

REVIEW ARTICLE

Association Between Chronic Diseases, Geriatric Syndromes, and Oral Health Problems in Older Adults Towards Strategising Optimum Oral Health Care: A Narrative Review

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ABSTRACT

This review aimed to explore the association of common chronic diseases and geriatric syndromes and common oral health (OH) problems in older adults, along with the barriers to OH care. A comprehensive search was conducted in Scopus, PubMed, and Google Scholar using various relevant search terms. Articles of different evidence levels were included, while non-English publications and those without full-text availability were excluded. Common age-related diseases and geriatric syndromes, such as hypertension, diabetes mellitus, and cognitive impairment, increase the risk of periodontal disease, dental caries and potentially oral cancer. These systemic conditions and their treatments heighten vulnerability to OH issues. Poor OH status can worsen chronic conditions, creating a vicious cycle that further compromises OH. The interplay between oral and systemic health underscores the need for dental professionals to update on geriatric dentistry and plan strategies addressing the growing demand of OH care for older adults effectively.

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INTRODUCTION

The global population is currently undergoing a significant ageing process. The United Nations defines an ageing population as those aged 60 years and above (1). In alignment with this definition, the government of Malaysia also classifies older adults as those aged 60 and above (2). By 2030, approximately one in every six individuals worldwide will have reached the age of 60 or older, representing a substantial increase from the one billion recorded in 2020 to an estimated 1.4 billion in 2030 (3). According to the Khazanah Research Institute, projections by the Department of Statistics (DOS) indicate that Malaysia is expected to attain ageing population status by 2035, with 15% of the total population being 60 years or older (4).

This remarkable increase of ageing population stems from numerous advancements in health, including better nutrition, clean water, sanitation, neonatal care, antibiotics, vaccines, and other medical technologies

and public health initiatives. Additionally, it is driven by improved living standards, economic growth, and poverty reduction (5). The increased life expectancy and a growing proportion of the older population shift from predominantly young to older populations heightened the demand for financial, health, and social care, potentially extending periods of dependency and frailty (6).

Ageing is associated with an elevated risk of chronic diseases (CDs) (7,8). CDs are defined as conditions that persist for one year or more, requiring ongoing medical attention, limiting activities of daily living (ADLs), or both (9). The term "ADLs" encompasses fundamental skills essential for independent self-care, including eating, bathing, mobility, and maintaining oral hygiene (10). Moreover, the ageing process, which leads to a heightened pro-inflammatory state, increases susceptibility to autoimmune, inflammatory, and infectious diseases, potentially affecting gum tissues and contributing to conditions such as periodontitis (11). Additionally, older adults are at a higher risk for dental caries due to oral conditions such as dry mouth, multiple dental restorations, and poor oral hygiene, compared to younger individuals (12).

Studies demonstrate associations between oral health

(OH) and various health conditions (13,14). For instance, geriatric syndromes, including cognitive impairment and dementia are linked to higher prevalence of dental caries, decline in restorations, and deterioration in oral and denture hygiene (15). Furthermore, poor OH is also strongly associated with systemic health conditions, such as cardiovascular diseases, increased stroke risk, and diabetes, all of which are linked to periodontal disease (13,14).

Given the rapid ageing of the global population, it is imperative to understand the multifaceted role of OH in the broader spectrum of geriatric health. This understanding is crucial because poor OH not only compromised the OH status but also could aggravate CDs, increase healthcare costs, and diminish the quality of life among the older adults. Therefore, this review aimed to explore common CDs and other geriatric syndromes and their consequences; common OH problems in older adults, barriers and strategies towards effective OH care for older adults. A comprehensive review that synthesizes the existing literature on this topic will fill this gap, providing valuable insights for healthcare providers, policymakers, and researchers. Development of an integrated approach in managing the health and OH towards improving their quality of life is crucial.

MATERIAL AND METHODS

An electronic search was conducted in the databases Scopus, PubMed, and Google Scholar using a combination of search terms: 'elderly,' 'older adults,' 'chronic diseases,' 'oral health,' and 'oral diseases'. We limited our initial search to Scopus, PubMed, and Google Scholar due to their distinct advantages in covering a broad spectrum of academic literature while Google Scholar was selected to capture grey literature, theses, and conference papers that might not be indexed in traditional databases. Additional references through manual search were obtained from articles provided in the databases. We conducted a manual search by reviewing the reference lists of relevant articles to identify additional studies, reports, or papers that could contribute to this research. All types of articles from 2010 to 2023 with different levels of evidence were included. Articles which were not in English and were not available in full text were excluded. In summary, Figure 1 illustrates the flowchart outlining the research process.

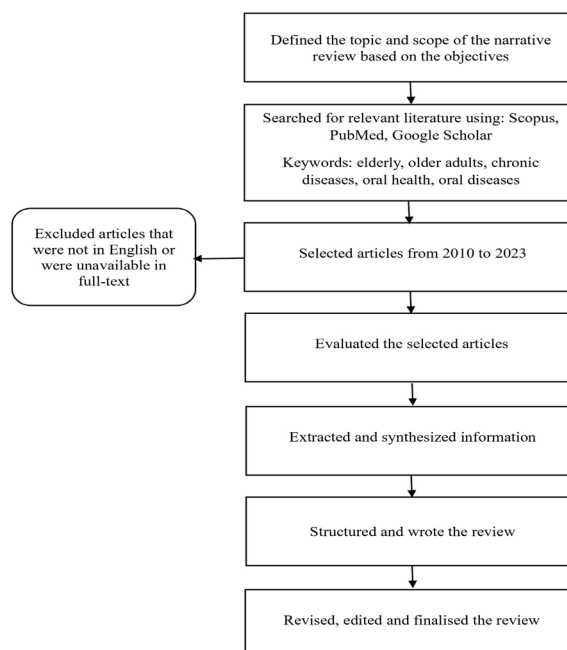


Figure 1: Flowchart of the narrative review process

DISCUSSION

In this discussion, we reviewed the literature, summarizing key findings related to common CDs and their consequences, OH problems, and the barriers in providing OH care for the older adults. Additionally, we explored strategies to enhance OH care for this population. This section also addressed the limitations of the reviewed literature.

1. Chronic diseases and their consequences

A systematic review and meta-analysis showed that the prevalence of CDs is high in ageing population (16). In Germany, 25% of older adults presented with at least four CDs, most commonly hypertension, lipid metabolism disorders, diabetes, and coronary heart disease (17). Whereas in Haikou, China, 31.7% had at least one of four CDs—hypertension, diabetes mellitus, chronic obstructive pulmonary disease, or stroke (18). Meanwhile, the National Health and Morbidity Survey (NHMS) 2015 in Malaysia reported that about one-third of older adults had non-communicable diseases (19). Diabetes mellitus and hypertension consistently emerge as the most common CDs (18–23), correlating with older age, smoking, and obesity (16,18).

1.1 Hypertension

Study indicates that the prevalence of total hypertension escalates with age, from 9% of adults aged 16 to 44 to 60% of adults aged 65 and over (24). About 26% of older population in China having hypertension (18), 33.1% in Malaysia (19) and 38% in India (22). As people age, their levels of physical activity tend to decrease, leading to more sedentary lifestyles and increased body weight further contribute to this condition (25). Furthermore, periodontitis has been implicated in uncontrolled hypertension, potentially via elevated white blood cell and neutrophil counts. (26).

Worsening the situation further, high blood pressure is a major risk factor for cardiovascular disease (CVD) (27). In older adults, arterial stiffness leads to an increase in systolic blood pressure and pulse pressure, coupled with a decline in diastolic blood pressure. These changes are strong predictors of major CVD events and overall mortality (28). Additionally, research by Van Nguyen et al. (2021) found that 26.1% of older adults aged 65 and above with heart failure experienced impairments in physical activities such as bathing and oral care, primarily due to muscle weakness (29,30). These functional impairments significantly increase the risk of vascular cognitive impairment and Alzheimer's disease (31), exacerbating OH challenges in older adults.

The relationship between OH behaviours and CVD may be explained by several biological mechanisms. For example, previous studies have confirmed that poor oral hygiene may increase the potential risk of CVD by affecting vascular endothelial function or inflammatory responses (32,33). Endothelial dysfunction and systemic inflammation by increasing concentrations of both C-reactive protein and fibrinogen play an important role in the pathogenesis of atherosclerosis, which is a major contributor to cardiovascular events (33–35). Hence, promoting oral hygiene may mitigate hypertension and its complications.

1.2 Diabetes mellitus

The global prevalence of diabetes mellitus peaks between 75–79 years, at 24.4%. In this age group, prevalence was highest in the north Africa and Middle East super-region, at 39.4% and lowest in central Europe, eastern Europe, and central Asia, at 19.8% (36). Findings from the National Health and Morbidity Survey (NHMS) 2015 showed that the prevalence of diabetes mellitus among older adults over 60 in Malaysia was 38.8% (19). Diabetes mellitus is a chronic condition characterized by an accelerated metabolic ageing process, often resulting in a range of physical issues commonly observed in the older population. These issues encompass, physical, visual and lower body disability (37). Older adults with diabetes mellitus are more prone to premature death and coexisting conditions such as hypertension, coronary heart disease, and stroke. They also face a higher risk of various geriatric syndromes,

including functional disability, polypharmacy, cognitive impairment, musculoskeletal disorders, depression, urinary incontinence, injurious falls, persistent pain, and frailty (38–40).

Additionally, poor OH particularly periodontitis and diabetes are chronic conditions that share a bidirectional relationship: diabetes can accelerate the onset and progression of periodontitis, while periodontitis can impair glycemic control and potentially contribute to diabetic complications (41). The elevated levels of inflammatory cytokines such as $\text{TNF}\alpha$, $\text{IL-1}\beta$, and C-reactive protein (CRP) perpetuate inflammation, driving osteoclast differentiation and accelerating tissue destruction within the oral cavity (42,43).

1.3 Cognitive impairment

Subjective cognitive decline (SCD) commonly occurs among the older adults and also may be influenced by factors such as loneliness, and depression (44,45). Having SCD might complicate the management of chronic conditions, and patients and providers should be aware of increased risk for cognitive decline in the presence of CDs (45). According to the systematic review, the global prevalence of cognitive impairment is recognised as one of the geriatric syndromes ranges from 5.1% to 41% among community-dwelling older adults (46). Dementia is typically diagnosed when acquired cognitive impairment has become severe enough to compromise social and/or occupational functioning (47).

Memory loss and disorientation associated with dementia can lead to inadequate oral care and reduce its effectiveness (48). Furthermore, individuals with dementia may have difficulty identifying and reporting OH problems like periodontitis, gingival bleeding, missing teeth, and dental caries (49). This underscores the importance of regular dental check-ups to detect and address OH problems early in this population. Hence, as dementia progresses, individuals often become reliant on others for personal care, including oral hygiene (48,50).

1.4 Musculoskeletal disorders

Musculoskeletal disorders include conditions affecting the joints (e.g., osteoarthritis, rheumatoid arthritis, psoriatic arthritis, gout, spondyloarthritis), bones (e.g., osteoporosis, osteopenia, fragility fractures, traumatic fractures), and muscles (e.g., sarcopenia) (51). These disorders remain prevalent among older populations, and with ongoing population growth and ageing, the number of individuals living with musculoskeletal disorders and associated geriatric syndrome such as functional limitations is rapidly increasing (51). Additionally, women are more likely than men to report musculoskeletal pain in older populations, particularly in developed countries (52).

The prevailing musculoskeletal disorders in older adults can give rise to detriments in both the performance of ADLs and quality of life. For example, osteoarthritis can manifest in various joints, affecting the hands, feet, facet joints, and major weight-bearing joints like the knees and hips (53,54). As a result, joint degeneration in osteoarthritis induces discomfort, subsequently leading to stiffness and restricted range of motion (54) and more likely to experience problems with activities of daily living (ADL) compared to those without these conditions (55). A cross-sectional study found that older adults with moderate to severe musculoskeletal pain are 1.8 times more likely to face mobility limitations (56). Consequently, this condition creates barriers in accessing OH care services (57).

1.5 Impairment in ADL among older adults with chronic diseases and geriatric syndrome

Previous study has highlighted a significant burden of functional limitations among older individuals, as well as a strong association between pre-existing chronic diseases and functional disability (58). CDs such as hypertension, diabetes mellitus, heart problems, chronic lung diseases, osteoarthritis, osteoporosis, stroke, and asthma were associated with the increased risk of ADL disability among middle age and older populations (58–60). A recent population-based cohort study in China involving adults over 45 years of age found that, after four years of follow-up, individuals with at least one chronic disease had a 39% greater risk of ADL disability (61). Additionally, studies showed a significant positive association between geriatric syndromes such as cognitive impairment (e.g., Alzheimer's disease) and musculoskeletal conditions with ADL function in older adults (55,62). Furthermore, ageing itself, even in the absence of specific diseases, often contributes to increased frailty (63). Given these functional limitations, various studies have demonstrated an association between ADL impairment particularly the ability to perform oral self-care and OH status (64–67).

1.6 Polypharmacy

Polypharmacy in older adults is often difficult to avoid because it is associated with a number of diseases suffered by older adults. Medications like analgesic, cardiovascular and gastrointestinal drugs have shown a significant association with the development of xerostomia (68). There is a strong association between general health and OH with xerostomia in older adults (69). Furthermore, studies have shown that polypharmacy was associated with poor OH status such as periodontal disease and increased the number of decayed, missed and filled teeth (DMFT) (70–72). Additionally, medications that influence the central nervous system, such as antipsychotics, anxiolytics, and antidepressants, directly hinder the nervous system responsible for swallowing. This inhibition results in motor and functional impairment, as well as sensory disturbances in the oral cavity and pharynx, thereby

affecting all stages of feeding and swallowing (73).

2. Common oral health problem of older adults

Multiple studies have indicated a significant connection between CDs and OH, including conditions such as Type-II Diabetes Mellitus, cardiovascular diseases, cancer, depression, mental health disorders and respiratory tract infections (74–77). Some diseases cause problems in the mouth, while some oral problems are linked to chronic conditions (14,76)

2.1 Dental Caries

Dental caries is a non-communicable disease primarily caused by the demineralization of tooth enamel due to the acidic by-products produced by bacteria in dental biofilm (78). This process is closely related to various modifiable behavioural risk factors and environmental factors such as poor oral hygiene, poor dietary habits and lack of fluoride exposure (79,80). A systematic review and meta-analysis conclude that older adults, with higher tooth retention implying more dental caries incidence (81). The prevalence of dental caries ranged from 25% (Australia) to 99% (South Africa), while the prevalence of root caries ranged from 8% (Finland) to 74% (Brazil) of older adults in community dwellers. The situation was even worse in institutionalised older adults of which the mean DMFT score varied from 6.9 (Malawi) to 29.7 (South Africa) (81). The global median of mean DMFT score was 21.9 (82). A Survey in Kuala Lumpur, Malaysia in 2013 found that the maximum DMFT was noted in the older adults at the aged of 60 and above in both males (16.57) and females (18.53) (83).

Poor oral hygiene is associated with chronic conditions like CVD and Type-II Diabetes Mellitus, among middle-aged and older adults (14). This association is also supported by Kim et. al., 2019 who found that patients with dental caries have an elevated risk of coronary heart disease as compared with patients without dental caries (84). A ten-year cohort study has established a clear association between oral diseases and diabetes (77). In a recent study by Vieira lima et. al., (2023) found that blood glucose levels have an impact on both the number of root caries lesions and salivary glucose levels in active coronal caries. It's noteworthy that as glycated haemoglobin or fasting blood glucose levels increase by one unit, there is a slight increment in root caries lesions. Additionally, the influence of blood hyperglycaemia on root caries appears to be localized, triggered by an increase in glucose levels in saliva and gingival crevicular fluid, as well as by the modulation of biofilm on tooth root surfaces (85). Furthermore, poor OH status is also associated with mental illness (86). Individuals suffering from severe mental illnesses exhibit notably greater decayed, missing and filled teeth (DMFT) in comparison to the general population. The research revealed that there are correlations between the DMFT and missing teeth metrics and the Mini-Mental State Examination scores (86).

With the increasing number of older adults experiencing comorbidities and polypharmacy, there is a corresponding rise in cases of xerostomia and declining OH (87). The ageing process itself also leads to notable changes in the salivary glands, including acinar atrophy, duct expansion, collagen deposition, reduced mitochondrial respiratory chain activity, and an inflammatory microenvironment—all of which can contribute to progressive salivary gland dysfunction (88). Consequently, xerostomia can adversely affect dietary intake, leading to poor nutrition and an increased risk of OH issues including gingivitis, periodontitis, dental caries, fungal infections (e.g., candidiasis), halitosis, and accelerated enamel erosion (89). Ultimately, these factors can negatively impact overall quality of life (87).

2.2 Periodontal disease

The prevalence of periodontal disease rises with age (90). Periodontitis is the most common among older adults, particularly in populations from high-income countries. Older adults exhibited the highest prevalence of deep periodontal pockets (measuring 4-5 mm and 6+ mm) compared to young adults and adolescents (90). Older populations are generally more susceptible to periodontal disease, due to the biological ageing process, the impact of a decline in general health status, presence of comorbidities, and decreasing dexterity and cognition that affects self-care (91). Frailty plays an important role in the health of older populations. It is evident that both frailty and periodontal disease share several risk factors. Age-related changes to the inflammatory response which involved IL-6, TNF α , IL-1 β and Senescent Cells may be the closest pathophysiological explanation underlying both frailty and periodontal disease (92).

Notably, previous studies have increasingly pointed out the correlation between periodontitis and systemic diseases (75,76). A systematic review and meta-analysis conclude that there is a positive bidirectional association between periodontal disease and diabetes mellitus (41). The presence of periodontal pathogens like *Porphyromonas gingivalis* and *Actinobacillus actinomycetemcomitans* as causative agents in periodontal disease along with their metabolic by-products in the oral environment, may indeed have an immunomodulatory impact extending beyond the oral cavity and affected systemic conditions (74).

Additionally, an increased severity of periodontal disease has been linked to a 20% higher risk of developing hypertension (76). A systematic review and meta-analysis revealed a linear relationship between periodontitis and hypertension, suggesting that effective periodontal management could influence blood pressure control. These findings underscore the potential benefits of improving oral health to enhance cardiovascular outcomes in the general population (93). Moreover, polypharmacy can adversely affect periodontal tissues. A notable example is drug-induced gingival overgrowth—a

side effect commonly associated with anticonvulsants, immunosuppressants, and calcium channel blockers (94). This gingival enlargement is often generalized but tends to be more pronounced in the anterior regions (95) making it more difficult to remove dental plaque effectively during tooth brushing.

Tooth loss and edentulism are the final stages of dental caries and periodontal disease. A nationwide population-based study in South Korea found that 9.5% of older adults were edentulous, rising to 18.1% among those aged 80 years and above (96). Meanwhile, the National Oral Health Survey of Adults (NOHSA) 2020 in Malaysia reported that only 34.3% of individuals aged 60 years and older retained 20 or more teeth (97). There is a positive relationship between tooth retention, overall health, and quality of life. Older adults with 20 or more teeth are less likely to experience poor health. Systematic reviews have also concluded that the risk of hypertension, cognitive impairment, and dementia increases with tooth loss (98,99). Having less than 20 teeth increases the likelihood for functional dependence and onset of disability, increase risk of CDs outcomes, nutrition and quality of life decline (100). Interestingly, active chewing has been linked to maintaining cognitive function in older adults (101). Hence, restoring masticatory function could be beneficial in preventing cognitive decline in the older population (102).

2.3 Oral mucosal lesions

Generally, oral lesions are more prevalent among older adults than in young adults (103,104). Studies shows that the oral lesions are associated with medicines, nutritional disorders, ill-fitting dental prostheses, systemic diseases and poor oral hygiene—all factors that are more prevalent in older populations (103,105–107). As people age, the stratified squamous epithelium becomes thinner, less elastic, and atrophies (108). A decrease in immunological responsiveness further increases susceptibility to infection and trauma. In addition, a higher incidence of oral and systemic disorders, coupled with greater medication use, may lead to oral mucosal disorders in older individuals (109,110).

Previous study by Cheruvathoor et.al., 2020 in Kerala, India found that prevalence of older adults having oral mucosal lesions was 59.6% with most common lesion group was red and white (73.2%), followed by pigmented (15.5%) (103). The most common diagnoses were oral lichenoid diseases such as oral lichen planus which may result from general medication intake, and lingual lesions (111). Additionally, potentially malignant lesions such as oral leukoplakia were significantly more often diagnosed in groups of younger seniors between the aged 60 and 70 years (111).

2.4 Oral candidiasis

Oral candidiasis, commonly known as "thrush," is an opportunistic fungal infection mainly *Candida*

albicans that primarily affect the oral mucosa (112). Predisposing factors for oral candidiasis can be categorized into systemic and local factors. Systemic factors include immunosuppressive therapies, chemoradiation, immunocompromising conditions such as Sjogren syndrome, endocrine disorders like diabetes, hypothyroidism, and nutritional deficiencies. Older patients with diabetes had 4.4 times higher estimated risk of developing oral candidiasis when compared with individuals without this condition (113). Whereas local factors such as salivary dysfunction, inadequate oral hygiene practices (e.g., poor denture care and prolonged wear), and the use of topical corticosteroid therapy can exacerbate the condition (112).

This review highlights that chronic diseases and geriatric syndromes in older adults present a complex challenge. Both conditions can lead to dependencies in ADLs and polypharmacy, ultimately worsening OH. In summary, the theoretical framework on the association of CDs, geriatric syndrome and their consequences on OH and bidirectional effect is as shown in Figure 2.

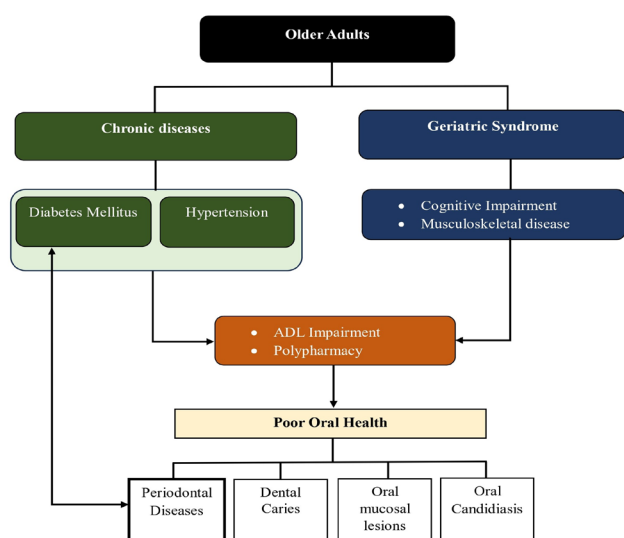


Figure 2: Theoretical framework on the association of chronic diseases, geriatric syndrome and their consequences on oral health and bidirectional effect

3. Barriers and challenges to oral health care

3.1 Barriers and challenges faced by older adults

A mini review concluded that there is significant evidence supporting the strong relationship between socioeconomic status (SES), healthcare access, and healthy ageing. Lower SES is often associated with greater barriers to access, leading to poorer health outcomes such as chronic pain, chronic medical conditions and depressive symptoms (114,115). However, despite being vulnerable to poor OH in older adults, the average time since their last dental visit was 15 months with emergency care accounted for the most (44%), while only 8% visits for dental check-ups (116). The perceived need for dental treatment such as negative attitude towards seeking treatment and lack of awareness in OH, difficulty in comprehending dentist explanations, long

appointments/waiting times, unavailability of weekend services, use of home remedies or self-care are others reported barriers and challenges (117–119).

3.2 Barriers and challenges faced by caregivers

Caregivers of older adults are essential, but they often face obstacles that affect both their well-being and their ability to provide quality care. A study conducted among healthcare personnel in nursing homes in Friesland, Netherlands, identified several key obstacles to providing effective oral care. These included residents' cooperation and behaviour, often complicated by cognitive impairments or dementia, which make OH care procedures more difficult (120,121). Additionally, the burden of caregiving is exacerbated by heavy workloads and limited time, as well as the perception that OH care is not an essential part of ADL. This mindset negatively impacts the quality of care provided to dependent older adults (120–122).

3.3 Challenges faced by oral health care providers

Providing dental care in domiciliary settings, particularly in long-term care facilities, is inherently complex. Challenges include inadequate equipment, infection control issues, and insufficient training especially among younger dentists (123). In Malaysia, only 36.1% of dentists have experience providing dental care for the older adults. This may be due to the complex medical histories of this population and the unfavorable working conditions in dental care services for older adults (124).

4. Strategies and recommendations for optimal oral health care

Given the shared modifiable risk factors between OH and noncommunicable diseases (e.g., smoking and diet) as well as social determinants, the WHO has recommended integrating age-related OH concerns into general healthcare. Such integration can foster the development of OH care for older adults, increase awareness of the importance of OH, and ultimately improve the quality of healthcare for the older population (125).

Integrated healthcare for older patients involves the coordination of services among various professionals across different care settings—such as long-term care facilities and home care—without necessitating the merging of structures. This collaborative approach ensures comprehensive care for older adults (126). For example, oral healthcare professionals can collaborate with medical colleagues to screen for and detect systemic disorders in older adults before they develop into serious medical issues. Anemia, for instance, may be present as pallor of the oral mucosa, loss of tongue papillae, or aphthous ulcers (127,128). Moreover, integrating dental and medical data can facilitate research on the prevalence and severity of oral and systemic diseases, as well as the effectiveness of interventions in older populations.

Enhancing Domiciliary Dental Care (DDC) can significantly improve access to dental services for the older population. However, this requires policy reforms and improvements in dental education, particularly in training dental students to competently treat older patients (129). Beyond focusing on dentists, it is also essential to train dental therapists to administer OH promotion programs. This would help alleviate the high workload of dentists. Such training should include educating staff on basic OH and diseases, managing oral and denture hygiene, providing dietary guidance, and offering post-treatment care for older patients (124).

Collaboration with healthcare personnel and caregivers is crucial for improving the OH of older population, especially in long-term care settings and homes. Many older adults with ADL are highly dependent on caregivers or family members for self-care, including OH care (130,131). Therefore, such collaboration enhances awareness of the importance of OH care in older population, improves OH knowledge and attitudes, boosts confidence in performing tasks, facilitates more effective management of care-resistant behaviors in older adults, and increases responsibility for OH care (132–134). Various methods, including lectures, live demonstrations of oral hygiene techniques, videos, and OH education, have proven effective in improving OH among older adults (135,136).

Strengthening DDC further requires addressing the lack of domiciliary equipment and unfavorable working conditions. This can be achieved through cost-sharing initiatives with other agencies, such as the welfare department, private nursing homes, and non-governmental organizations, to acquire the necessary equipment (124). Collaborations with nursing homes by establishing dedicated treatment areas, maintaining updated medical records, and designating points of contact for dental issues can also enhance DDC effectiveness (123). Additionally, an older-friendly transportation system is essential to enable older adults to fulfill basic needs, access healthcare, participate in social activities, and maintain autonomy. Such support could include private chauffeuring and companionship services tailored to meet their needs (137).

5. Study limitations

This narrative review is primarily constrained by the predominance of cross-sectional studies, which limit the ability to determine causality. The quality of evidence varies, and comparisons across studies are complicated by inconsistent definitions of "older adults," with some employing a threshold of 60 years and others using 65 years. Furthermore, most studies were conducted in institutional settings rather than community-based contexts, resulting in limited data regarding the OH of community-dwelling older adults.

CONCLUSION

In conclusion, although oral diseases are largely preventable, they remain prevalent among older adults—particularly those who are medically compromised, cognitively impaired, functionally disabled, or financially disadvantaged. These factors limit access to oral healthcare and ultimately diminish their quality of life. The strong connection between OH and overall health in older adults with chronic conditions highlights the need for comprehensive and integrated care. Overcoming barriers such as physical and cognitive impairments, financial constraints, and limited dental service access is essential. Incorporating oral healthcare into national health policies, improving coordination among healthcare settings (including home care), and training healthcare personnel and caregivers are critical steps. Moreover, future research should focus on developing interventions that enhance OH knowledge and self-efficacy among caregivers. By addressing these multifaceted needs, we can improve OH outcomes and contribute to a better quality of life for older adults.

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