

Evidence-based conceptual pathway of oral function decline

Ageing is a major health issue being confronted simultaneously by all nations of the world. This problem is now affecting not only high-income countries but also in middle- and low-income countries. Extension of life expectancy represents a celebrated achievement of a goal that humans have long desired, but at the same time it poses a monumental challenge. With age, an individual becomes more susceptible to disease, and this leads to a decline in the functions of life (intrinsic capacity and functional ability).

The 2015 World Report on Ageing and Health defines the goal of healthy ageing as helping people to develop and maintain the functional ability that enables well-being¹⁾. Functional ability is defined as the “health-related attributes that enable people to be and to do what they have reason to value”. Functional ability consists of the intrinsic capacity of the individual, the environment of the individual and the interactions between them. Intrinsic capacity is “the composite of all the physical and mental capacities that an individual can draw on”. In order to delay functional decline and support people’s health and well-being, it will be necessary not only to provide medical care and long-term care insurance for all, but also to integrate these care systems into a larger social infrastructure that promotes healthy behavior and removes barriers.

Oral functions such as eating, talking and smiling are essential life functions that are deeply dependent on oral health²⁾. As such, access to oral health care must be recognized as a fundamental and universal human right. To that end, communities and governments have an obligation to maintain a health care system in which all persons can access the education, prevention, treatment and care necessary to maintain oral health throughout the life course.

Oral function is a complex, multifaceted system of interacting parts and movements. It consists of several higher-order functions essential to daily living and survival such as eating, talking and smiling. These functions are supported by a number of lower-order (physiological) components: teeth, saliva, lips, tongue and oral-facial muscles. As people age, they experience a changing oral environment accompanied by a decline in oral functions including motor function (lips and tongue movement), masticatory function and swallowing function. In Figure 1, I propose a novel conceptual pathway of the complex array of factors related to oral function decline. This visual representation places oral function in the center and depicts the various factors that contribute to and are affected by it. The main risk factors that directly cause oral function decline are oral diseases and symptoms such as caries, periodontal disease, tooth loss, and pain. However, this conceptual pathway shows that a variety of other factors related to general health and well-being also contribute to oral function decline. The figure also reflects the growing recognition that there are complex reciprocal relationships between the various factors and oral function. Furthermore, the three central components of the pathway (oral diseases, oral functions, and systemic health) are themselves in a state of interaction with larger social and biological factors such as socioeconomic status, behavior, psychosocial status, and environment (including health services). All of this occurs in the context of and as an integral part of the ageing process.

The relationship between ageing and oral function decline, as well as the effect of oral function decline on systemic health, are supported by empirical evidence. For example, the proportion of community-dwelling independent older people in Japan at risk of dysphagia is reported to be 25.1%³⁾. The decline in oral function that occurs during aging reduces the diversity of food intake, resulting in insufficient nutrients and leading to nutritional impairment. In addition, a large-scale longitudinal study of elderly people living in Japan has shown that minor oral dysfunction increases the risk of sarcopenia, dependence on long-term care and

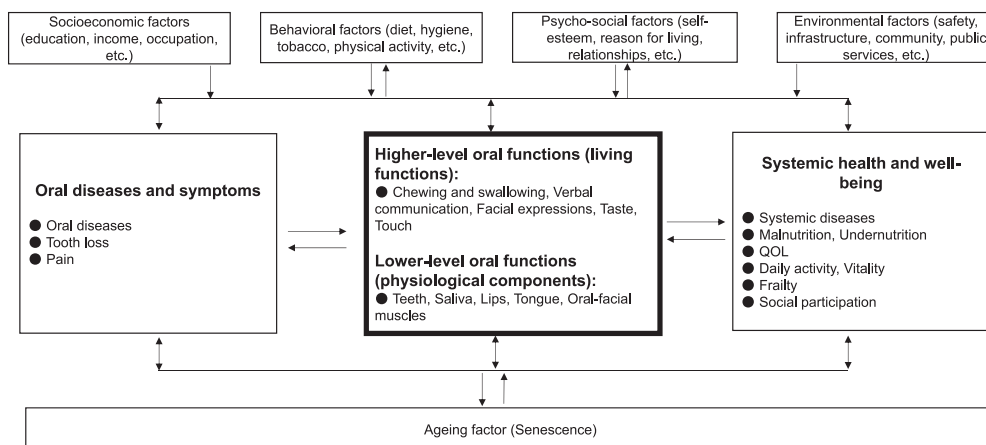


Figure 1. Conceptual pathway of oral function decline

death⁴⁾.

With an eye to preventing oral function decline, the Japanese Geriatric Dental Association has already proposed an oral function assessment (screening) program that would expand traditional dental assessment, attempting to measure even slight decreases in components of oral function such as tongue function, lip function, saliva production, and eating and swallowing functions^{5, 6)}. These assessments still require improvement, particularly in terms of reliability and validity, but it is clear that person-centered assessment of oral function in conjunction with multi-sectorial correspondence based on such assessments are essential approaches for maintaining oral health in the later stages of life.

The oral function improvement interventions that would accompany such screening programs can take a number of different forms, many of which have already been researched. Such interventions may include: health education (e.g., the role of the oral cavity, the role of saliva, how to prevent aspiration pneumonia); oral hygiene guidance; oral function maintenance exercises (e.g., facial and tongue exercises, saliva gland massage, pronunciation practice, breathing training)⁷⁻⁹⁾. These interventions can be performed by a wide variety of healthcare professionals, including dental hygienists.

The number of research reports on the effects of interventions designed to improve the oral function of community-residing elderly persons is increasing. However, there have not yet been any systematic reviews or meta-analyses of this body of research, so a strong claim of the effectiveness of such interventions cannot yet be made¹⁰⁾.

Healthy longevity and health equity are the right goals, and they resonate with people in all walks of life and of all races and cultures. They therefore have the potential to unite humanity across our multitudinous divisions. The factors contributing to healthy longevity are numerous, complex, and interrelated, requiring creative, interdisciplinary, intergenerational and global approaches. Prevention of oral function decline is an important part of that picture, and person-centered approaches such as community-based, multi-sectorial screening programs are practical, effective, and pose a low economic burden on society.

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