removing duplicates, a total of 2,303 titles and abstracts screened. Full text review of 70 articles resulted in 53 articles identified for inclusion in the review (see Fig. 1 for PRISMA diagram).

Study characteristics

Of the 53 studies identified, the majority ($n=50$) focused on H&N regions. Of the non-HNCs ($n=3$), 1 study explored management of leukemia patients [20] and 2 studies [21, 22] explored treatment of oncology patients more broadly. The study designs were primarily surveys ($n=51$), with 1 study using a qualitative focus group methodology [23] and 1 study using a mixed methods approach [24]. Seven studies focused solely on oral screening practices [25–31].

Mean sample size was 315 (range 32–3200). Studies were most commonly surveying dentists from USA ($n=16$), Middle East ($n=11$) or UK ($n=7$). Five studies were conducted in Asia, with studies also conducted in Brazil ($n=4$), Spain ($n=2$), Australia ($n=2$), Africa ($n=2$), Canada ($n=1$), and Italy ($n=1$). Additionally, 2 studies conducted in combined regions: Australia/ Japan and Australia/ New Zealand. Study characteristics are summarised in Table 1.

Participants characteristics

Studies included participants who were GDPs ($n=34$), SDs (prosthodontists, restorative dentists and maxillofacial surgeons) ($n=5$); or a combination of GDPs and SDs ($n=14$). Studies reporting gender participants ($n=36$), 38% were female (range 11—79.9%). Forty studies reported participant's clinical practice experience. Among 24 studies reporting range of years, 10 studies reported 32.6% of participants had < 5 years dental experience, 20.9% had 6–10 years and 46.3% had ≥ 10 years' experience. Additionally, 10 studies reported a mean clinical practice duration of 11.9 ± 5.1 years. Of the studies reporting workplace characteristics ($n=30$), 10 studies recruited participants from solo, partner, salaried, employee and community practices; 21 studies classified workplaces based on funding models (public vs private), of which 54.1% of dentists worked in public sector, 41.3% worked in private sector and 4.4% worked in both public and private settings.

Fourteen studies reported on the recency of OC CE, with approximately half of dentists reporting undertaking CE within the last 5 years [27, 28, 33, 40, 41, 43–51].

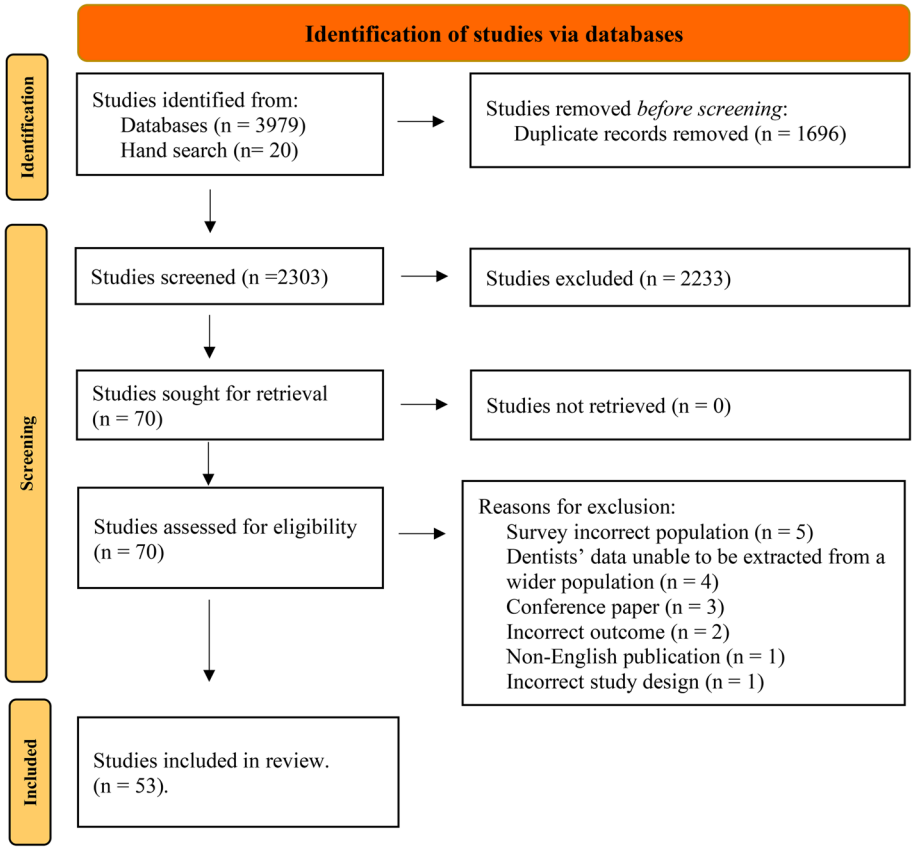

Fig. 1 Systematic reviews and meta-analyses (PRISMA) flow chart

Table 1 Study characteristics

ID	Authors, publican year	Aims	Country	Research methods	Recruitment strategies	Actual sample size	Cancer population	Data analysis
1	Ahmed & Naidoo (2019) [32]	To determine dentists' knowledge, attitudes, and practices in the prevention and early detection of OCs. To evaluate CE needs	Khartoum, Sudan	Quantitative (survey)	130 GDPs working in public dental clinics	*n* = 113 (87% RR)	OC	T t-test, Mann–Whitney U test & Chi-square tests
2	Akbari et al. (2015) [33]	To assess the GDPs' and dental SDs' knowledge about OC in South Khorasan, Iran	Iran	Quantitative (survey)	80 practicing GDPs & SDs taking part in CE	*N* = 73 (91% RR)	OC	Descriptive analysis. Chi square, t-test
3	Alhazzazi (2021) [34]	To assess the knowledge & behaviour of dentists toward screening & managing patients with HNC	Saudi Arabia	Quantitative (survey)	*n* = 723 GDPs & SDs	*N* = 206 (28.5% RR)	HNC	Descriptive analysis. Chi-square test
4	Alonge et al. (2004) [35]	To determine dentists' OC knowledge & OC screening practices, & preferred methods for OC CE	Texas, USA	Quantitative (survey)	398 Texas dentists practicing along the Texas-Mexico border	*n* = 158 (40% RR)	OC	Bivariate analysis (Chi-square test)
5	Alqahtani et al. (2021) [36]	To investigate the knowledge & awareness among dentists in Saudi Arabia towards oral & dental assessment and management of HNC patients pre and post-RT	Saudi Arabia	Quantitative (survey)	Google form via an online link though WhatsApp or Social Media Platforms	370 responded	HNC	Descriptive analysis
6	Alqutaibi et al. (2021) [25]	To assess prosthodontis' knowledge of & screening practices for OC and potentially malignant oral lesions	Saudi Arabia	Quantitative (survey)	*n* = 250 eligible prosthodontists	*n* = 143 (57% RR)	OC	Descriptive analysis using Chi-square test
7	Borhan-Mojabi (2012) [37]	To evaluate the degree of knowledge of physicians and GDPs on OC within the context of developing an appropriate under- & post-graduate education programme to optimize early detection & prevention of OC	Qavzin, Iran	Quantitative (survey)	Dentists: *n* = 100, Physicians: *n* = 100	Dentists *n* = 86 (86% RR); Physicians *n* = 66 (66% RR)	OC	Descriptive analysis using t-test, chi-squared, ANOVA, Pearson correlation
8	Calvert et al. (2014) [38]	To record the current practice of restorative dentistry consultants in immediate, initial, & long-term management of patients diagnosed HNC	UK	Quantitative (survey)	315 restorative consultants from General Dental Council website	*n* = 132 (43% RR), 60 of the 132 treated H&N patients	HNC	Not reported. Data presented as charts and histograms
9	Canto et al. (2001) [39]	To assess dentists' knowledge of risk factors and diagnostic procedures for OC	Maryland, USA	Quantitative (survey)	1000 GDPs selected from ADA Maryland mailing list	*n* = 508 usable questionnaires (54% RR)	OC	Descriptive analysis & logistical analysis
10	Clovis et al. (2002) [40]	To assess and describe Canadian dentists' understanding of risk & diagnostic factors related to OC and to determine their opinions about their professional preparation to prevent & control OC	British Columbia & Nova Scotia	Quantitative (survey)	Systematic random sample of 817 licensed dentists from British Columbia *n* = ?? from Nova Scotia	*n* = 670 (55.2% RR) [*n* = 401 (50.4%RR) British Columbia; *n* = 269 (64.4%) Nova Scotia]	OC	Descriptive analysis using ANOVA
11	Colella et al. (2008) [41]	To investigate dentists and physicians' level of knowledge, attitudes, & behaviours towards OC	Campania region, Italy	Quantitative (survey)	1000 professionals attending 22 randomly selected association meetings	*n* = 457 (45.7% RR) [Dental: *n* = 225 Medical: *n* = 232]	OC	Descriptive analysis

Table 1 (continued)

ID	Authors, publican year	Aims	Country	Research methods	Recruitment strategies	Actual sample size	Cancer population	Data analysis
12	Cruz et al. (2005) [26]	To examine OC prevention and early detection practice patterns in OHPs. To examine if there were any variables that were associated with lower adherence to recommended health behaviour counselling	NY, USA	Quantitative (survey)	Stratified random sample of licensed dentists ($n=904$) and DHs ($n=963$)	Dentists: $n=496$, DHs: $n=630$	OC	Descriptive Bivariate analysis
13	Daley et al. (2011) [23]	To assess awareness among OHP regarding the HPV-OC link. To elicit OHP attitudes & perceived role to screen for HPV-related oral lesions, & to discuss HPV as OC risk factors & HPV vaccine with patients	Florida, USA	Qualitative (focus group)	Dentists or DHs recruited from local dental & dental hygiene professional associations	dentists: 3 focus groups (total n = 17) dental hygienists: 2 focus groups (total $n=21$)	OC	Qualitative analysis. Coding of data
14	Dang et al. (2022) [21]	To assess dental practice patterns in oral care of medical oncology patients & to identify potential barriers to recommended care in the state of Massachusetts	Massachusetts, USA	Quantitative (survey)	Registered dentists at Massachusetts Dental Society. $n=3394$	$n=363$ (10.7%RR)	All cancers	Descriptive analysis. Qualitative coding for free text responses
15	Dewan et al. (2014) [42]	To investigate the approach of restorative dentists in the treatment & dental rehabilitation of OC patients in the UK	UK	Quantitative (survey)	Delegates at the conference ($n=94$)	$n=65$ (69.1% RR)	OC	Descriptive analysis

ADA Australian Dental Association, *AmDA* American Dental Association, *CE* Continuing education, *DH* Dental hygienist, *DT* Dental therapist, *GDP* General dental practitioner, *H & N* Head and neck, *HNC* Head and neck cancer, *OC* Oral cancer, *OCE* Oral cancer examination, *OHP* Oral health practitioner, *OPC* Oropharyngeal cancer, *RR* Response rate, *RT* Radiation therapy, *SD* Specialist dentist

Participant characteristics are summarised in Table 2.

Study outcomes

Knowledge

Thirty-five studies explored dentists' cancer knowledge, with no studies exploring cancers outside of H&N regions. Twenty-eight evaluated OC knowledge, 24 surveyed OC identification skills, 25 assessed OC risk factors and 2 studied CTx side effects (see supplementary file 2 in the Appendix).

Cancer knowledge

There was significant variability in dentists' overall OC knowledge across studies, with correct responses ranging from 27% [35] to 81.3% [62]. In 4 of 5 studies, >90% of dentists recognised that early detection of OC improves patient survival rates [40, 51, 60, 66]. Several factors were identified to be positively associated with OC knowledge. Recent CE ($n=7$) [28, 37, 39, 41, 46, 47, 59], recent dental graduates ($n=7$) [32, 33, 39, 49, 50, 69, 70], SDs in oral surgery/ pathology ($n=2$) [36, 41] and dentists with experience in public settings ($n=4$) [36, 49, 50, 59] reportedly had significantly better OC knowledge. Dentists who rated their undergraduate OC training favourably were more likely to agree that their OC knowledge was current [60], and 2.2 times more likely to score higher on knowledge of OC [49]. In terms of gender, 3 studies found female dentists faired significantly better in OC knowledge [47, 50, 62], while others found no significant influence of gender on OC knowledge [54, 60, 69].

Cancer identification skills

To evaluate OC identification skills, the domains assessed included knowledge of sites, signs and symptoms of OC. There was a considerable degree of variability in survey responses. Notably, recent CE ($n=2$) were found to positively correlated with skills in OC identification [40, 41]. Nevertheless, our findings showed divergent relationship between clinical experience and cancer identification skills amongst dentists. Two studies found recent graduates had better skills [40, 69] while 2 studies indicated that dentists with more clinical experience [47, 52] were better at OC identification. Additionally, Maybury et al. [47] found that dentists working in a group private practice were more likely to have better OC identification skills than dentists working in solo private practice.

OC risk factors

Of the studies that explored common OC risk factors such as alcohol and tobacco use ($n=23$), 19 studies reported >80% of participants identified alcohol [35, 39, 40, 43–52, 60, 62, 63, 69, 70, 72] as a risk factor while 21 studies reported >80% of participants identified tobacco as a risk factor for OC [35, 39–41, 43–52, 55, 60, 62, 63, 67, 69, 70]. In all 12 studies, [35, 39–41, 43, 45–47, 51, 52, 60, 69] exploring prior OC risk, >80% of participants

Table 2 Participants characteristics

ID	Authors (publican year)	Age	Gender (female n/%)	Experience	Training background	Recency of oncology CE	Location of practice (n/%)	Workplace characteristics (n/%)
1	Ahmed & Naidoo (2019) [32]	NR	*n* = 77 (68.1%)	3–5 years (35.4%), 6–10 years (42.5%), 11–15 years (11.5%) > 15 years (10.6%)	GDPs	NR	NR	Public: *n* = 113 (100%)
2	Akbari et al. (2015) [33]	NR	*n* = 36 (49%)	1–4 years: *n* = 31 (42.5%), 5–9 years: *n* = 11 (15.1%), 10–14 years: *n* = 10 (13.7%), 15–19 years: *n* = 5 (6.8%) > 20 years: *n* = 16 (21.9%)	GDPs: (*n* = 55, 75%), SDs: (*n* = 18, 25%)	24.7% attended OC CE courses	NR	NR
3	Alhazzazi (2021) [34]	NR	*n* = 81 (39%)	0–2 years: 96 (47%), > 2–5 years: 31 (15%), > 5–10 years: 18 (9%), > 10 years: 61 (30%)	GDPs: *n* = 119 (58%), SDs: *n* = 14 (7%), dental consultants: *n* = 49 (24%), dental residents: *n* = 14 (7%), others: *n* = 3 (5%)	NR	NR	Public: *n* = 50 (24%), Private: *n* = 61 (30%), University hospital: *n* = 69 (33%), Mixed public & private: *n* = 8 (4%), mixed university & private: *n* = 16 (8%)
4	Alonge & Narendran (2004) [35]	20–29 years (*n* = 5, 3%), 30–39 years (*n* = 35, 22%), 40–49 years (*n* = 48, 31%), 50–59 years (*n* = 44, 28%), 60–69 years (*n* = 17, 11%), 70–79 years (*n* = 7, 5%), missing data (*n* = 2)	*n* = 21, 14% missing data (*n* = 2, 1%)	0–8 years (*n* = 25, 16%), 9–18 years (*n* = 46, 30%), 19–28 years (*n* = 48, 31%), 29–38 years (*n* = 35, 23%)	GDPs	NR	NR	Solo: *n* = 114 (72%) Others: *n* = 44 (28%)
5	Alqahtani et al. (2021) [36]	NR	*n* = 113 (31%)	< 5 years: *n* = 185 (49.5%), 5–10 years: *n* = 120 (32.4%), > 10 years: *n* = 67 (18.1%)	GDPs: *n* = 144 (39%), oral surgeons/ oral meds/ oral pathologists: *n* = 57 (15%), endodontists: *n* = 34 (9%), periodontists: *n* = 21 (9%), other specialists: *n* = 87 (23%)	NR	NR	Public: *n* = 352 (95.1%); Private: *n* = 18 (4.9%)
6	Alqutaibi et al. (2021) [25]	NR	*n* = 36 (25%)	< 10 years: *n* = 79 (55%); ≥ 10 years: *n* = 64 (45%)	Prosthodontists: 100%; master degree: *n* = 49 (34.3%); board certified: *n* = 42 (29.4%); PhD: *n* = 52 (36.4%)	NR	NR	Public: *n* = 120 (84%); Private: *n* = 23 (16%)
7	Borhan-Mojabi (2012) [37]	GDPs: 37.93 ± 9.22 years	Data not separated for GDPs	GDPs: 9.67 ± 9.05 years	GDPs	NR	NR	NR
8	Calvert et al. (2014) [38]	NR	NR	NR	Restorative dentists	NR	NR	NR
9	Canto et al. (2001) [39]	NR	19%	> 25years: 23%; 16-25years: 28%; 6-15years: 34%; < = 5 years: 15%	GDPs	NR	NR	Solo: 60%, partner: 17%, salaried/ contractor: 19%, all other: 4%

Table 2 (continued)

ID	Authors (publican year)	Age	Gender (female n/%)	Experience	Training background	Recency of oncology CE	Location of practice (n/%)	Workplace characteristics (n/%)
10	Clovis et al. (2002) [40]	NR	*n* = 117 (17.9%)	> 27 years): *n* = 88 (13.3%); 18–27 years: *n* = 196 (29.6%); 8–17 years: *n* = 229 (34.5%); ≤ 7 years: *n* = 150 (22.6%)	GDPs	~ 60% attended OC CE in the last 5 years,	NR	Solo: *n* = 370 (55.4%), partner: *n* = 177 (26.5%), salaried or contractor: *n* = 93 (13.9%), others: *n* = 28 (4.2%)
11	Colella et al. (2008) [41]	NR	*n* = 80 (17.5%)	≤ 15 years: *n* = 186 (40.7%); 16–20 years: *n* = 99 (21.7%); 21–25 years: *n* = 80 (17.5%); 26–30 years: *n* = 67 (14.7%); > 30 years: *n* = 25 (5.4%). Mean years of graduation is 18 years	Dentists (graduates from medical school: *n* = 232, 50.8%; graduates from dental school: *n* = 225, 49.2%). GDPs: 53%, oral surgeons: 17.9%, restorative dentists/ endodontists: 9.9%, orthodontists: 7.4%, periodontics: 5.9%, oral pathologists: 3.5%, prosthetists: 2.4%	96.1% received OC information & 20.6% attended CE course on OC in the last 12 months Main sources of info were educational (72.4%), scientific journals (22.8%)	NR	Solo: *n* = 155 (33.9%) non-solo: *n* = 302 (66.1%)
12	Cruz et al. (2005) [26]	20-39years: 19%; 40–59 years: 62%; 60 & older: 98%	13%	Median years since graduation: 24 years	Dentists and DHs	NR	NR	Solo practice: 60%; partner/ employee: 26%; independent contractor: 4%; specialty practice: 4%; public health/ government/ other: 5%
13	Daley et al. (2011) [23]	28–66 years (mean age 45 years)	*n* = 8 (47%)	3–43 years (mean 19 years)	Accredited US program Dentists, DHs	NR	NR	NR
14	Dang et al. (2022) [21]	NR	NR	NR	Dentists	NR	NR	Private practice: 89%, community health centre: 4%, Hospital-based: 4%, dental school-based practice: 3%
15	Dewan et al. (2014) [42]	NR	NR	NR	Consultants or senior lecturers: *n* = 30 (46.1%); specialist registrars: *n* = 27 (41.5%). SDs in restorative dentistry: *n* = 8 (12.3%)	NR	NR	NHS posts (public): 73%; Academic posts: 27%
16	Dixon et al. (2021) [24]	46.8/13.7	*n* = 76 (49.35%)	< 10years: *n* = 37 (24%); 10-19years: *n* = 29 (18.8%); 20–29 years: *n* = 31 (20.1%); 30–39 years: *n* = 35 (22.7%); 40–49 years: *n* = 19 (12.3%); > 50 years: *n* = 3 (1.9%)	NZ trained dentists: *n* = 103 (66.9%). Interviews: 4 dentists in Sydney West Cancer Network	NR	Urban: *n* = 131 (85.1%); Rural: *n* = 23 (14.9%)	Public: n = 7 (4.5%); Private: *n* = 129 (83.8%); Working in both public & private: *n* = 14 (9.1%); Not practicing: *n* = 4 (2.6%); Public experience: *n* = 21 (14%)
17	Ekici (2020) [43]	25–34 years: *n* = 67 (22.8%); 35–44 years: *n* = 104 (35.4%); 45–54 years: *n* = 108 (36.7%); ≥ 55: *n* = 15 (5.1%)	*n* = 199 (60.2%)	1–5 years: *n* = 33 (11.2%); 6–10 years: *n* = 35 (11.9%); 11–15 years: *n* = 69 (23.5%); 16–20 years: *n* = 48 (16.3%); > 20 years: *n* = 109 (37.1%)	GDPs	10% had OC training in the past 5 years	NR	Public (*n* = 294/ 100%)

Table 2 (continued)

ID	Authors (publican year)	Age	Gender (female n/%)	Experience	Training background	Recency of oncology CE	Location of practice (n/%)	Workplace characteristics (n/%)
18	Fidele et al. (2022) [52]	Mean: 33.2 ± 4.3 years. 23–29 years: 3.7%; 30–39 years: 54.3%; 40–49 years: 25.9%; 50–59 years: 11.1%; > 60 years: 4.9%	*n* = 56 (34.6%)	< 5 years: 30.9%; 5–10 years: 50.6%; 11–15 years: 9.9%; > 15 years: 8.6%	General practice: 81.5%; Specialty practice: 18.5%	NR	NR	NR
19	Frydrych et al. (2012) [53]	NR	NR	0–5 years: 27.1%; 6–10 years): 12.6%; 11–15 years: 12.6%; 16–20 years: 5.3%; 21–25 years: 10%; > 25 years: 31.1%; Unknown: 1.3%	GDPs, SDs were excluded for analysis (*n* = 5)	NR	Urban (*n* = 140/ 76%); Rural (*n* = 44/ 23.90%)	Public: *n* = 19 (10.30%); Private: *n* = 166 (89.70%)
20	Gajendra et al. (2006) [44]	20–39 years: 19%; 40–59 years: 61%; 60 or older: 20%	13%	Median years of experience 24 years	Dentists, DHs	80% of dentists attended OC prevention CE courses in past 5 years	NR	Solo: 59.8%; specialty practice: 4.1%; public health/ government: 2.5%; partner: 17%; employee: 9.4%; independent contractor: 4.3%; other: 2.9%
21	Guneri et al. (2008) [54]	32.76 years (this includes students)	*n* = 92 (45%)	1–35 years (mean 11.29 years)	GDPs: *n* = 113 (55.35%); final year dental students: *n* = 37 (18.13%); SDs: *n* = 54 (26.47%)	NR	NR	NR
22	Haresaku et al. (2018) [55]	Most dentists in Japan & Australia were > 46 years of age (23.8–40.2%)	Japanese: 7.3%; Australia: 45.8%	NR (data cannot be separated from hygienists)	Not specified. The study excluded Australian specialists who did not see OC patients	NR	NR	NR
23	Hashim et al. (2018) [45]	< 30 years: *n* = 204 (68.2%); > 30 years: *n* = 81 (27.1%)	*n* = 169 (57%)	< 15 years: *n* = 275 (92.3%); > 15 years: *n* = 23 (7.7%)	Bachelor degree: *n* = 256 (85.6%); MSc/ PhD: *n* = 41 (13.7%). GDPs & SDs	48% attended an OC CE within the past 5 years	NR	Public: *n* = 31 (10.50%); private: *n* = 267 (89.50%)
24	Horowitz et al. (2000) [56]	NR	14%	16–20 years: 22%; 11–15 years: 28%; 6–10 years: 33%; 0-5years: 17%	GDPs	NR	NR	Solo: 68%; partnership: 12%; others: 6%
25	Husein et al. (2011) [57]	NR	NR	> 10 years: *n* = 161 (81%); 5–10 years: *n* = 19 (10%); < 5 years: *n* = 18 (9%)	UK graduates GDPs: *n* = 177 (89%)	NR	NR	GDPs working in mixed, mainly NHS practice: 55%; GDPs working in solely private practice: 5%
26	Joseph et al. (2012) [46]	< 40 years: 60.6%; > 40 years: 39.4%	*n* = 35 (22.9%)	> 15 years: 44.4%; = < 15 years: 55.6%	Dentists	30% attended OC CE within the last 5 years	NR	Public: *n* = 153 (100%)

Table 2 (continued)

ID	Authors (publican year)	Age	Gender (female n/%)	Experience	Training background	Recency of oncology CE	Location of practice (n/%)	Workplace characteristics (n/%)
27	Kogi et al. (2019) [58]	NR	28.2%	< 1 year: 35.5%; 2–5 years: 20.9%; 6–15 years: 20.9%; > 16 years: 26.4%	Restorative dentists (operative, endodontics, periodontics, prosthodontics): 60.9%; non-restorative dentists (dental anaesthesiology, dental public health, dental radiology, orthodontics, paediatric): 39.1%	NR	NR	NR
28	Kujan et al. (2006) [27]	NR	NR	43–52 years: *n* = 1 (3%); 33–42 years: *n* = 50 (14.8%); 23–32 years: *n* = 104 (30.8%); 13–22 years: *n* = 113 (33.5%); 0–12 years: *n* = 66 (19.5%)	GDPs and SDs	52.3% SDs & 26.3% GDPs attended OC CE in the last 12 months	NR	NR
29	Leão et al. (2005) [59]	40.4 years/ 12.9	52%	Mean: 16 years	GDPs	NR	Urban: *n* = 129 (100%)	Public: 38%; Private or public/private: 62%
30	LeHew et al. (2010) [28]	NR	*n* = 28 (27.5%)	Median: 13 years (range 0–50 years)	GDPs: 90%; SDs (orthodontics, oral surgery, endodontics, peadiatrics, prosthodontics): 10%	37.3% never attended OC CE	NR	NR
31	Lopez-Jornet et al. (2010) [60]	NR	40.3%	Mean: 13.3 years (1- 42 years)	GDPs	NR	NR	NR
32	Marino et al. (2017) [29]	≤ 25 years: 7.4%; 26–35 years: 19%; 36–45 years: 23.2%; 46–55 years: 25.2%; > 55 years: 25.2%	44.2%	≤ 5 years: 15.7%; 6–10 years: 12.4%; 11–15 years: 11.6%; 16–20 years: 9.9%; 21–25 years: 9.9%; > 25 years: 40.5%	GDPs: 63.6%; SDs: 8.4%; DHs: 13.7%; Oral health therapists: 12.2%; Dental therapists: 2.1%	NR	Urban: 76.60%; Rural: 23.40%	NR
33	Martins et al. (2021) [61]	20–30 years: 41.07%; 31–40 years: 34.64%; 41–50 years: 14.28%; 51–60 years: 6.7%; > 60 years: 3.21%. Most were 20–40 years	*n* = 195 (69.64%)	Time in specialty: < 5 years = 43.92%; 5–10 years = 12.85%; 10–20 years = 18.21%; > 20 years = 25%	Group A: *n* = 160 (57.14%) working in oral oncology Group B: *n* = 120 (42.86%) OMFS (*n* = 25), orthodontics (*n* = 21), oral rehabilitation/ prosthodontics (*n* = 20), paediatric dentistry (*n* = 14), endodontics (*n* = 13), dentistry specialists (*n* = 11), periodontics (*n* = 10), forensic/social legal dentistry (*n* = 6)	NR	NR	NR
34	Maybury et al. (2012) [47]	NR	*n* = 107 (24%)	< 10 years: 14%; 10–19 years: 15%; 20–29 years: 35%; 30–39 years: 34%; ≥ 40 years: 2%	GPDs	OC CE course: Within the last 12 months: 29%; 2–5 years: 54%; ≥ 5 years: 15%. Never taken a course: < 1%	NR	Solo practice: 62%; group private practice: 36%; community health centre: 1%; other: 1%

Table 2 (continued)

ID	Authors (publican year)	Age	Gender (female n/%)	Experience	Training background	Recency of oncology CE	Location of practice (n/%)	Workplace characteristics (n/%)
35	McCann et al. (2000) [48]	NR	NR	NR	GDPs	GDPs: 44% had OC training in the last 2 years, 25% had OC training in 3–5 years, 17% had no OC training for > 10 years	NR	Public: n = 73 (32%); private: *n* = 152 (68%)
36	Nazar et al. (2022) [62]	25.8 ± 2.4 years	*n* = 139 (44.8%)	Mean: 1.5 ± 1.7 years	Bachelor degree: 94.5%; Master degree: 2.6%; MFDS: 1.9%; MEGD: 0.3%; PhD: 0.6%	NR	NR	100% of participants worked at polyclinics, specialty dental centres and School of Oral Health Program clinics as part of their rotation
37	Nazar et al. (2019) [63]	35.2/ 10.9 years	*n* = 109 (37.7%)	Mean: 11.7/ 11.3 years	Bachelor degree: 75%; Master degree, MEGD or PhD: 25%	NR	NR	Public: *n* = 289 (100%)
38	Nicholls & Ilankovan (1998) [64]	NR	NR	NR	Oral maxillofacial surgeons	NR	NR	NR
39	Patel et al. (2012) [65]	NR	NR	< 10 year: *n* = 65 (15.9%); 10–19 years: *n* = 62 (15.1%); 20–29 years: *n* = 121 (29.5%); 30–39 years: *n* = 109 (26.6%); ≥ 40 years: *n* = 53 (12.9%)	Dentists & Radiation oncologists	NR	NR	NR
40	Patton et al. (2006) [66]	NR	NR	NR	Dentists, DHs, physicians, nurse practitioners	NR	NR	NR
41	Pavão Spaulonci et al. (2018) [49]	NR	NR	NR	Junior dentists: 55.9% GDPs, 38.1% specialists; Senior dentists: 56.2% specialists, 21% GDPs, 15.2% Master degree, 7.6% PhD	Attended OC CE: 15.9% in the last year, 23.3% in the last 2 years, 37.6% > 2 years ago	NR	NR
42	Reed et al. (2010) [67]	Not separated for dentists	NR	NR	GDPs & SDs, physicians & medical specialists	NR	NR	NR
43	Saleh et al. (2014) [50]	≤ 30 years: 35.1%; 31–40 years: 26.2%; 41–50 years: 19.9%; 51–60 years: 15.2%; 61–70 years: 2.8%; 71–80 years: 0.8%	*n* = 247 (68.2%)	50.8% graduated > 10 years ago	Place of graduation: Malaysia (72.4%), Asia (18%), Oceanic (4.1%), UK (2.8%), Others (2.8%). Postgraduate training 21.5%	Number of OC CE attended: 0: 26.5%; 1–5: 67.4%; > 5: 6.1%	NR	Public: 50.3%; private: 48.6%; both public & private: 1.1%
44	Seals (1990) [68]	NR	NR	NR	Recent graduate dentists	NR	NR	NR
45	Seoane et al. (2006) [30]	NR	NR	Mean: 9.1/ 5.9 years	GDPs	NR	NR	NR

Table 2 (continued)

ID	Authors (publican year)	Age	Gender (female n/%)	Experience	Training background	Recency of oncology CE	Location of practice (n/%)	Workplace characteristics (n/%)
46	Shadid & Habash (2023) [69]	> 30 years: 65.7%	43.7%	≤ 5 years: 33.5%; 6–15 years: 42.5%; > 15 years: 24%	GDPs: 79.9%; SDs: 20.1%	NR	NR	Public: *n* = 8 (3.20%); private: *n* = 205 (80.70%); both public & private: *n* = 41 (16.1%)
47	Strey et al. (2022) [31]	37.6 ± 10.4 years (range 22–66 years)	79.7%	14.2 ± 10.4 years (1–42 years). Public system experience: 9.2 ± 8.2 years	Dentists	NR	NR	Public: 100%
48	Taheri et al. (2018) [70]	36.8 years (range 25–60 years)	*n* = 80 (52%)	Mean: 9.88 (1–35 years)	GDPs	NR	NR	Private: 100%
49	Tami-Maury et al. (2016) [71]	51–65 years: 62%	32%	NR	Dentists	NR	NR	NR
50	Vijay Kumar & Suresan (2012) [72]	20–39 years: 30%; 40–59 years: 62%; 60 & above: 8%	45%	NR	Private dentists. Postgraduate qualification: 24%	NR	NR	Private: 100%. Solo: 44%; partnership: 25%; employee/ contractor: 24%; others: 7%
51	Wong & Toljanic (2009) [20]	NR	NR	NR	Maxillofacial dentists	NR	NR	NR
52	Wright et al. (2011) [22]	NR	NR	NR	Managers of dentists	NR	NR	Public: *n* = 83 (100%). 100% Salaried dentists
53	Yellowitz et al. (1998) [51]	NR	11%	Range from 1–30 years	GDPs	53% attended OC CE within the past 5 years	NR	Solo practitioners: 68%

CE Continuing education, *DH* Dental hygienist, *GDP* General dental practitioner, *NR* Not reported, *OC* Oral cancer, *SD* Specialist dentist

were aware of its significance. Among the 18 studies investigating older age, 11 studies reported > 60% of participants correctly identified older age as a risk factor [39, 40, 45–49, 52, 60, 69, 70]. Of the 16 studies that explored Human Papilloma Virus (HPV), 9 out of 15 reported that > 60% of participants were aware of the association between HPV and OC [32, 34, 43, 45–47, 49, 50, 69], although a focus group study revealed that dentists had limited knowledge [23]. In contrast, of the 10 studies investigating consumption of fruit/ vegetables, 8 studies reported < 50% of participants identified low consumption as a risk factor [32, 39–41, 44, 47, 49, 69].

CTx side effects and management

In two studies that assessed dentists' knowledge of H&N radiation therapy (RT) and side effects, > 80% of dentists were able to identify radiation-related caries as an oral complication following RT [54, 61]. Dentists working in the field of H&N RT were more aware of radiation related complications than dentists not working in the clinical area [61].

Perceptions

Twenty-one studies surveyed dentists' perception of their cancer knowledge, 5 studies assessed dentists' perceived role in cancer management, 14 studies investigated dentists' role in OC screening, and 33 studies examined the adequacy and interest in further cancer training (see supplementary file 3 in the Appendix).

Perceived knowledge

In studies investigating dentists' perception of cancer knowledge, knowledge was categorised into perceived (i) currency and (ii) sufficiency. On average, 56.9% dentists (*n* = 13) perceived their OC knowledge was current [32, 39, 40, 44, 46, 47, 51, 52, 60, 62, 63, 66, 72]. However, 35.3% of dentists (*n* = 3) found their OC knowledge was sufficient [37, 50, 58]. Furthermore, an average of 60.4% of dentists (*n* = 3) perceived their OC prevention knowledge was sufficient [32, 43, 50]. Two studies found there was no correlation between perceived and actual knowledge [51, 59], while other studies reported a positive correlation [49, 50]. Additionally, 2 studies investigated dentists' perceived cancer management knowledge, with

one study reporting 37.1% of dentists felt their knowledge was current [53] and the other study found dentists with more experience were more likely to treat CPs [24].

Perceived role of dentists in managing CPs

Two studies reported > 75% of participants agreed that GDPs should provide dental treatment for OC patients [24, 53]. However, dentists' willingness to provide dental treatment to H&N CPs receiving RT varied; < 50% of dentists expressed comfort in managing these patients [57], and the preference to refer these patients to dentists who specialised in the field ranged from 32.9% [53] to 77.1% [61]. A study exploring dentists' perceived roles in treating patients with a history of cancer, found that 91% of GDPs were happy to provide dental treatment to cancer survivors [71].

Perceived role of dentists in cancer screening

On average, 88.3% of dentists ($n=7$) acknowledged the role of dentists in OC screening [25, 28, 48, 50, 55, 60, 69]. However, some dentists believed that oral screening should be performed selectively, with an average of 71.6% of dentists ($n=5$) perceiving dentists have a role in performing OC screening in high-risk patients [34, 36, 51, 60, 72], and in one study 78% of dentists indicated a role in screening patients with a history of HNC [34].

Perceived adequacy of training

On average, 63.6% of dentists ($n=4$) perceived their OC training was sufficient [31, 35, 47, 56], 59.6% of dentists ($n=17$) perceived their OC screening practice was sufficient [25, 27, 32, 41, 43, 46, 49, 51, 52, 56, 60, 62, 63, 66, 69, 72, 73], while 47% of dentists ($n=4$) perceived they were adequately trained to treat CPs [21, 24, 53, 65]. With regards to further training needs, studies consistently reported a strong inclination among dentists for further training. On average, 87% of dentists ($n=2$) were interested in receiving OC CE [41, 43], 81.7%% dentists ($n=11$) were interested in specific training on OC detection [32, 35, 39, 40, 45, 50, 52, 62, 63, 67, 73], and 92.5% of dentists ($n=2$) were interested in training on managing CPs [53, 57].

Practice

Studies that surveyed practice of dentists can be grouped in oral screening practice ($n=33$), management of suspicious oral lesions ($n=13$), managing CPs ($n=14$) and communication with other health professionals ($n=7$) (see supplementary file 4 in the Appendix).

Oral screening practice

In clinical practice, an average of 53.4% of dentists ($n=16$) reportedly performed oral screening examinations on every patient [25, 28, 29, 32, 34, 37, 41, 48, 49, 51, 52, 55, 58, 63, 69, 72], while 71.8% of dentists ($n=9$) selectively screened high risk patients [26, 35, 43, 44, 50–52, 56, 69]. Recent graduates ($n=2$) [35, 50] or dentists who perceived to have adequate training ($n=3$) [50, 60, 66] were more likely to perform OC examinations on their patients.

Management of suspicious oral lesions

Majority of dentists refer suspicious lesions to a SD to confirm diagnosis. Only 36.7% of GDPs ($n=4$) performed the biopsy on patients with suspicious oral lesions [27, 43, 46, 72].

Management of CPs

Of the studies that explored SDs ($n=4$), over 60% of restorative specialists [38, 42] and over 78% of oral maxillofacial surgeons [64] managed H&N CPs in their clinical practice. In one study, 55% of oral maxillofacial surgeons reportedly reviewed leukaemia patients pre-chemotherapy [20]. However, among studies of GDPs ($n=6$), 4 studies found > 50% of dentists saw CPs undergoing CTx [21, 22, 53, 57, 65] although one study reported GDPs rarely see CPs [73]. Location of practice (metropolitan or urban) [53], gender, age and duration of practice [54] reportedly was not associated with dentists seeing CPs. However, a study suggests place of graduation influenced if a GDP would refer patients with HNCs to a SD for dental management [24].

Communication with other health professionals

Amongst the studies with GDPs ($n=3$), majority of dentists who treated CPs communicated with the oncology team [21, 53], however they rarely received updates from the oncology team [21]. A study reported that 88.5% GDPs reported that having a referral guideline could improve the quality of referrals [32]. Amongst the studies of restorative specialists ($n=2$), 52% attended multi-disciplinary meetings (MDTs) [38] and most patients seen at oncology assessment clinics were referred from MDTs [42]. A study on dentists in management roles found that 13% of dental managers believed dental service for CPs can be improved by having earlier referral for dental care [22].

Confidence

Three studies explored dentists' beliefs in their capabilities in managing CPs. In two studies, < 50% felt confident in treating HNC patients [24, 53]. One study reported that GDPs were most comfortable with performing non-invasive or less complex procedures on CPs [57].

Barriers and facilitators

Content analysis of free text responses or qualitative data within studies reporting barriers and facilitators to

providing oral care to CPs, identified professional, organisational and patients' factors that influence dentists' willingness to provide dental care to CPs.

Professional barriers and facilitators

Lack of training [37], knowledge and skills [21, 65] were identified in 3 studies as a barrier to providing dental treatment for patients undergoing CTx. The increased time required to manage oral health of CPs [38] and the short timelines to perform dental screening between diagnosis and commencement of CTx [21, 38, 65] were also highlighted as barriers.

The complexity and consideration of CTx needed before performing dental treatment could pose as barrier for dentists to treat CPs [42]. For example, a survey of dentists managing CPs with bone modifying agents found that 94% of dentists considered risk of extracting a tooth (osteoradionecrosis), 81% of dentists considered the prognosis of the tooth (extension of caries) and 76% of dentists considered success of conservative management (restorability of tooth) in their dental treatment planning for patients undergoing RT [42].

Organisational barriers and facilitators

Structural barriers also impact on dentists' ability to provide dental care to patients. Studies ($n=2$) highlighted that the medical team does not prioritise or refer patients for dental screening prior to treatment or provide information to patients [21, 65]. One study reported the need for inclusion of oral health and referral pathways in the overall care plan of CPs [65]. The short time frame between diagnosis and treatment commencing also restricts time available for screening [38]. Similarly, dentists lack of clear guidance on safe treatment options [65]. Having referral sources and a policy to provide long-term continuing care for patients following completion of CTx was highlighted as a potential facilitator to the continuity of care for patients [22].

Lack of communication between dentists and the cancer team was also a barrier to care. For example, in one study, 31% of dentists reported a lack of correspondence with the patient's oncology team [21] and other studies ($n=2$) reported weak links with oncology services and primary care providers impacted on timely communication [22, 65].

Funding models were also highlighted as a barrier to dental care for many. For example, in two US studies it was reported 1/5 of dental practices did not accept CPs on Medicaid [21, 65] and insurers do not provide cover for dental treatment ($n=2$) as it is not viewed as necessary for cancer management [20, 65]. UK managers also highlighted need for specific funding for dental treatment of CPs [22].

Patients' barriers and facilitators

Patients' lack of awareness can also be a barrier to accessing care. For example, in one study 56% of dentists reported a lack of patient education on oral complications [21] and a second study reported inadequate patient education of oral risks associated with RT [65].

Quality of studies

Overall, most studies ($n=43$) scored over 71% on MMAT. The quality assessment can be found in supplementary file 5. No studies were excluded from the review based on their quality assessment. The review did identify a high risk potential bias in one paper included in our analysis [64]. This risk is related to lack of details about how recruitment processes were conducted. Given we used a narrative synthesis to summarise study results in this review, it is unlikely inclusion of this study resulted in mis-representation or inflation of the review findings. Fifty-one of the 53 studies were surveys, it is worth noting that these survey-based studies have their limitations including self-selecting samples, small sample size and low response rate which increased the risk of selection bias. Further, most studies adopted study specific questionnaires due to a lack of standardization in outcome measures. Hence, this review is classified as level V primarily relying on descriptive and qualitative research.

Discussion

This is the first systematic review that synthesizes the perspective of dentists in managing CPs. In our review, 94% ($n=50$) of studies limited their focus to HNC. This is despite all CPs potentially experiencing short and long-term treatment related oral complications.

It is well known that having clinical guidelines alone are not sufficient to change practice; rather multi-level factors are required to implement evidence-based research into clinical practice [74]. In this review we sought to map the current literature to the Theoretical Domains Framework [75], to provide a conceptually robust exploration of factors that may influence clinical practice change among dentists. We specifically focused on the domains of knowledge, skills, professional role and identity, beliefs about capabilities, and environmental context and resources.

The review found that there is great variability in dentists' OC knowledge. This is likely to due to a lack of standardised measure and variation in how knowledge was assessed. Across studies, while there was a high percentage of respondents who were able to identify alcohol and tobacco are associated with OC, they showed less awareness of other risk factors and myths. Not surprisingly, higher cancer knowledge was linked to clinical exposure, prior cancer education and positive perception of cancer training. Regardless of their current knowledge

or perception, dentists expressed desire in further CE in deepening their cancer knowledge, OC detection and CTx.

Our review found that while dentists view their responsibilities as including OC screening and management, however, fewer conduct screening in their clinical practice. This pattern is also observed in managing patients with OC, possibly due to insufficient oncology training in dentistry programs. There is limited information on dentists' perceptions of their role in non-HNC management. With evolving CTx and side effects such as opportunistic infection [76], dental caries, gingivitis and febrile episodes from odontogenic origin [77], the need for managing patients with non-HNCs is becoming crucial.

In our review, GDPs reported lower proficiency in giving advice to CPs [24, 53] and were reportedly less comfortable performing complex dental procedures for such patients [57], in comparison to SDs [38, 42, 64]. However, after implementation of education programs in Texas [78, 79], there was a notable change, with majority (91%) of GDPs in recent local survey providing dental treatment to patients undergoing CTx or with a history of cancer [71]. This highlights the benefits of cancer-specific training.

Our review found where dental treatment is dictated by third parties (such as insurance companies or government agencies), dental care in patients with non-HNCs was not deemed as a necessity. Previous research also found 56% of cancer centres did not have a dental department [11]. This is despite research demonstrating a 26% reduction of oral complications following implementation of dental services to patients with non-HNCs [3]. Furthermore, research demonstrated that dental intervention reduced blood stream infection in patients following allogenic HSCT [80], decreased incidence of osteonecrosis in patients with bone metastases treated with bisphosphonates [81], and lowered risk of mucositis in breast CPs undergoing chemotherapy [82].

Dentists working in the community have an important role in cancer care. A hospital-based dental intervention demonstrated positive outcomes in reducing adverse oral side effects in patients with HSCT, however there was a 86% drop-out rate at the 3-month follow-up due to the distance patients were required to travel to the hospital [2]. This highlights the need for accessible dental care closer to patients' home, ensuring continuity of care and leveraging existing rapport with their dentists during cancer treatment. Our review found that 92.5% of dentists were willing to receive further training on managing CPs. This affirms Fantozzi et al. [16] view that adequately trained dentists working in the community are critical to providing safe and effective oral care for CPs.

A limitation of this study is that most literature focused on HNCs, resulting in over-representation of HNCs. Given this study is on patients with all forms of cancer, it might not reflect dentists' perspective on managing CPs more broadly. Secondly, a lack of standardised questionnaires in assessing outcomes across studies could leading to challenges in drawing consensus results. Furthermore, utilising study-specific and non-validated questionnaires can lead to misinterpretation of the results. For example, Martins et al. [61] assumed "radiation-related caries leads to osteonecrosis" while in fact, it is the extraction of carious teeth in the irradiated bone rather than having caries that leads to osteonecrosis of the jaw. In another study [59], the authors introduced uncommon terminologies "initiating" and "promoting" factors for OC and pointed out participants could not differentiate between the two. This can result in potentially inaccurate data being collected. Lastly, no studies was excluded based on their quality or biases. Results were based on data reported by the studies.

Conclusion

This review highlights the paucity of research related to dentists' knowledge, perception, practice and confidence in treating CPs outside of H&N regions. There is a need for future studies to understand barriers that hinder dental involvement with oncology patients and to identify strategies to facilitate clinical practice amongst dentists to be in alignment with advancement in cancer treatments.

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-024-11676-8.

Supplementary Material 1.

Supplementary Material 2

Supplementary Material 3

Supplementary Material 4

Supplementary Material 5

Code availability

Not applicable

Authors' contributions

All authors (SL, AH and JS) were involved in conceptualising the review. SL carried out initial database searches. SL and JS screened initial results and articles that met inclusion criteria. Any disagreements were resolved with AH. All authors contributed to quality review of a subset of included reviews. SL wrote the first draft of the manuscript. JS and AH made contributions to subsequent drafts. All authors read and approved the final manuscript.

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Availability of data and materials

These are submitted as supplementary files.

Declarations

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