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Mini Review

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Oral frailty and salivary aspects in older adults

Abstract

Introduction: oral frailty has emerged as an important clinical concern associated with reduced oral health behaviours, less oral care motivation, compromised quality of diet, chewing and swallowing thereby the whole health. Frailty is a complex syndrome involving the decline of multiple interrelated systems. With advancing age, physiological reserves gradually diminish, and the presence of frailty accelerates this decline, ultimately compromising homeostatic mechanisms. This landscape brings the tool OFI-8, a patient reported outcome measure developed with propose to measure the oral frailty risk. Saliva is one of its components and has very important role in the oral frailty with several aspects as hyposalivation, xerostomia and fluid quality.

Purpose: Observing the findings about risks in oral frailty and the role of salivary aspects. Keywords: oral frailty, saliva, older people.

Methods: Articles have been selected since 2020, published with contents about oral frailty and saliva, and 4 were elected to integrate this mini review. The searching was for the keyword's oral frailty and saliva, and only studies based on evidence.

Conclusion: Oral frailty and salivary aspects demonstrate a strong and consistent relationship in older adults.

Keywords: oral frailty, saliva, older adults

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Abbreviations: OFI-8, oral frail index-8; OFr, oral frailty; HR, hazard ratio; IC, confidence interval

Introduction

This article aims to establish a landscape about last researches and findings where there is correlation between saliva and oral fragility, once oral health is a part of an individual's general health status, and a multidisciplinary approach is needed to assess the contribution of oral health.[1] It is well known that aging leads to many modifications in oral cavity, among them anatomical and physiological changes and the correlation between these aging processes and the salivary aspects are too relevant. As the reduced salivation in users of complete dentures indicates a risk factor for developing stomatitis,[2] it also follows the oral fragility process. And this could result in worse conditions among older adults physically, psychologically and socially.[3]

Aging, social frailty, severe periodontitis and lack of teeth have consequences as decline in physical health and mental health, social withdrawal, lower quality of life and systemic frailty. The Oral Frailty Index-8 (OFI-8) is a patient-reported outcome measure developed in Japan to assess oral frailty risk and it was adopted, culturally and linguistically for English-speaking older adults in United States.[4] Oral Frailty (OFr) have been measured with six signs (dry mouth, food residue on oral surfaces, unclear speech, inability to keep mouth open, painfulness, diet of pureed or soft food) may be used to evaluate OFr syndrome and its severity was associated with diminished quality of life. OFr is related to Fried's frailty phenotype, general health, nutrition and need for help with daily activities. Hiltunen et al.,[5] and Vendola et al.,[6] showed frail older adults present poor oral hygiene and social drift away.

Studies have founded in the condition of oral frailty, a decline in oral function, which is related to physical function; thus, it bears a potential association with fall risks.[7] The connection between systemic health and oral health leads Liu et al.,[8] to strongly recommend incorporating oral frailty assessment into the routine evaluation items for hospitalized older adults' patients.

Oral frail index-8 (OFI-8)

The Oral Frailty Index-8 (OFI-8) was developed by Tanaka et al. in 2021[9] in Japan and it is validated in at least in more three other languages: Chinese, English and Portuguese. The OFI-8 assess older adults oral health through a questionnaire with binary scoring system (Table 1).

Table 1 Oral frail index-8 (OFI-8).

Oral frail index-8 (OFI-8)	
1)	Difficulty eating hard foods compared to six months ago;
2)	Occasional choking on tea or soup;
3)	Use of dentures;
4)	Symptoms of dry mouth;
5)	Reduced frequency of outings compared to six months ago;
6)	Ability to chew hard foods;
7)	Brushing teeth at least twice a day;
8)	Visiting a dentist at least once per year.

Scores range from 0 to 11, with higher scores indicating poorer oral health. A total score of ≥4 is indicative of oral frailty.

Saliva

The oral frailty is strongly associated with saliva, dry mouth is previously considered as a sign of OFr.[10] It is a sign of general fatigue, and it is associated with chewing and swallowing difficulties, dehydration, dementia, and unclear speech.[11] Lately the studies have shown significant associations between oral frailty indicators and inflammatory, oxidative stress, and endocrine biomarkers in saliva and blood.[12]

Population-based data further support the relationship between aging, hyposalivation, and xerostomia. In a representative cross-

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sectional study conducted in Hungary, slightly more than one-third of the examined population reported subjective oral dryness (xerostomia). Unstimulated whole saliva flow rate showed a significant negative correlation with age, with progressively lower flow values observed in older age groups. Importantly, as salivary flow decreased, the severity of xerostomia increased, indicating a close association between objective hyposalivation and subjective dry mouth complaints. As reduced salivary secretion occurred more frequently with advancing age, the prevalence and clinical impact of xerostomia were greater among older adults than in the general adult population, reinforcing aging as a key factor in the burden of dry mouth symptoms.[13] This study is cited on this introduction to illustrate population-level epidemiological evidence linking aging and xerostomia.

With advancing age, the structural composition of the major salivary glands undergoes progressive changes, characterized by an increased proportion of fat and fibrovascular tissue and a concomitant reduction in acinar volume. Histological analyses of human submandibular glands across a broad adult age range have revealed age-dependent atrophy affecting both acinar and ductal epithelia, along with alterations in fibrous and elastic tissues and in the walls of arteries and veins. Partial arterial occlusion and associated ischemic processes have been proposed as contributing factors to parenchymal atrophy. Collectively, these structural and vascular changes likely contribute to the reduced functional efficiency of salivary glands observed in older adults.[14] This classical histological reference is cited in the introduction to provide biological background and were not part of the literature search strategy used for article selection in this mini-review, as more recent studies specifically addressing these structural histological changes are scarce.

Recent evidence[15] suggests that reduced salivary flow is not solely a consequence of systemic diseases or medication use but is independently associated with aging itself. In a cross-sectional study evaluating adults aged 35 years and older, salivary flow was shown to decrease predictably with advancing age, at an estimated rate of 0.005 mL/min per year for both resting and stimulated salivary flow, regardless of the presence of type 2 diabetes mellitus, polypharmacy, or dietary fibber intake. This finding reinforces the concept that age-related changes in the salivary glands represent a physiological trajectory that may precede overt clinical manifestations of oral dysfunction, positioning saliva as an early marker within the continuum of oral frailty. Importantly, reduced resting salivary flow was associated with lower salivary pH values, indicating impairment of the chemical balance of saliva in the context of hyposalivation.

Within this context, the functional consequences of age-related salivary changes become clinically relevant. Reduced salivary flow, together with associated qualitative alterations, may contribute to oral discomfort, impairment of oral functions, increased susceptibility to oral infections, a higher risk of dental wear, and a negative impact on quality of life. These observations emphasize the importance of objective salivary flow assessment as part of early monitoring strategies in adults and older adults. Particularly within the framework of oral frailty, such assessments allow the identification of cumulative functional decline over time, rather than reliance on isolated symptoms, thereby improving risk stratification and clinical decision-making.[15]

The clinical implications of salivary dysfunction within this framework are further illustrated by restorative and tooth survival outcomes.[16] reported a substantial reduction in the survival of both restorations and teeth among patients with dry mouth. In a Finnish cohort comprising 71 individuals with dry mouth and 142 control patients, the survival of 3,208 restorations was analysed. Restorations in dry mouth patients exhibited a significantly higher risk of failure compared with controls (hazard ratio [HR] = 2.08; 95% CI: 1.65–2.63), and the risk of tooth extraction was also increased (HR = 1.98; 95% CI: 1.02–3.82). Although fixed prosthetic crowns demonstrated greater longevity than direct composite restorations, particularly large composites, overall restorative and tooth survival remained compromised in this group. Within the framework of oral frailty, these findings reinforce that salivary dysfunction extends beyond localized restorative outcomes, reflecting a broader functional vulnerability of the oral system that may accelerate cumulative oral decline and compromise long-term oral function.

Purpose

Observing the findings about risks in oral frailty and the role of salivary aspects

Methods

The concept of oral frailty is highly relevant in ageing and has been gaining prominence mainly after the pandemic period. Oral Frailty Index-8 may help to assess oral frailty risk among older adults and saliva is one of its components. In this way, only articles correlated with the selected search keywords were included, such as reviews, cross-sectional studies, meta-analyses, and cohort studies.

This mini review considers 10 articles selected since 2020 and used the main databases: Elsevier, Pubmed and Scholar Google, although there are still few publications with this correlated theme, which represents a limitation.

The articles inclusion criteria were studies involving older adults and the searches use the follow keywords: oral frailty and saliva. Only four studies have shown this relationship in greater depth (Table 2).

Table 2 Characteristics and main findings of studies on oral frailty in older adults

Study (Author, year)	Main findings
Tanaka et al. (2021)[9]	*2,011 individuals (51% women; mean age, 73.0 ± 5.5 years) participated in the 2012 baseline survey (last follow-up wave 2018 *OFI-8 may help identify individuals at risk of oral frailty and functional disability.
Saito et al. (2021)[17]	*4765 community-dwelling individuals aged 75 and 80 years *Oral health factors related to oral function appear to be associated with mortality risk and an accumulation of oral health factors increases mortality risk among older people.
Cha et al. (2025)[18]	*606 adults aged 65 years and older *Oral frailty and nutritional status demonstrated a direct association. Poor oral health conditions, including pain, infection, and tooth loss, can substantially impact food intake and this can adversely affect teeth, periodontal tissues, and salivary glands, aggravating oral discomfort. Systemic diseases associated with malnutrition often present with oral symptoms, exacerbating the risk of oral frailty.
Tabata et al. (2025)[19]	*Outpatients (n = 120) who underwent diagnostic tests for oral hypofunction were enrolled. The survey items encompassed age, sex, oral hypofunction test results and the OFI-8 score. *The OFI-8 is useful for screening oral hypofunction, exhibiting considerable potential effectiveness in detecting oral dryness, occlusal, masticatory and swallowing dysfunctions.

Citation: Vendola MCC, Aguiar MC. Oral frailty and salivary aspects in older adults. *J Dent Health Oral Disord Ther.* 2026;17(2):56–59.
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Discussion

The studies of oral frailty take in account the salivary aspects, as dry mouth and the great challenge will be interlaced and find where or when the aging per si promotes less saliva.

Saito et al conducted a study with 4765 community-dwelling older adults, associated with mortality risk and an accumulation of oral health factors increases mortality risk among older people. And it takes us to understand how is needed to care about the oral health and its factor associated like saliva.

Tanaka et al.,[19] created the Ofi 8 based in several parts which are connected with oral frailty, and one of them is the saliva, oral dryness an even the chocking on tea or soup, they are directly associated with use of dentures as well swallowing and chewing. Studies have shown that salivary glands factors are also affected for the aging and oral frailty process how was demonstrate by Kim et al.[12]

Second Tabata et al.,[19] the OfI-8 test is too useful and presents potential effectiveness in detecting oral dryness, occlusal, masticatory and swallowing dysfunction.

Based on the evidence discussed above, the salivary aspects are consistently incorporated within the criteria used to evaluate oral frailty. Through the reviewed studies, saliva is not approached as an isolated parameter, but rather as an integral component of the functional, behavioural, and clinical domains that characterize oral frailty. Indicators such as dry mouth, impaired chewing and swallowing, prosthetic dependence, and reduced oral hygiene practices inherently reflect alterations in salivary quantity and quality. Certainly, the salivary dysfunctions play a very important role in increasing the risks associated with oral frailty, warranting further-in-depth studies to explore this direct relationship in older adults' population.

In this context, current evidence supports a close and consistent relationship between oral frailty and salivary alterations in older adults. Reduced salivary flow and xerostomia emerge reflecting both physiological aging of the salivary glands and cumulative oral and systemic vulnerability. These changes are associated with impairments in oral function, nutritional status, quality of life, and overall health. By integrating salivary symptoms with functional and behavioural dimensions of oral health, instruments such as the Oral Frailty Index-8 support the inclusion of salivary assessment in oral frailty screening, contributing to earlier detection, improved risk stratification, and more effective preventive strategies in aging populations.

The correlation between oral frailty and saliva should be further explored in the coming times, with new scientific evidence and clarify the true role of saliva in the oral frailty. The studies above provide points to both hyposalivation and xerostomia, or alterations in the salivary glands, and they contribute to the near future knowing whether and how consider saliva as a marker of oral frailty.

An important conceptual point emerging from the available evidence concerns the role of salivary dysfunction within the oral frailty framework. Current studies do not yet allow a definitive conclusion as to whether salivary dysfunction should be interpreted primarily as a determinant of oral frailty or rather as a clinical marker reflecting broader functional decline. On one hand, reductions in salivary flow may directly contribute to impairments in chewing, swallowing, oral lubrication, and mucosal protection, suggesting a potential causal contribution to the development of oral frailty. On the other hand, salivary alterations may also represent a downstream manifestation of systemic aging processes, multimorbidity, polypharmacy, and nutritional changes that accompany frailty. Within this perspective, salivary dysfunction may function both as an early marker of oral functional decline and as a contributing factor that amplifies the progression of oral frailty.

Some limitations of the current evidence should also be acknowledged. Most of the available studies are cross-sectional in design, which limits the ability to establish causal relationships between salivary dysfunction and oral frailty. In addition, the number of studies directly examining salivary parameters within the oral frailty framework remains limited, and methodological heterogeneity exists regarding the assessment of salivary flow, xerostomia, and oral frailty indicators. Differences in study populations, age ranges, and clinical settings further complicate direct comparisons across studies. Consequently, longitudinal and mechanistic investigations are still needed to clarify the temporal relationship between salivary alterations and the development or progression of oral frailty.

Conclusion

Oral frailty and salivary aspects demonstrate a strong and consistent relationship in older adults. Salivary dysfunction, particularly reduced salivary flow and xerostomia, represents a relevant component within the set of clinical and functional indicators used to identify oral frailty risks.

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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