ADDITIONAL FILE 1

Justification for included independent variables/covariates

Dentate status

Caries and periodontal diseases are the primary reasons for tooth loss [1, 2], leading to changes of normal physiology, impaired chewing functions, and nutritional problems [3]. Being without teeth decreases regeneration and resistance of oral tissues and impairs protective function of the oral mucosa [3]. Wearing partial removable dentures increases risk for plaque, gingivitis, and caries [4], and removable prostheses are predictors for multiple tooth loss in older adults [5]. Denture use is also associated with inflammatory oral mucosal disorders and traumatic ulcers [3]. Hence tooth loss is related to significantly decreased oral-health-related quality of life [6, 7].

Dementia

Persons with dementia have generally poorer oral health compared to the general population, including higher rates of dental cries, edentulism, and periodontal diseases [8]. Lacking self-care abilities including carrying out oral hygiene care, difficulties in wearing dentures, and poor oral hygiene are the assumed causes of poor oral health in persons with dementia. Care providers often lack training in proper oral health care as well as in managing residents with responsive behaviors, and they often lack awareness of the importance of appropriate oral hygiene [8]. In addition there is emerging evidence that poor oral health is also a risk factor for dementia [9]. The inflammatory processes that go along with periodontal diseases may be an important factor contributing to
impaired cognition, and masticatory inefficiencies caused by tooth loss may lead to
dietary deficiencies associated with cognitive impairment.

Oral hygiene
Poor oral hygiene is a major risk factor for tooth loss as well as periodontal diseases,
and maintaining good oral hygiene helps retaining teeth and preventing oral
inflammatory processes [1, 2].

Age
One of the strongest risk factors for poor oral health is old age – partly due to physical
changes, but primarily due to frailty, multiple chronic diseases increasing self-care
deficiencies, and higher barriers to accessing professional dental services [10, 11].

Sex
Women have generally poorer oral health than men, due to biologic reasons (different
salivary composition and flow rate, hormonal fluctuations, genetic variations), cultural
factors (social roles), different barriers in accessing dental services, and dietary
variations [12-14].

Physical functioning
Higher dependency levels in carrying out basic activities of daily living (including
performing oral hygiene) is associated with poor oral health [8, 15].
Responsive behaviors

One of the major barriers nursing home care providers encounter when providing oral health care to residents is residents’ responsive behaviors [8, 16-18]. Those behaviors may include refusing to open their mouth, turning away their head, verbally assaulting the caregiver, spitting at or hitting the caregiver. Responsive behaviors are associated with poor oral health [8, 9].

Depression

O’Neil et al. [19] found an independent, positive association between the number of oral/dental problems and the likelihood of having depression.
References