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Oral Health Care: A Systematic Review of Clinical Practice Guidelines

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ABSTRACT

Maintaining good oral hygiene is essential for preventing and managing oral health problems. This systematic review aimed to identify and assess clinical practice guidelines on oral hygiene, focusing on quality and key areas. A comprehensive search was conducted in PubMed, CINAHL, Scopus, Cochrane, and organizational websites. Guidelines from health organizations that focused on oral health, hygiene education, and disease prevention were included. Guidelines based on expert opinions and those focusing on specific pathologies were excluded. The AGREE II tool was used to evaluate quality, and a narrative synthesis summarized recommendations across pediatric, adult, and senior age groups. Nine studies were reviewed. Results showed that electric toothbrushes do not significantly outperform manual ones in preventing cavities, though they may reduce plaque. Fluoride toothpaste is less effective if followed by rinsing with water. For adults, mouthwashes with chlorhexidine or sodium fluoride are recommended. Checkups every six months are advised for healthy children and adults. Proper denture care is also emphasized. Regular updates to oral care guidelines are necessary, as oral health affects essential functions and social well-being.

1 | Introduction

Oral health activities involve evaluating and monitoring the oral cavity to prevent or eliminate oral diseases and conditions. These activities include brushing teeth, cleaning dentures, using mouthwash, engaging in interdental cleaning, and moisturizing oral tissues (Registered Nurses' Association Ontario [RNAO] 2020). Maintaining oral health is crucial for overall well-being, facilitating proper nutrient intake, and promoting clear communication (Glick et al. 2016).

Researchers have long explored the relationship between oral and overall health, linking various health conditions such as cardiovascular diseases, high blood pressure, stroke, diabetes, dementia, respiratory diseases, and mortality to periodontal diseases through inflammatory pathways (Sabbah, Folayan, and El Tantawi 2019; World Health Organization [WHO] 2024). Diet, nutrition, and oral health in older adults with malnutrition are closely connected, as highlighted by Chan et al. (2023). The World Health Organization and the American Dental Association emphasize the bidirectional relationship between these factors, which exacerbate each other, increasing the risk of disease and mortality. Integrating oral health into elderly care is crucial to promote healthy aging (Chan et al. 2023).

Oral health has unique characteristics across adult age groups. For infants up to six months old, establishing healthy oral habits is crucial in preventing tooth decay. After each feeding, cleaning

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Summary

- Maintaining good oral hygiene at any age is crucial for preventing oral health issues, significantly affecting vital functions, psychological well-being, and social interaction.
- Despite its critical importance, ensuring good oral care is often overlooked in nursing practice, highlighting a persistent challenge.
- Promoting practical oral care includes educating patients on age-specific practices, leveraging technology, and addressing socioeconomic barriers through community outreach, which is essential for comprehensive healthcare delivery.

the gums with a moistened washcloth wrapped around the index finger is recommended, and colostrum-based mouth care can help prevent infections. This practice is especially beneficial for newborns, particularly preterm infants, whose oral reflexes are still developing (EFCNI et al. 2018; Centers for Disease Control and Prevention 2024). Cavities, also known as caries or tooth decay, are the most common chronic illness among children in the United States. Over 50% of children aged 6 to 8 have had cavities in at least one of their primary teeth. Likewise, more than 50% of teenagers aged 12 to 19 have experienced cavities in at least one of their permanent teeth. Untreated cavities can lead to pain and infections, potentially causing issues with eating, speaking, playing, and learning (Centers for Disease Control and Prevention 2024).

In young adults (20–39 years), craniofacial and tooth development is typically complete by age 20, resulting in 32 permanent teeth unless congenital issues exist. Dental caries is common in this age group, and preventive care is crucial (National Institute of Dental and Craniofacial Research 2021). Early signs of periodontal disease may also emerge, underscoring the importance of good oral hygiene and regular dental checkups. Middle-aged adults continue to face risks of dental caries, often due to lifestyle factors. During this stage, periodontal disease becomes more pronounced and requires professional care to prevent tooth loss (National Institute of Dental and Craniofacial Research 2021). Partial tooth loss, more common among individuals with socioeconomic disparities, increases in prevalence. As the population ages and retains more of its natural teeth with fewer cases of edentulism, there is a growing need for older adults to receive regular dental care and preventive services (Dye, Weatherspoon, and Lopez Mitnik 2019).

According to the literature, untreated caries in deciduous teeth peak at age 5 and in permanent teeth between the ages of 20 and 24. Seniors over 65 years old have an average of 18.9 remaining teeth, with severe periodontitis most commonly peaking between 60 and 64, and complete tooth loss increasing significantly between the ages of 85 and 89. No documented gender differences in oral health have been reported (GBD 2017 Oral Disorders Collaborators 2020; National Institute of Dental and Craniofacial Research 2018). However, specific populations, such as those with a history of tobacco use or HPV infection, face increased risks of oral and oropharyngeal cancers, making regular screenings crucial. Notably, oral cancer is the 13th most common malignancy worldwide (WHO 2023). Although extensive research has been conducted on maintaining proper oral health and hygiene concerning specific diseases, addressing these concerns within the general population, particularly focusing on the distinct characteristics of different age groups, is crucial.

While the connection between oral health and overall health remains unclear, shared risk factors may likely contribute to comorbidities (Sabbah, Folayan, and El Tantawi 2019). Peres et al. (2019) found a direct link between socioeconomic status and oral health issues; hence, addressing common risk factors could alleviate the burden of oral diseases. These initiatives should focus on promoting a balanced diet with fewer sweets and more fruits and vegetables, drinking water as the primary beverage, limiting tobacco use, reducing alcohol consumption, and wearing protective devices during sports, cycling, or motorcycle riding to minimize facial injury risks (WHO 2023).

Referring to the oral cavity leads to the concept of fundamental care, which addresses the essential needs of the individual. Fundamental care refers to the actions and behaviors of nursing staff that prioritize patients' essential needs for physical and psychosocial well-being (Feo, Kitson, and Conroy 2018). Missed nursing care (MNC), an omission error, can result in adverse events, lower care quality perceptions, and reduced patient satisfaction. Additionally, it can increase readmission rates, negatively impact job satisfaction, and lead to more nurses leaving the profession (Smith et al. 2018). In numerous studies on MNC, oral care has consistently emerged as one of the most overlooked areas (Kalisch et al. 2011; Cho et al. 2015; Griffiths et al. 2018; Chaboyer et al. 2021).

Systematic, high-quality research is crucial for supporting fundamental care and guiding clinical practice and educational development (Kitson et al. 2019). Clinical practice guidelines (CPGs) are key in assisting healthcare professionals in making evidence-based decisions tailored to individual and clinical contexts, which helps enhance overall well-being (Johnston et al. 2019). The use of systematic reviews of CPGs has grown, offering comprehensive insights into clinical recommendations. These reviews aimed to unify healthcare approaches and foster collaboration, supporting the dissemination of best practices, particularly in oral health (Korhonen et al. 2013).

Despite the continual refinement of the rigor of guideline development, persistent challenges impede the comprehensive integration of CPGs into clinical practices, such as the scarcity of pertinent evidence, lapses in guideline currency, and a lack of proactive strategies to overcome obstacles to the successful implementation of guidelines in different clinical settings (Frantsve-Hawley et al. 2022).

The objective of this review is to identify and critically appraise CPGs concerning oral health and hygiene. Specifically, this review aimed to investigate the domains of oral health and hygiene most often reported and examine how these CPGs address the general population across different age groups. The research questions posed are 1) What are the CPGs related to oral health and hygiene? 2) What is the quality level of the identified CPGs? 3) Which domains of oral health and hygiene are most frequently

reported? 4) How do these guidelines address the general population across different age groups?

2 | Methods

2.1 | Design

A systematic review of CPGs was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al. 2021). The study protocol was registered in the international PROSPERO (International Prospective Register of Systematic Reviews) database with the ID protocol CRD42022310247 on 22 March 2022.

2.2 | Search Strategy

The following databases were searched in November 2021: PubMed/MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, and Cochrane Library (used for comparison and consultation). Additionally, a manual search of the websites of various scientific organizations, societies, and institutions was conducted. An online search was also conducted for key entities producing CPGs, including the National Institute for Health and Clinical Excellence (NICE), Canadian Task Force on the Periodic Health Examination, Community Guide USA Preventive Task Force (CPSTF), US Agency for Healthcare Research and Quality, Scottish Intercollegiate Guideline Network (SIGN), Oxford Centre for Evidence-Based Medicine (CEBM), Registered Nurses' Association of Ontario (RNAO), and the Italian Ministero della Salute (Table 1).

2.3 | Selection Criteria

The inclusion criteria were as follows: CPGs published by professional health associations, government health agencies, or international health organizations; publications in English, Italian, Spanish, French, Portuguese, or German related to recommendations for oral hygiene, oral care prevention, and education; CPGs targeting the general population without specific pathologies (from pediatric to elderly age). The exclusion criteria involved the removal of CPGs based solely on expert opinions and those authored by a single individual, as these were considered to have lower methodological quality (Brouwers et al. 2010). Moreover, studies other than CPGs and CPGs focused on specific pathologies were excluded in accordance with the aims of the review.

The PubMed/MEDLINE, CINAHL, Scopus, and Cochrane Library databases were searched according to the keyword inclusion criteria outlined in Table 1. Guidelines derived from the consulted scientific organizations and entities were screened to assess whether the guidelines of interest were available on their websites. Two authors independently conducted the selection process, and any discrepancies were resolved through a consensus discussion involving a third author to harmonize varying perspectives during evaluation.

2.4 | Types of Participants

CPGs are designed for the general population, excluding individuals with specific pathologies. These guidelines cover children aged 0–19 years, adults from 19 to 65 years, and the elderly aged 65 years and older. The subgroups within these age ranges allowed for a thorough examination of areas of interest, aiming to highlight the aspects most emphasized in the literature for different populations. Additionally, the treatments recommended in these guidelines vary based on the specific characteristics of deciduous and permanent teeth.

2.5 | Data Collection and Analysis

Two authors independently extracted data from the retrieved documents using a standardized template in Microsoft Excel (Microsoft Corporation 2024, Microsoft Excel: version 16.85). The data extraction focused on the CPG provider organization, the type of population addressed (including children, adolescents, adults, and older people), the domains investigated, and the principal findings of each guideline.

The domains included comparisons between manual and electric toothbrushes, toothpaste composition, use of oral rinses, and recommendations related to medical visits and checkups. The category of "other indications" encompassed additional recommendations or considerations not covered by the investigated domains, such as dietary and lifestyle influences on oral health, the use of flossing devices, proper care of dentures, and specific preventive measures. In cases where discrepancies arose during the data extraction process, a third collaborator was involved to ensure accuracy and resolve conflicts. The conclusions presented are based on data collected from January 2001 to November 2021, offering a comprehensive overview of guidelines within this period. The 20-year timeframe was selected to include both earlier and recent developments, allowing for the examination of long-term trends and shifts in practice influenced by advancements in research and technology. This period aligns with the broader adoption of evidence-based CPGs, which gained significant momentum in the early 2000s as healthcare systems emphasized structured, research-supported recommendations (Atkins et al. 2004).

2.6 | Management of Missing Data

When inconsistencies were identified or additional information was required for the selected studies, contact was established via email with the corresponding authors of those studies. Ultimately, it was impossible to obtain relevant data or information for the accuracy and truthfulness of the review.

2.7 | Critical Appraisal

Three independent reviewers critically evaluated the risk of bias in the selected studies using the English version of the Appraisal of Guidelines for Research and Evaluation (AGREE II) tool (Brouwers et al. 2010). The AGREE II assesses the methodological rigor and transparency of CPGs and comprises

TABLE 1 | Search strategy.

Database	Research strings
PubMed/MEDLINE	((“adult” (MeSH Terms) OR “adult” (Text Word) OR “grown” (Text Word) OR “middle aged” (Text Word) OR “adults” (Text Word) OR “grown-up”(Text Word)) AND (“Guidelines as topic” (MeSH Terms) OR “practice guideline” (Text Word) OR “recommendation” (Text Word) OR “clinical practice guideline” (Text Word) OR “guidelines” (Text Word)) AND (“oral health” (MeSH Terms) OR “dentistry” (Text Word) OR “oral hygiene” (MeSH Terms) OR “oral care” (Text Word) OR “oral hygiene” (Text Word) OR “oral health” (Text Word) OR “mouth hygiene” (Text Word) OR “dental health” (Text Word) OR “mouth care” (Text Word))) Filters: Guideline, from 2001/1/1–2021/12/31
	((“child” (MeSH Terms) OR “infant” (MeSH Terms) OR “child” (Text Word) OR “youth” (Text Word) OR “infant” (Text Word) OR “children” (Text Word) OR “teenager” (Text Word) OR “kid” (Text Word)) AND (“Guidelines as topic” (MeSH Terms) OR “practice guideline” (Text Word) OR “recommendation” (Text Word) OR “clinical practice guideline” (Text Word) OR “guidelines” (Text Word)) AND (“oral health” (MeSH Terms) OR “oral hygiene”(MeSH Terms) OR “oral care” (Text Word) OR “dentistry” (Text Word) OR “oral hygiene” (Text Word) OR “oral health” (Text Word) OR “mouth hygiene” (Text Word) OR “dental health” (Text Word) OR “mouth care” (Text Word))) Filters: Guideline, from 2001/1/1–2021/12/31
	((“aged” (MeSH Terms) OR “aged” (Text Word) OR “geriatric” (Text Word) OR “old people” (Text Word) OR “senior” (Text Word) OR “elder*” (Text Word)) AND (“Guidelines as topic” (MeSH Terms) OR “practice guideline” (Text Word) OR “recommendation” (Text Word) OR “clinical practice guideline” (Text Word) OR “guidelines” (Text Word)) AND (“oral health” (MeSH Terms) OR “oral hygiene” (MeSH Terms) OR “dental health” (Text Word) OR “dentistry” (Text Word) OR “oral care” (Text Word) OR “oral hygiene” (Text Word) OR “oral health” (Text Word) OR “mouth hygiene” (Text Word) OR “mouth care” (Text Word))) Filters: Guideline, from 2001/1/1–2021/12/31
CINAHL	(adults or adult or middle aged) AND (practice guidelines or evidence based practice guidelines or clinical practice guidelines) AND (oral health or oral hygiene or dental health or dental care or oral care) Publication Date: 20010101–20 221 231(children or kids or youth or child) AND (practice guidelines or evidence based practice guidelines or clinical practice guidelines) AND (oral health or oral hygiene or dental health or dental care or oral care) Publication Date: 20010101–20 221 231(elderly or aged or older or elder or geriatric or elderly people or old people or old people or senior) AND (practice guidelines or evidence based practice guidelines or clinical practice guidelines) AND (oral health or oral hygiene or dental health or dental care or oral care) Publication Date: 20010101–20 221 231
Scopus	(*”adult”* OR *“grown”* OR *“middle aged”* OR *“adults”* OR *“grown-up”* AND *“Guideline”* OR *“Clinical practice guidelines”* AND *“oral health”* OR *“oral hygiene”* OR *“oral care”* OR *“oral hygiene”* OR *“oral health”* OR *“dental health”* OR *“mouth care”*) AND PUBYEAR >*2000* AND PUBYEAR <*2022* AND (LIMIT-TO(DOCTYPE, *“re”*)) AND (LIMIT-TO(SUBJAREA, *“MEDI”*) OR LIMIT-TO(SUBJAREA, *“DENT”*) OR LIMIT-TO(SUBJAREA, *“NURS”*))
	(*”kids”* OR *“children”* OR *“child”* OR *“infant”* OR *“kid”* OR *“infants”* AND *“Guideline”* OR *“Clinical practice guidelines”* AND *“oral health”* OR *“oral hygiene”* OR *“oral care”* OR *“oral hygiene”* OR *“oral health”* OR *“dental health”* OR *“mouth care”*) AND PUBYEAR >*2000* AND PUBYEAR <*2022* AND (LIMIT-TO(DOCTYPE, *“re”*)) AND (LIMIT-TO(SUBJAREA, *“MEDI”*) OR LIMIT-TO(SUBJAREA, *“DENT”*) OR LIMIT-TO(SUBJAREA, *“NURS”*))
	(*”elderly”* OR *“elder”* OR *“geriatric”* OR *“aged”* OR *“senior”* OR *“old people”* AND *“Guideline”* OR *“Clinical practice guidelines”* AND *“oral health”* OR *“oral hygiene”* OR *“oral care”* OR *“oral hygiene”* OR *“oral health”* OR *“dental health”* OR *“mouth care”*) AND PUBYEAR >*2000* AND PUBYEAR <*2022* AND (LIMIT-TO(DOCTYPE, *“re”*)) AND (LIMIT-TO(SUBJAREA, *“MEDI”*) OR LIMIT-TO(SUBJAREA, *“DENT”*) OR LIMIT-TO(SUBJAREA, *“NURS”*))
Cochrane	((adult OR middle-aged OR grown-up) AND guidelines AND (oral care OR oral hygiene)) Filters: from 1/01/2001 to 31/12/2021
	((children OR kids OR infants) AND guidelines AND (oral care OR oral hygiene)) Filters: from 1/01/2001 to 31/12/2021
	((elderly OR aged OR geriatric) AND guidelines AND (oral care OR oral hygiene)) Filters: from 1/01/2001 to 31/12/2021
	Dentistry & oral health in Cochrane Topic Filters: from 1/01/2001 to 31/12/2021

23 items organized into six domains of quality. A quality score was calculated for each domain following the calculation method outlined in the "AGREE II Instrument" document (Brouwers et al. 2010).

Domain scores can be used to identify the strengths and limitations of guidelines, compare methodological quality, and select high-quality documents for implementation. Currently, there is insufficient empirical data linking specific quality scores to implementation outcomes or specific clinical results. According to AGREE II, the Consortium has not defined minimum domain scores or specific score patterns across domains to differentiate between high- and low-quality guidelines. Rather, users are advised to make such distinctions based on their discretion and the context in which AGREE II is employed. Considering the lack of specific guidelines, the authors chose to apply a discretionary cutoff of 60%, deeming it a sufficient level of quality. If any documents had been found with scores below this threshold, they would have been carefully evaluated for potential inclusion. According to the recommendation of Andrade et al. 2020, any domain or overall scores below the 50% threshold are typically considered indicative of low quality.

2.8 | Synthesis of Guideline Recommendations

A narrative synthesis of the included CPGs was conducted to provide an overview of recommendations for proper oral hygiene, oral disease prevention, and the main domains identified by the documents for the following age groups of the healthy population: pediatric patients aged 0–19 years, adults aged 19–65 years, and seniors aged 65 years and older.

The pediatric patient category includes infants, children, and adolescents. The synthesis highlights guidelines for early oral health interventions, preventive measures such as fluoride use, and recommendations for managing common pediatric oral conditions. For adults aged 19–65 years, the synthesis focuses on maintaining oral health through routine care, preventing periodontal disease, and managing common issues such as cavities and gingivitis. It includes guidelines on lifestyle factors that affect oral health, such as diet and smoking cessation, as well as recommendations for regular dental checkups. The section for seniors aged 65 years and older emphasizes guidelines tailored to the oral health challenges associated with aging, such as dry mouth, tooth loss, and the need for regular oral screenings. It also covers preventive measures specific to older people, including denture care and management of age-related oral conditions.

By categorizing the recommendations in this manner, the narrative synthesis aims to provide targeted insights into the practices and preventive measures most relevant for each age group, ensuring that the guidelines address the distinct needs of pediatric, adult, and senior populations.

3 | Results

A comprehensive search across databases yielded 906 articles, including 82 from Cochrane, 103 from PubMed, 388 from CINAHL, and 333 from Scopus. Further exploration through manual searches of the websites of scientific organizations, societies, institutes, and key agencies involved in CPGs resulted in the identification of nine additional publications, bringing the initial count to 915.

After removing irrelevant and duplicate articles, the final dataset comprised 204 articles. Subsequent abstract evaluation led to the exclusion of 152 unrelated and duplicate reports. Finally, nine publications met the inclusion criteria and are represented in the PRISMA 2020 flow diagram. This diagram also includes searches conducted on registries and other sources (Page et al. 2021) (Figure 1).

Our findings began with stratification based on age groups, recognizing variations in indications across different life stages. Subsequently, the results delineated common domains of interest, including aspects such as manual or electric brushing, additional fluoride in toothpaste, mouth rinses, brushing practices for the oral mucosa and tongue, and considerations for medical visits and expert checkups. The domains were identified by assessing the most prevalent areas across the different age groups outlined in the guidelines. These domains represent frequently discussed topics and can be consolidated into specific areas of interest. Specifically, the domains include comparisons between manual and electric toothbrushes, toothpaste composition, oral rinses, medical visits, checkups, and other indications. These topics are relevant across all age groups examined—children, adults, and older people—highlighting their cross-sectional importance in dental care practices (Table 2). The CPGs included in the study were assessed to be of good quality according to AGREE II, with scores exceeding 70% (Table 3). No study in the analysis had a quality below this value.

3.1 | Children (Pediatric Patients Aged 0–19 Years)

From the analysis of the identified CPGs, three were found to be relevant to the target population. Two documents were broadly directed toward oral health and care in minors aged 0–19 years (SIGN 2014; National Institute for Health and Care Excellence [NICE] 2016b), whereas one specifically addressed adolescents (American Academy of Pediatric Dentistry [AAPD] 2020). The quality of the included studies was high, as indicated by the AGREE II assessment (Table 3).

3.1.1 | Manual vs. Electric Toothbrushes

No evidence suggests that electric toothbrushes are more effective than manual toothbrushes in preventing dental caries in children. However, short-term studies (≤ 3 months) have shown that brushing teeth with a rotating-oscillating electric toothbrush allows for the removal of more plaque (11%) and significantly reduces gum bleeding (6%) compared with brushing with a manual toothbrush. In long-term studies (> 3 months), gingival bleeding was reduced by 17%. The only type of electric toothbrush that appears to be superior to the manual toothbrush in plaque removal and reducing gum bleeding in children is one equipped with a rotating-oscillating mechanism (SIGN 2014). These guidelines emphasize that it is the act of brushing itself that is crucial, demonstrating that younger children are

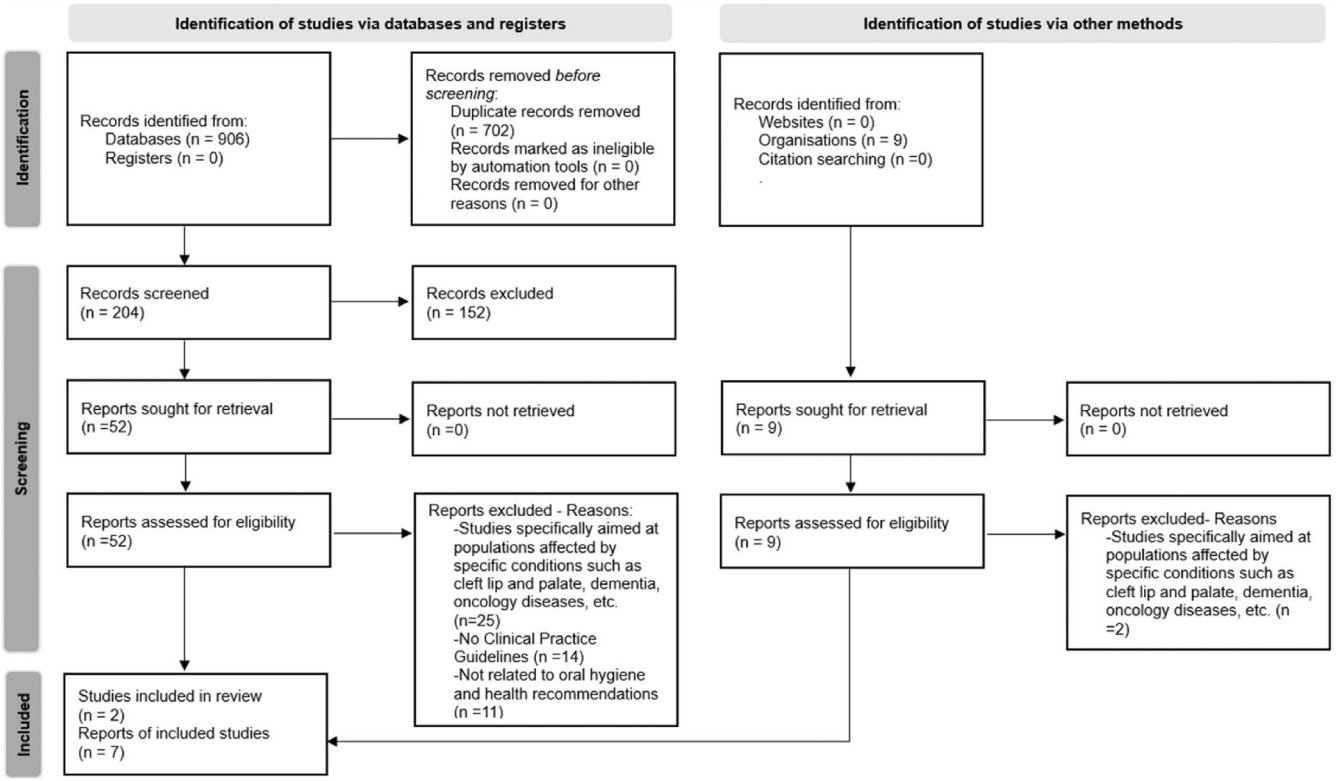

FIGURE 1 | PRISMA flow chart (Page et al. 2021).

at a lower risk of developing cavities when they begin brushing their teeth. Overall, 88% of children who began brushing their teeth in the first year of life did not develop cavities, compared to 81% of those who started brushing between the first and second years, and 66% of those who started after 2 years ($p < 0.01$) (SIGN 2014).

3.1.2 | Toothpaste Composition

Tooth brushing is beneficial for the mechanical removal of dental plaque. As stated in the *European Journal of Pediatric Dentistry*, when associated with the use of fluoride toothpaste, regular brushing twice daily represents the most powerful preventive measure against cavities (Campus et al. 2007). A Cochrane meta-analysis evaluated by the SIGN guidelines, comprising 70 studies (involving 42 300 children), observed a significant reduction in caries associated with the use of fluoride toothpaste compared to fluoride-free or no toothpaste (95% confidence interval [CI], 21–28–; $p < 0.0001$) (Marinho et al. 2003). However, to balance the benefits of preventing dental caries and the potential harm of fluorosis associated with excessive fluoride toothpaste ingestion, it is recommended that children under 3 years of age use no more than a smear of toothpaste, corresponding to approximately 0.1 mL of product. This would allow for 13 brushing episodes with 1000 ppm fluoride (ppmF) of toothpaste per day before exceeding the tolerable limit of fluoride intake if 100% of the toothpaste used is ingested. As for children above 3 years old, a pea-sized amount (approximately 0.25 mL of product) is recommended per brushing. This would allow for eight brushing episodes with 1000 ppmF toothpaste per day before exceeding the tolerable limit of fluoride intake (Campus et al. 2007; SIGN 2014).

Parents and caregivers must supervise and ensure proper toothbrushing techniques and use an appropriate amount of toothpaste in this age group (SIGN 2014). The benefits of fluoride extend to teenagers, helping them throughout adolescence and early adulthood. While systemic fluoride incorporation into the developing enamel is generally considered unnecessary after the age of 16 years, topical benefits can still be obtained by optimally drinking fluoridated water, applying professionally administered and prescribed compounds, and using fluoridated dentifrices. Brushing teeth twice daily with a fluoridated dentifrice is recommended to provide continuous topical benefits. According to the AAPD (2020), this practice is emphasized to maintain optimal oral health.

3.1.3 | Oral Rinses

The incidence of dental caries increases in those who reported rinsing with water after brushing compared with that in children who reported not rinsing after brushing ($p < 0.05$). Additional rinsing with water after brushing reduces the preventive effect of fluoride toothpaste against dental caries and should, therefore, be discouraged. Encouraging children to avoid rinsing their mouths with water after brushing can help maximize the protective benefits of fluoride toothpaste and reduce the risk of dental caries. Additionally, topical fluoride rinses, in the form of mouthwash, seem to have a clear preventive effect on dental caries in permanent teeth, especially in the absence of daily use of fluoride toothpaste. However, no significant differences

TABLE 2 | CPG synopsis.

		Domains						
Guideline	**Population**	**Electronic vs manual toothbrush**	**Toothpaste composition**	**Oral rinses**	**Lip moisturizer**	**Brushing oral mucosa and tongue scraping**	**Medical examinations and checkups with experts**	**Others**
SIGN Dental interventions to prevent caries in children (SIGN 2014).	Children	5.6 Age at the commencement of brushing. Children should be assisted to brush their teeth as soon as they erupt. 5.7 Toothbrushing practice (timing, rinsing, powered vs. manual replacement) No evidence was identified to show that powered toothbrushes are more effective than manual toothbrushes in preventing dental caries in children. Better electric toothbrush for plaque removal and to reduce gum bleeding	5.2 Use of fluoride toothpaste 5.3 Concentration of fluoride toothpaste reduces the development of new dental caries. This effect increases with increased concentration of fluoride and with increased baseline caries levels. 5.4 Composition of fluoride toothpaste Children up to the age of 18 years who are at standard risk of developing dental caries should be advised to use toothpastes in the range of 1000 to 1500 ppmF. No evidence investigating the harms of the different chemical compositions as caries-preventive agents. 5.5 Frequency and duration of brushing. Brush at least twice daily	5.7.1 Post-washing rinsing. Children should be encouraged to spit out excess toothpaste and not rinse with water after brushing. 7.7 Fluoride mouthwash. Clear preventive effect of topical fluoride, in the form of a mouthwash, on dental caries in permanent teeth in the absence of daily fluoride toothpaste use			2.1 Delivery of dental brief interventions in the practice setting. Oral health promotion interventions should facilitate daily toothbrushing with fluoride toothpaste. 4.3: Format of dental brief interventions. Oral health promotion interventions should be based on models such as motivational interviewing. 4.4: Social determinants of oral health. As part of the patient assessment, a social history should be taken. 9.2 Checklist for provision of information. Explain to the parent/carer that dental appointments should be encouraged from the age of 6 months	6.2 Dental floss. It is not possible to form a recommendation regarding the effectiveness of flossing or interdental brushes in addition to toothbrushing for reducing dental caries. 7.2 Topical chlorhexidine varnish. It is not possible to form a recommendation on the use of chlorhexidine varnish. 9.2 Checklist for provision of information. Ensure the child and parents/carer receive appropriate dietary advice, particularly in relation to the frequency of sugary food and drink consumption. 10.2 Resource implications of key recommendations. Fluoride varnish should be applied at least twice yearly. Resin-based fissure sealants should be applied to the permanent molars as early after eruption as possible

(Continues)

TABLE 2 | (Continued)

		Domains						
Guideline	**Population**	**Electronic vs manual toothbrush**	**Toothpaste composition**	**Oral rinses**	**Lip moisturizer**	**Brushing oral mucosa and tongue scraping**	**Medical examinations and checkups with experts**	**Others**
NICE Oral health for adults in care homes (NICE 2016a)	Elderly	1.3 Daily mouthcare. Use their choice of toothbrush, either manual or electric/ battery-powered	1.3 Daily mouthcare. Brushing natural teeth at least twice a day with fluoride toothpaste	1.3 Daily mouthcare. Daily use of any over-the-counter products preferred, such as particular mouth rinses			1.1 Carehome policies on oral health and providing residents with support to access dental services. Local general dental services and emergency or out-of-hours dental treatment; community dental services, including special care dentistry teams; oral health promotion or similar services	1.2 Oral health assessment and mouth care plans. If living in care homes, mark dentures. 1.3 Daily mouth care. Providing daily oral care for full or partial dentures (such as brushing, removing food debris, and removing dentures overnight)
RNAO Supporting Adults Who Require Assistance (RNAO 2020)	Adults/elderly	Appendix N: products and tools for oral care-manual vs. powered toothbrush. Statistically significant reduction of plaque and gingivitis with the use of powered toothbrush compared to manual. Persons who require assistance with oral care should be encouraged and supervised to brush their teeth at least twice a day	Appendix N: products and tools for oral care. The main nonprofessional intervention to prevent tooth decay is brushing teeth with fluoride toothpaste. There is a high certainty of evidence that toothpaste containing 1000–1250 ppm of fluoride is more beneficial at preventing tooth decay than toothpaste without fluoride	Appendix N: products and tools for oral care. Efficacy of oral rinses with:—Baking soda and saltwater—Cetylpyridinium chloride—Chlorhexidine—Essential oil compounds (e.g., Listerine) with or without alcohol—Fluoride mouth rinses—Povidone-iodin—Saltwater	Step-by-Step Instructions for Oral Care, including Tooth and Denture Brushing. The expert panel advised that, in addition to moisturizing the lips, it is also important to moisturize the oral cavity to avoid the buildup of membranous substances. Oral lubricants are used to alleviate discomfort, moisten the oral mucosa and lubricate oral tissue	Appendix N: products and tools for oral care. There is no evidence to suggest that using a tongue scraper to clean your tongue prevents bad breath. Elderly: Dry residues before tongue brushing to prevent discomfort. Educate on proper techniques, like relaxing the tongue and muscles, to avoid triggering vomiting reflexes	Background Context. Older adults may face challenges in oral care due to factors such as functional disability, reduced hand-eye coordination, and declining autonomy, which can lead to difficulties in accessing oral health professionals	Appendix M: Denture Care. Denture care involves using a soft-bristled brush to remove debris and stains, using a towel or dish to prevent breakage, avoiding abrasive cleaners, and not wearing dentures while sleeping. When not in use, soak them in water or cleaning solution and rinse with warm water. Consult a dental professional for adjustments or repairs, keep dentures away from children and pets, and avoid wrapping them in paper products. Seek dental advice if dentures become loose or cause irritation

(Continues)

TABLE 2 | (Continued)

		Domains						
Guideline	**Population**	**Electronic vs manual toothbrush**	**Toothpaste composition**	**Oral rinses**	**Lip moisturizer**	**Brushing oral mucosa and tongue scraping**	**Medical examinations and checkups with experts**	**Others**
NICE Oral health promotion in the community (NICE 2016b)	Adults/children		Quality statement 2: Early years settings and schools. Brushing teeth with fluoride toothpaste twice a day					Quality statement 2: Early years settings and schools. The risk of dental caries and periodontal disease is reduced by good oral health behavior, such as reducing sugar consumption
AAPD Adolescent Oral Health Care (American Academy of Pediatric Dentistry 2020).	Adolescents		Management of caries: Fluoride—Frequency of brushing—Fluoride toothpaste or local application—Composition and concentration Brushing teeth twice daily with a fluoridated dentifrice is recommended to provide continuing topical benefits	Management of caries: Prescription-strength topical fluoride products can be used at home, such as 0.4% stannous fluoride gel, 0.5% fluoride gel or paste, and 0.2% sodium fluoride (NaF). Rinse may be utilized based on an individual's caries pattern or risk status			Management of caries: Professional preventive dental care, on a routine basis, may prevent oral disease or disclose existing disease in its early stages. The timing of periodic oral examinations should take into consideration the individual's needs and risk indicators	Management of caries: Sealant placement is an effective caries-preventive technique that should be considered on an individual basis. Diet analysis should be part of an adolescent's dental health management. Additional considerations in oral/health care of the adolescent. Significant oral, dental, and systemic health consequences and death are associated with all current forms of tobacco use. Piercing and the use of jewelry on intraoral and perioral tissues should be discouraged. Screening and examination for oral signs of sexually transmitted diseases should be part of comprehensive care delivered to the adolescent

(Continues)

TABLE 2 | (Continued)

		Domains						
Guideline	**Population**	**Electronic vs manual toothbrush**	**Toothpaste composition**	**Oral rinses**	**Lip moisturizer**	**Brushing oral mucosa and tongue scraping**	**Medical examinations and checkups with experts**	**Others**
Italian Ministero della Salute National guidelines for oral health promotion and prevention of oral pathologies in adulthood (Ministero della Salute 2015).	Adults/Elderly	Recommendation 7: Proper tooth brushing significantly reduces the presence of dental plaque. Recommendation 8: The use of an electric toothbrush is recommended. Electric toothbrushes, with round heads and oscillating movement, can remove plaque more effectively than manual toothbrushes. In elderly subjects, individualized preventive dental care pathways are advisable based on the level of self-sufficiency. Institutionalized elderly subjects require more preventive and therapeutic interventions	Recommendation 4: The use of fluorinated toothpaste reduces the incidence of tooth decay. Recommendation 5: Toothpastes containing casein phosphopeptide-amorphous calcium phosphate contribute to the re-mineralization processes of dental surfaces	Recommendation 2: The use of mouthwashes and electric toothbrushes can be helpful in plaque control. Rinses with chlorhexidine are effective in reducing plaque and gingivitis, although they alone do not eliminate plaque and do not resolve gingivitis. Essential oils have also been shown to be effective but to a lesser extent than chlorhexidine, as well as rinses based on cetylpyridinium chloride. Subrecommendation 3.1. Adults and elderly individuals at high risk of caries require additional preventive measures with specific fluoride and chlorhexidine-based products			Recommendation 3: Specialized follow-up visits are recommended for adult subjects with specific periodicity based on the conditions of the oral cavity and targeted preventive interventions for the preservation of dental articulation. The frequency of follow-up visits significantly impacts oral health, with fewer specialized checkups correlating to a decrease in the number of teeth. Past dental interventions require regular maintenance. Recommendations vary based on individual risk profiles, with intervals of 3, 6, or 12 months suggested for high-, moderate-, and low-risk patients, respectively. Regular reassessment of recall frequency is advised for adults at high risk	Recommendation 6: Replacing sucrose with xylitol reduces the incidence of cavities. Numerous clinical-epidemiological studies have linked the consumption of fermentable sugars with a high incidence of tooth decay. Replacing sucrose with xylitol reduces the incidence of tooth decay. Recommendation 1: Dental plaque control is a fundamental component in the management of periodontal diseases. Flossing decreases the presence of gingivitis compared to the sole use of the toothbrush. Recommendation 9: For caries prevention, sealing of pits and fissures is recommended. Subrecommendation 5.2: The habit of smoking is strongly discouraged

(Continues)

TABLE 2 | (Continued)

		Domains						
Guideline	**Population**	**Electronic vs manual toothbrush**	**Toothpaste composition**	**Oral rinses**	**Lip moisturizer**	**Brushing oral mucosa and tongue scraping**	**Medical examinations and checkups with experts**	**Others**
NICE Oral health: local authorities and partners (NICE 2014).	General population	Delivering better oral health toolkit. Brush the gum line and each tooth twice daily. Use either a manual or powered toothbrush with a small head and medium texture. Powered toothbrushes reduce plaque and gingivitis. There is no evidence regarding the role of powered versus manual toothbrushes in preventing caries	Delivering better oral health toolkit. Brush at least twice daily with fluoridated toothpaste (1350–1500 ppm fluoride)	Delivering better oral health toolkit. Spit out after brushing and do not rinse to maintain fluoride concentration levels			Recommendation 8: Incorporate oral health promotion in existing services for all children, young people, and adults at high risk of poor oral health. Include regular dental checkups as an integral part of care planning	Delivering better oral health toolkit. Smoking increases the risk of periodontal disease, reduces the benefits of treatment, and increases the chance of losing teeth. The frequency and amount of sugary food and drinks should be reduced. Dental implants require the same level of oral hygiene and maintenance as natural teeth. Clean both between and around the implants carefully with an interdental kit and toothbrushes
SCOHC Oral Health Care for Pregnant Women (SCOHC 2017)	Pregnant women		Oral health during pregnancy—Recommendations for Health Professionals: Brush teeth twice daily with fluoride toothpaste and floss daily	Oral health during pregnancy—Recommendations for Health Professionals: Rinse with a cup of water containing a teaspoon of sodium bicarbonate (baking soda) after vomiting to neutralize the stomach acid. Oral health care for pregnant women: Use of chlorhexidine mouth rinse and fluoride varnish as appropriate			Oral Health Care for Pregnant Women: If the last dental visit took place > 6 months ago or if any oral problems (e.g., toothache, bleeding gums) are identified, schedule an appointment with a dentist as soon as possible	Oral health care for pregnant women: Choose water or low-fat milk as a beverage. Avoid carbonated beverages during pregnancy. Choose fruit rather than fruit juice to meet the recommended daily fruit intake

(Continues)

TABLE 2 | (Continued)

Guideline	Population	Domains							
		Electronic vs manual toothbrush	Toothpaste composition	Oral rinses	Lip moisturizer	Brushing oral mucosa and tongue scraping	Medical examinations and checkups with experts	Others
EJPD National Italian Guidelines for caries prevention in 0 to 12 year-old children (Campus, et al. 2007)	Children		Oral hygiene habits and use of fluoride b: Recommendations for children. Tooth brushing is useful per se in removing dental plaque; when associated with fluoride toothpaste, it is the most powerful preventive measure for caries prevention. Use of toothpaste containing at least 1000 ppm of fluoride					Diet: Strong correlation between dental caries and fermentable carbohydrate intake, frequency, and out-of-meal sugar consumption. Sealants: Pit and fissure sealants are effective in dental caries prevention

Abbreviations: ppm, parts per million; ppmF, parts per million Fluoride.

existed among individuals who used fluoride toothpaste daily (SIGN 2014).

3.1.4 | Medical Visits and Checkups

The timing and content of periodic oral checkups should consider individual needs and risk indicators to determine an effective preventive intervention that ensures maximum benefit for the child or adolescent. The AAPD recommends a 6-month interval for preventive dental visits, with the first examination performed at the eruption of the first tooth and no later than 12 months of age. However, extending the interval to 24 months did not increase the incidence of dental caries in healthy children or young adults (AAPD 2020).

The SIGN guidelines (2014) recommend that oral health promotion interventions should actively encourage daily toothbrushing with fluoride toothpaste. Furthermore, these interventions should be grounded in models such as motivational interviewing. In the context of patient assessment, the inclusion of social history is advised. Additionally, a checklist is recommended for the systematic provision of information.

3.1.5 | Other Indications

As reported in the Oral Health and Nutrition Guidance developed by the National Health Service (NHS) and cited in the CPGs of the SIGN, breastfeeding is a protective factor for children's oral health. However, foods and drinks containing extrinsic sugars other than milk, such as soft drinks, preserves, and spreads, should be minimized and administered only during mealtimes. Many of these foods and beverages are associated with increased dental caries. These guidelines emphasize the importance of breastfeeding for oral health and the significance of limiting the consumption of sugary foods and drinks in preventing dental caries in children (NHS Health Scotland 2012; SIGN 2014). Adopting a balanced diet and reducing the intake of added sugars can promote good oral health and reduce the risk of developing dental cavities (NHS Health Scotland 2012; AAPD 2020).

The guidelines also explored the significant consequences of current e-cigarette use on oral and dental health. The oral and systemic effects of various tobacco consumption methods should be integrated into oral health education for every patient, especially adolescents (AAPD 2020). Additionally, this article addresses the risks associated with oral piercings, both intraoral and perioral, encompassing local and systemic effects, such as pain, bleeding, swelling, hematoma, delayed healing, nerve damage, abscesses, bloodborne infections, endocarditis, choking, enamel fractures, gum trauma, and difficulties in swallowing or aspiration. Furthermore, there is growing concern about the rising prevalence of sexually transmitted infections among adolescents, particularly in the 15–19 age group. Human papillomavirus (HPV) is strongly associated with oral and oropharyngeal cancers (AAPD 2020).

In the context of providing information, it is essential to ensure that both children and parents/caregivers receive appropriate

TABLE 3 | AGREE II.

Title of guideline	1. Scope and purpose (1–3)	2. Stakeholder involvement (4–6)	3. Rigor of development (7–14)	4. Clarity of presentation (15–17)	5. Applicability (18–21)	6. Editorial independence (22–23)	AGREE II domain score
SIGN Dental interventions to prevent caries in children (SIGN 2014).	20	13	44	14	23	9	75%
NICE Oral health for adults in care homes (NICE 2016a)	18	20	44	17	26	9	75%
RNAO Supporting Adults Who Require Assistance (RNAO 2020)	21	20	52	19	21	14	92%
NICE Oral health promotion in the community (NICE 2016b)	17	13	46	14	26	9	79%
AAPD Adolescent Oral Health Care (American Academy of Pediatric Dentistry 2020)	18	11	42	17	14	9	71%
Italian Ministero della Salute National guidelines for oral health promotion and prevention of oral pathologies in adulthood (Ministero della Salute 2015).	19	19	51	19	24	14	90%
NICE Oral health: local authorities and partners (NICE 2014)	21	15	51	16	26	9	90%
SCOHC Oral Health Care for Pregnant Women (SCOHC 2017)	20	17	44	21	18	14	75%
EJPD National Italian Guidelines for caries prevention in 0- to 12-year-old children (Campus et al. 2007)	17	16	49	17	9	10	85%

dietary advice, with a specific focus on managing the frequency of sugary food and drink consumption. When it comes to dental flossing, there is insufficient evidence on its effectiveness, in addition to tooth brushing, to reduce dental caries. Similarly, no recommendations can be made regarding the use of chlorhexidine varnishes. However, the application of fluoride varnish is advised at least twice per year. Resin-based fissure sealants should be applied to permanent molars as early as possible after their eruption to enhance dental protection (SIGN 2014).

3.2 | Adults (Aged 19–65 Years)

In the context of identifying CPGs stratified for the adult population (19–65 years), five guidelines were found to be relevant to the specified age group. Four of the included documents broadly focused on oral health and care for adults (NICE 2014; Ministero della Salute 2015; NICE 2016b, RNAO 2020), while one was specific to pregnant women (South Carolina Oral Health Coalition, [SCOHC] 2017). The RNAO Guideline (2020) is particularly referenced for adults needing assistance. Although not specific to the healthy population, the authors considered this guideline important for inclusion, as it provides valuable and applicable recommendations for the general population. The quality of all included studies was high (Table 3, AGREE II), with CPGs published between 2014 and 2020 in Canada, the United States, Italy, and the United Kingdom.

3.2.1 | Manual vs. Electric Toothbrushes

When used correctly, electric toothbrushes with a round head and oscillating movement can remove plaque more effectively than manual toothbrushes without notable adverse effects (Ministero della Salute 2015). The analyzed CPGs recommended brushing the gumline and each tooth twice daily (before bedtime and at least once more). Therefore, the use of manual or electric toothbrushes with a small head and medium hardness is recommended. Proper tooth brushing reduces the presence of dental plaque significantly (Ministero della Salute 2015). Moderate-strength evidence suggests that electric toothbrushes reduce plaque and gingivitis more than manual toothbrushes. However, no specific recommendations exist regarding the role of electric versus manual toothbrushes for cavity prevention (NICE 2014). The literature highlights statistically significant reductions in both short-term (1–3 months) and long-term (over 3 months) plaque and gingivitis in individuals using electric toothbrushes compared to those using manual toothbrushes (RNAO 2020; Ministero della Salute 2015).

3.2.2 | Toothpaste Composition

The risk of dental caries and periodontal disease is reduced through good oral health practices, such as decreasing sugar consumption and brushing teeth with fluoride toothpaste twice daily (NICE 2014). The use of fluoride toothpaste is crucial for daily oral hygiene because of its cariostatic action, which leads to increased resistance to demineralization of dental hard tissues (Ministero della Salute 2015). According to the RNAO recommendations, brushing teeth with fluoride-containing toothpaste is the primary nonprofessional intervention to prevent caries. All CPGs identified in this review agree that toothpaste containing 1000–1250 ppmF is more effective in preventing caries than fluoride-free toothpaste. Daily use of toothpaste with a fluoride concentration of not less than 1000 ppm is strongly recommended for individuals of all ages (NICE 2016b; Ministero della Salute 2015; RNAO 2020). However, there is a lack of evidence regarding the impact of different fluoride concentrations in toothpaste on oral health (RNAO 2020). Regarding oral care for pregnant women, guidelines recommend brushing teeth twice a day with fluoride toothpaste, as well as in the case of episodes of nausea and vomiting (SCOHC 2017).

3.2.3 | Oral Rinses

Mouth rinses containing chlorhexidine or sodium fluoride are recommended for their antibacterial and anticaries actions, along with a beneficial moisturizing effect on mucous membranes, effectively reducing plaque and gingivitis (Ministero della Salute 2015). Even during pregnancy, using a chlorhexidine mouth rinse and fluoride varnish is appropriate for strategies reducing the cariogenic bacterial load (SCOHC 2017).

Specifically, the CPG developed by the RNAO (2020) assessed the efficacy of oral rinses with various components, such as baking soda and salt water, used for mucositis, mouth sores, and sore throats. This soothes sores and prevents infections, even in immunocompromised patients. Cetylpyridinium chloride is effective against plaque and gingivitis but is not as effective as chlorhexidine or essential oils in reducing gingival inflammation. Chlorhexidine (CHX), in liquid form, has an optimal dose of 10 mL of 0.2% or 15 mL of 0.12% solution twice daily, with a rinsing time of 30 s. A significant reduction was observed in plaque buildup and a moderate decrease in gingivitis with the use of a toothbrush combined with CHX rinses. For essential oils, mouthwashes with or without alcohol are associated with a significant reduction in gingivitis and plaque compared to mechanical oral hygiene alone. Furthermore, fluoride reduces the incidence of caries and helps repair early-stage cavities, making tooth enamel stronger. Povidone-iodine can be used as part of routine oral hygiene care by gargling for 30 s with 10–15 mL of diluted or undiluted product, followed by mouth rinsing, and saline solution can be used for mouth, gum, or throat pain, or for those who have undergone a dental procedure (RNAO 2020). For pregnant women experiencing episodes of nausea and vomiting, the oral cavity was rinsed with a cup of water containing a teaspoon of baking soda after each episode to neutralize stomach acids (SCOHC 2017).

3.2.4 | Medical Visits and Checkups

The periodicity of follow-up visits significantly influences oral health, and the frequency of reassessments and professional oral hygiene appointments should be tailored to everyone's risk profile. Regular dental checkups are crucial as an integral part of care planning. Intervals of 3, 6, and 12 months are recommended for patients at high, moderate, and low risk of caries and periodontal diseases, respectively. In high-risk adults, the

recall frequency should be reassessed periodically (Ministero della Salute 2015; NICE 2014). For pregnant women, if the last dental visit occurred more than 6 months prior or if specific oral problems were identified (such as toothaches or gum bleeding), it is important to schedule an appointment with a dentist as soon as possible (SCOHC 2017).

3.2.5 | Other Indications

An expert group advised that, in addition to hydrating the lips, it is also important to moisturize the oral cavity to prevent the accumulation of membranous substances. Oral lubricants are recommended to alleviate discomfort, moisten the oral mucosa, and lubricate the oral tissues (RNAO 2020). No evidence suggests that using a tongue scraper prevents poor breathing (RNAO 2020).

The Italian Ministero della Salute's guidelines (2015) emphasize that using dental floss reduces the presence of gingivitis compared with using only a toothbrush. Individuals must choose the most appropriate tool for interdental cleaning based on the size of the proximal spaces, the presence of prosthetics, manual dexterity, and compliance (single-tufted brushes, interdental brushes, wooden or rubber tips, and oral irrigators).

Although recommended for caries prevention, sealing dental fissures in adults does not provide unanimous scientific evidence. Therefore, in-depth clinical trials are necessary to evaluate the appropriate preventive cost–benefit strategy and determine the procedures and materials to be used (Ministero della Salute 2015).

Good oral health behaviors, such as reduced sugar consumption, are known to reduce the risk of dental caries and periodontal diseases (NICE 2016b). Clinical-epidemiological studies have linked the consumption of fermentable sugars to a high incidence of cavities. The substitution of sucrose with xylitol has been proven to be effective in reducing caries incidence (Ministero della Salute 2015). The frequency and quantity of sugary foods and drinks should be reduced to promote healthier foods, snacks (e.g., fresh fruit), and beverages (water and milk) (NICE 2014). For pregnant women, evidence suggests choosing water or skim milk as the primary beverage, avoiding carbonated drinks, and preferring fresh fruit over fruit juice to meet the recommended daily fruit intake requirements (SCOHC 2017).

Smoking increases the risk of periodontal disease, diminishes treatment benefits, and increases the likelihood of tooth loss (Ministero della Salute 2015; NICE 2014). Quitting smoking has been shown to reverse negative effects on periodontal structures and provide oral health benefits across all age groups (Ministero della Salute 2015).

3.3 | Elderly (Seniors Aged 65 Years and Older)

Four CPGs were identified for those aged 65 and older. Three of these are similar to the preceding section on adults (NICE 2014; Ministero della Salute 2015; RNAO 2020), and one has been created to provide guidelines for dental care for the elderly living in assisted living facilities (NICE 2016a). Studies that included CPGs published between 2014 and 2020 and referenced the UK, Canada, and Italy were of high quality (Table 3).

3.3.1 | Manual vs. Electric Toothbrushes

Physical limitations due to age, arthritis, deteriorating vision, or disability render many elderly individuals unable to perform oral hygiene correctly, exposing them to a higher risk of developing dental caries, gingivitis, and periodontitis. Individuals requiring assistance with oral hygiene should be encouraged and supervised to brush their teeth at least twice daily, as recommended by the Ontario Dental Hygienists' Association (RNAO 2020). Elderly patients should be encouraged to use a toothbrush of their preference, whether manual or electric/battery-powered; however, using an electric toothbrush may be easier for individuals with mobility issues (NICE 2016a). Elderly individuals in institutions typically experience a greater compromise in oral health, with fewer teeth and an increased likelihood of losing the remaining teeth, compared to those residing in their homes. In elderly individuals, individualized preventive dental care pathways are advisable based on the level of self-sufficiency. Elderly individuals in institutions also require preventive and therapeutic interventions (Ministero della Salute 2015). Healthcare practitioners have reported that electric toothbrushes are less time-consuming and easier to use than manual ones, further showing a statistically significant reduction in plaque and gingivitis in both the short and long term (NICE 2014, RNAO 2020).

3.3.2 | Toothpaste Composition

Numerous clinical studies have highlighted that, in adulthood and old age, the use of fluoride toothpaste leads to a significant reduction in new caries. The reduction rate was 33.3% (Ministero della Salute 2015; NICE 2016b). The NICE (2016a) guidelines observed that most elderly individuals living in or considering moving to a care home may share common factors that could influence their oral health, such as not having benefited from the introduction of fluoride toothpaste in 1970 (NICE 2016a). For individuals with natural dentition, fluoride toothpaste should be used twice daily to brush their teeth and to prevent dental caries. The primary intervention to prevent dental caries is regular tooth brushing with fluoride toothpaste, with concentrations ranging from 1350 to 1500 ppm (NICE 2014; RNAO 2020). Therefore, fluoride prophylaxis is necessary for all individuals. Although the data are limited to the older population, fluoride remains the cornerstone of prevention in older individuals (Ministero della Salute 2015).

3.3.3 | Oral Rinses

Regarding the use of products for oral rinsing, reference is made to the information provided in the chapter "Oral Rinses – Adults," as the recommendations are applicable to both populations. In addition to what has already been stated, it is important to emphasize that scientific evidence demonstrates that oral rinses are not recommended for individuals at risk of aspiration (RNAO 2020).

Adults, particularly elderly individuals at high risk of caries, require additional preventive measures with specific products containing fluoride and chlorhexidine. Several studies have confirmed that rinses containing chlorhexidine or sodium fluoride (NaF) are indicated for their antibacterial and anticaries actions, in addition to their beneficial moisturizing effect on the mucous membranes. Daily rinses with NaF at concentrations ranging from 0.2– to 1.1– have proven useful in reducing the incidence of caries, especially root caries, in elderly individuals with high-risk profiles (Ministero della Salute 2015). The CPGs developed by NICE (2014) also emphasize the need for the daily use of a fluoride mouthwash (0.05% NaF). However, it is crucial that this occurs at a different time from tooth brushing to maintain high fluoride concentration levels derived from toothpaste.

3.3.4 | Medical Visits and Checkups

However, the oral health requirements of individuals with dementia, low life expectancy, and poor physical health have not been thoroughly studied. Older adults may face challenges in oral care because of functional disability, reduced hand-eye coordination, and declining autonomy, which can lead to difficulties in accessing oral health professionals (RNAO 2020). To guarantee fair access to oral health treatment, it is critical to understand how oral health interventions affect these populations (NICE 2016a).

For the elderly, access inequalities are strongly linked to the economic condition of the family; individuals over 65 years of age with limited or insufficient financial resources have significantly reduced utilization of preventive and controlled dental visits (−7%). The frequency of follow-up appointments and professional oral hygiene should be tailored to everyone's risk profile. As identified for the adult population, in the elderly, intervals of 3, 6, and 12 months are recommended for patients at high, moderate, and low risk of caries and periodontal diseases, respectively. In high-risk adult patients, recall frequency should be periodically reassessed (Ministero della Salute 2015). The NICE guidelines (2004) specify that the recall interval for the patient should be 3, 6, 9, or 12 months if the patient is under 18 years old, or 3, 6, 9, 12, 15, 18, 21, or 24 months if the patient is 18 years of age or older, as updated in 2023.

3.3.5 | Other Indications

Brushing the Oral Mucosa and Tongue Scraping.

When providing assistance, it is important to be aware of the delicate structure of the oral mucosa, particularly in elderly individuals. Residues of food or other substances (if present) should be dried, and only tongue brushing should be performed. It is also important to note that tongue cleaning may induce vomiting or a vomiting reflex. However, educating individuals and their caregivers on the correct use of tongue-cleaning techniques (such as learning to relax the tongue and muscles or exhaling during cleaning) can prevent this from occurring (RNAO 2020). In a randomized controlled study included in the reference CPGs, gels were found to increase moisture levels in the mouth effectively. Increased moisture and hydration of the tongue can reduce bacterial adherence to the tongue, thereby decreasing the risk of developing pneumonia due to bacterial aspiration (Ministero della Salute 2015; RNAO 2020).

3.3.6 | Dental Prosthesis Care

The guidelines emphasize the proper care of dentures to ensure longevity. Recommendations include the use of a soft-bristle brush and neutral soap for cleaning, precautions to prevent denture breakage, and avoidance of harmful substances. Daily oral hygiene, not wearing dentures during sleep, and proper soaking are recommended. Consultation with a dentist is recommended for all issues. Failure to remove or clean dentures may lead to health risks such as aspiration pneumonia. Healthcare facilities should mark the dentures to prevent loss or inadvertent exchange (NICE 2016a; RNAO 2020).

4 | Discussion

This systematic review of CPGs stands out for its inclusive and extensive guidance on oral care, unlike most literature that concentrates on specific populations like cleft lip and palate children, pregnant women, and patients with chronic conditions.

In all age groups, the results demonstrate that there is no evidence to show that electric toothbrushes are more effective than manual toothbrushes in preventing dental caries, although they may reduce plaque and gum bleeding. The similar effectiveness of electric and manual toothbrushes in preventing dental caries across various age groups can be attributed to several factors. Key among these is the importance of brushing technique and adherence; without proper methods, the advantages of either type may be reduced. Additionally, brushing frequency plays a vital role; consistent oral hygiene practices can yield similar results regardless of the toothbrush type. Personal preference for manual toothbrushes, combined with comprehensive oral hygiene habits such as flossing and dietary considerations, may also contribute. Furthermore, individual biological variability, such as differences in saliva composition and the oral microbiome, can impact caries development (SIGN 2014; Ministero della Salute 2015; RNAO 2020). Although brushing alone has been demonstrated to be useful for the removal of dental plaque, the primary non-professional intervention for preventing cavities remains the use of fluoride-containing toothpaste (SIGN 2014; RNAO 2020), even advised and recommended for pregnant women experiencing nausea and vomiting episodes (SCOHC 2017). It is important to emphasize that, especially among the younger population, rinsing with water after brushing reduces the preventive effect of fluoride toothpaste against cavities and should, therefore, be discouraged (SIGN 2014).

For adults, mouth rinses based on chlorhexidine or sodium fluoride are recommended for their antibacterial and anticavity actions, in addition to their beneficial moisturizing effects on the mucous membranes. Elderly individuals at high risk of cavities require additional preventive measures using specific products containing fluoride and chlorhexidine (Ministero della Salute 2015). No evidence suggests that tongue scrapers are effective for tongue cleaning in children and adults; however, it is important

to consider the delicate nature of the oral mucosa, particularly in elderly people, when providing assistance. Residual food or other substances must be dried before brushing the tongue (RNAO 2020). Regarding expert checkup visits, the AAPD recommends a 6-month interval for dental visits in healthy children and young adults. However, a 24-month interval does not increase the incidence of dental caries (Hahn, Kraus, and Hooper-Lane 2017; AAPD 2020). The frequency of checkup visits affects oral health, and the frequency of reevaluation and professional oral hygiene appointments should be based on each individual's risk profile (SIGN 2014; Ministero della Salute 2015).

Unifying the recommendations across age groups revealed a consistent emphasis on maintaining good oral health behaviors. This includes the pivotal role of fluoride toothpaste, a recurring theme that reinforces its significance in preventive oral care. The guidelines uniformly stress the importance of regular dental checkups, adapting to everyone's risk profile. Oral health in pregnant women is a shared concern across all age categories. Furthermore, preventive measures, such as fluoride and chlorhexidine use, are crucial throughout all age groups. The universal imperative of smoking cessation has been echoed, underscoring its impact on overall oral health, irrespective of age.

To address the unique oral health needs of elderly individuals, guidelines have emphasized the importance of proper denture care to prevent complications and maintain oral health. Furthermore, they underscored the importance of regular dental visits and tailored oral hygiene routines, considering factors such as mobility limitations and age-related changes in oral tissues. When nursing care is suboptimal, patients experience negative healthcare outcomes (Richards et al. 2018). MNC is associated with increased adverse events, decreased quality of care reported by nurses, decreased patient satisfaction, and increased patient readmission rates (Smith et al. 2018). Therefore, oral care is an important aspect of healthcare, and nurses play a vital role in providing effective oral care and promoting oral hygiene through patient education (Bhagat et al. 2020).

The combined findings from the retrieved literature highlight several important points for practical health care across different age groups. Age-specific interventions in oral care are crucial, such as recommending rotating-oscillating electric toothbrushes for children and considering physical limitations in the elderly. This emphasizes the need for customized dental care approaches. The shift toward personalized dental checkups based on individual risk profiles moves away from a one-size-fits-all model. Effective health care should evaluate patient-specific risks and adjust the frequency of dental visits accordingly. Additionally, behavioral factors, such as avoiding additional rinsing with water after brushing and reducing sugary food consumption in children, underscore the importance of comprehensive health education provided early at the parental level.

Conducting a systematic review of CPGs serves a crucial role in what is termed evidence transfer. Indeed, this type of secondary literature provides healthcare professionals with a comprehensive synthesis of existing knowledge, facilitating informed decision-making. The primary objective of producing a review of CPGs is to compile and present the current state of knowledge, making it readily accessible. While the ultimate goal is to translate these findings into clinical practice, the initial and essential step is to ensure that healthcare professionals have access to well-organized, evidence-based information. This foundational availability of knowledge supports improved clinical judgment and lays the groundwork for eventual adaptation and practical application (Munn et al. 2018; Gallione et al. 2022). At patients level, the adoption of standardized evidence-based practices ensures equitable access to preventive and therapeutic oral care. By addressing critical areas such as the use of fluoride toothpaste, regular dental checkups, and tailored recommendations for vulnerable populations like children, the elderly, and those in assisted living, patients can benefit from reduced incidence of dental caries, periodontal diseases, and associated complications (SIGN 2014; Ministero della Salute 2015; NICE 2016a). This not only improves oral health but also enhances overall quality of life, supporting better nutrition, communication, and psychosocial well-being (Chan et al. 2023). For nurses, these findings empower them to integrate oral care into daily clinical practice with confidence. Highlighting the often-overlooked importance of oral health, this review equips nursing professionals with actionable guidelines that strengthen their role in preventive care and patient education (RNAO 2020). It also serves as a foundation for targeted training programs, ensuring that nurses and other health professionals are well-prepared to address oral care across diverse patient demographics (Bhagat et al. 2020).

At a societal level, implementing the reviewed guidelines could lead to substantial public health benefits, including the reduction of healthcare costs associated with advanced dental procedures and systemic health issues linked to poor oral hygiene (Peres et al. 2019; GBD 2017 Oral Disorders Collaborators 2020). These findings align with the broader framework of addressing oral health disparities, emphasizing the critical role of sustainable development policies, in reducing inequalities and ensuring equitable access to preventive dental care (Foláyan et al. 2024). Indeed this systematic review of CPGs supports the development of public health campaigns and community outreach programs to foster a culture of prevention (NICE 2016b). Dedicated nursing roles in community care settings can further enhance screening and prevention efforts by actively engaging families to promote oral hygiene practices (ICN 2024). This comprehensive approach provides a solid foundation for policymakers and advocates to improve oral health policies and outcomes across all levels.

Finally, this review highlights areas for further research and development, encouraging the conduct of primary efficacy studies with high methodological rigor, which would allow for a greater impact on clinical practice (Martin, Johnston, and Archer 2020).

Although CPGs offer valuable insights, their reliance on evidence may introduce limitations. The focus on general guidelines may not be universally applicable due to individual, cultural, and socioeconomic differences, such as access to dental care based on socioeconomic status, geographic differences affecting dental care availability, and the unique dental needs of subgroups within age categories. Additionally, data on individual behaviors, local healthcare policies, long-term effectiveness of interventions, and patient compliance are essential. To effectively implement recommendations, healthcare providers

should consider local contexts, individual patient characteristics, and economic disparities. The evolving nature of dental research and the need to integrate the latest evidence into recommendations must also be acknowledged.

5 | Conclusion

Promoting practical health assistance in oral care involves educating patients and caregivers on age-specific practices, incorporating technological advancements, and implementing community outreach programs to address socioeconomic limitations. It is essential to continuously update healthcare professionals on evidence-based practices for optimal care. An effective and equitable approach tailors recommendations, addresses evidence gaps, and considers the socioeconomic landscape.

5.1 | Relevance for Clinical Practice

Based on the findings of this review, nursing professionals can implement age-specific oral hygiene practices and personalized oral care, utilizing these strategies to enhance patient education and improve overall oral health outcomes.

Author Contributions

Chiara Gallione: conceptualization, writing - original draft, methodology, formal analysis, project administration, data curation. **Erika Bassi:** supervision, writing - review and editing. **Arianna Cattaneo:** conceptualization, formal analysis, methodology, visualization. **Erica Busca**: data curation, supervision. **Ines Basso:** supervision, writing - review and editing. **Alberto Dal Molin:** supervision, writing - review and editing.

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Ethics Statement

The authors have nothing to report.

Consent

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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