

Swallowing Difficulties, Oral Symptoms, and Nutrition in Long-Term Care Elderly Residents – A Secondary Publication

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Abstract: Oral health is often impaired in people living in residential care. In older people, poor oral health is associated with functional deficits, multiple sclerosis, and memory disorders. Keeping one's teeth healthy throughout life would promote both oral health and general health. Biting and swallowing problems in older people are also linked to oral health, limiting eating activities and requiring diet changes to softer foods that are easy to chew and swallow. This may limit dietary diversity and adequate nutrient intake. Although eating-related chewing and swallowing problems are common in institutionalized residents, they are often addressed too late, when the resident is already malnourished. Nutrition in nursing and retirement homes has been the subject of various studies since the 2000s. However, studies on swallowing and chewing difficulties are scarce and their link to adequate nutrient intake has received lesser attention^[6,7].

Keywords: BCG intravesical instillation therapy; Urine treatment; Isopropanol

Online publication: March 29, 2024

1. Research and methodology

The prevalence of dysphagia in elderly residents of service and nursing homes and its relationship with the residents' characteristics, nutritional status, and nutritional care were investigated. The prevalence of factors associated with binge eating problems, the nutritional status and dietary intake of residents and their relationship with swallowing difficulties and dental health were also investigated. The distribution of chewing and swallowing problems and the frequent occurrence of oral health problems in combination revealed a cluster of problems (the simultaneous occurrence of problems in residents) and their relationship with the residents' characteristics, well-being, and nutritional status. In addition, the association between swallowing difficulties and oral problems and the mortality of residents was also studied.

This study consisted of two datasets: a dataset collected in 2007 from all residents of service homes in Helsinki and Espoo, of which 66% participated ($n = 1466$) (Study I), and a dataset collected in 2011 ($n = 3123$), in which 70% of all residents of service homes in Helsinki participated (Study IV). Data on the residents' background information and medical conditions were collected through a structured questionnaire. Their

nutritional status was assessed using the mini nutritional assessment (MNA) test. In addition, in 2007, data on residents' dietary intake was collected through food diaries ($n = 343$) (studies II and III). The residents' nutrient intake was compared with the Finnish dietary recommendations. Data on illnesses, medications, functional capacity, cognition, and eating habits were collected, as well as the caregivers' assessment of the residents' oral problems related to chewing and swallowing difficulties. Mortality data were obtained from the central register (studies I, II, and IV). Study IV used the same structured questionnaires as in the previous sub-studies and included questions on the resident's well-being. Study IV examined the cluster of problems described by the Venn diagram: the co-occurrence of problems with chewing, swallowing, and dry mouth and their relationship with the above variables, as well as with the resident's psychological well-being and mortality.

2. Results

2.1. Prevalence of swallowing difficulties, association with general health, and nutritional status

Swallowing difficulties were present in 12%–14% of residents in the 2007 sub-study and 18% of residents in the 2011 study. Swallowing difficulties were more common in women and in residents who had been institutionalized for a longer period. Residents who had difficulty swallowing were at higher risk of Parkinson's disease, chronic obstructive pulmonary disease (COPD), and stroke. Swallowing difficulties were also associated with impaired cognition and an increased need for assistance. Dysphagia and malnutrition also predicted higher mortality at one and three-year follow-ups.

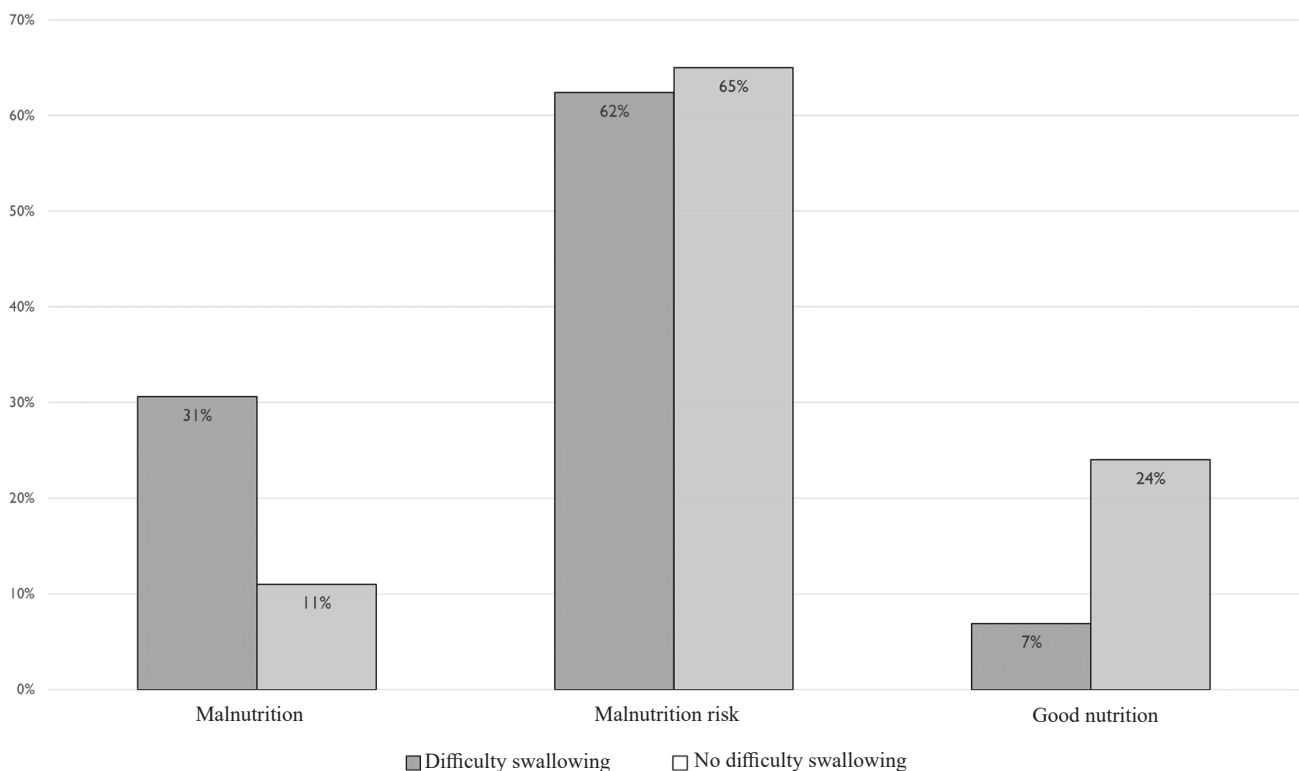


Figure 1. Swallowing difficulties and nutritional status according to MNA classification

The nutritional status was assessed using the MNA test, which classifies nutritional status into malnutrition, malnutrition risk, and good nutrition. Almost all (93%) of the residents with swallowing difficulties were either

malnourished or at risk of malnutrition, compared to the control group (76%) (no swallowing difficulties) (Figure 1). Similarly, the body mass index (BMI) was lower in residents with swallowing difficulties. They also ate liquid or pureed food and often ate in lesser amounts.

2.2. Dental and nutritional status

The average age of the residents in Study III ($n = 343$) was 83 years and 82% of them were women. More than half of the participants had a low level of education and poor cognition (82%), and most also needed help with daily activities. Based on dental status, the residents were divided into three groups. The first group included residents who had lost all their teeth but did not wear dentures ($n = 28$, 8%). The second group included residents who had no teeth but wore full dentures in the upper and/or lower jaw ($n = 134$, 39%). The third group included residents who had their own teeth with or without dentures ($n = 181$, 53%). Almost half (47%) had lost all their teeth, and 17% of them did not use dentures at all. Toothlessness was associated with low educational attainment, impaired cognition, and a greater need for assistance with daily activities. They also had the most difficulty swallowing.

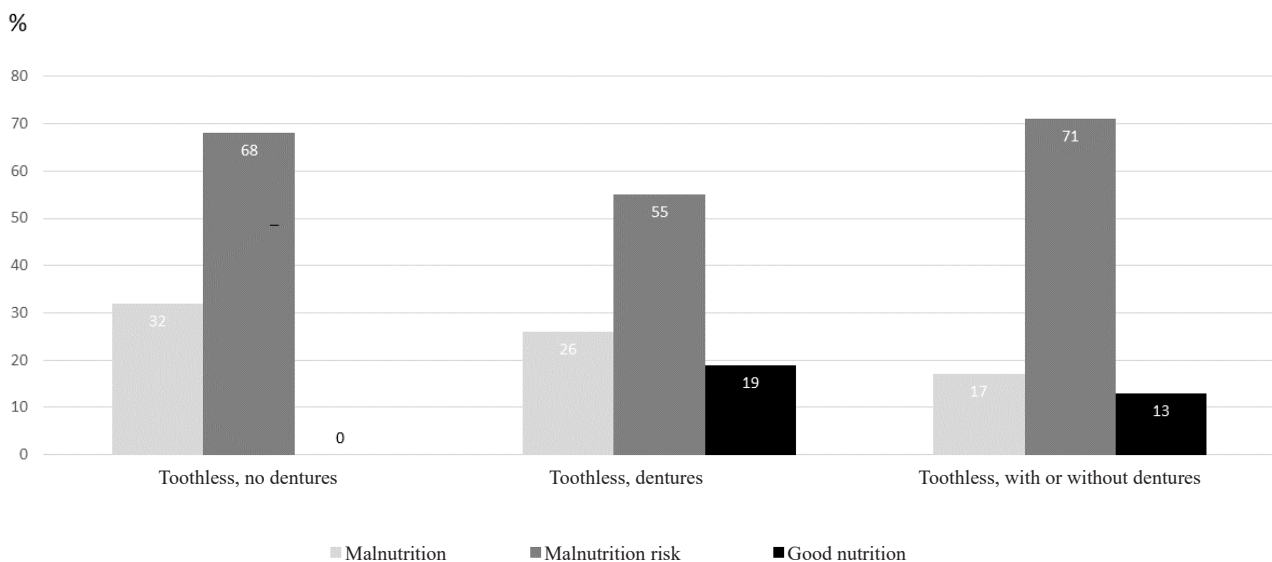


Figure 2. Dental status and nutritional status according to MNA classification

Nutritional status was also associated with dental health (Figure 2). The worst nutritional status was among residents with no teeth and no dentures, where more than a third of them were malnourished, and about two-thirds were at risk of malnutrition. None of them had good nutritional status. Those without teeth but with dentures were in better nutritional status, with 20% in good nutritional status, but more than half at risk of malnutrition and a quarter in malnutrition. Residents who still had their teeth (17%), with or without dentures (32%), were less malnourished than the other groups (26%). However, a smaller proportion of residents with their teeth were in good nutritional status (13%) than those without dentures (19%).

2.3. Dental health and adequate intake of nutrients

Nutrient intakes were compared based on the Finnish dietary recommendations in groups according to dental status. Almost 60% of the subjects received enough energy to meet the recommendations. Energy adequacy did not vary by dental status, but protein intake was associated with dental status. The average daily protein intake (g/weight kg/day) was lowest in residents without teeth and highest in residents with or without dentures.

Adequate protein intake varied significantly between groups. Only just over a third of residents without dentures, more than 40% of those with dentures, and 60% of residents with dentures received adequate protein. Inadequate vitamin intake was common and did not differ significantly between groups. Moreso, only less than a third of those studied received the recommended levels of essential vitamins.

2.4. Swallowing difficulties and nutrient intake

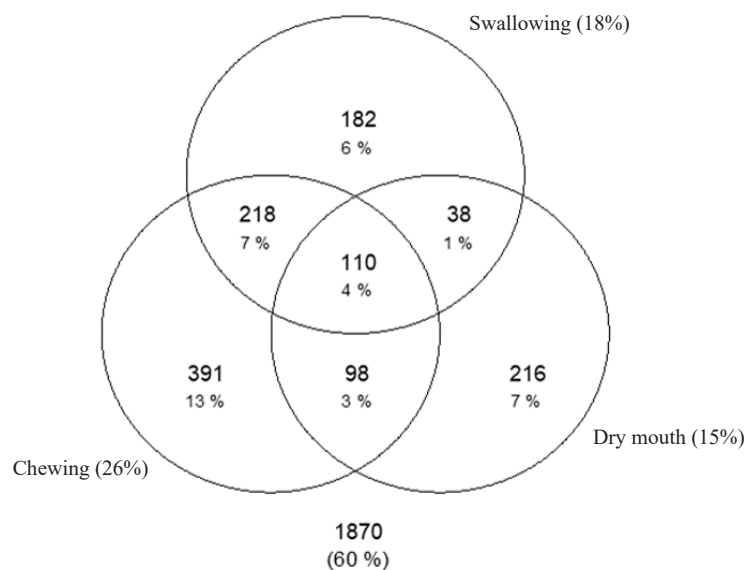
Nutrient intake was assessed based on food diaries of volunteer residents classified by swallowing difficulties ($n = 345$). Nutrient intake was compared with the Finnish dietary recommendations in the groups with and without swallowing difficulties. More than half of all subjects had insufficient energy intake. Adequate energy intake was not associated with the occurrence of swallowing difficulties. Almost 60% of residents with swallowing difficulties and 81% of residents without swallowing difficulties had insufficient protein intake. Almost all residents with swallowing difficulties received protein-enriched food or supplements. Despite the attention paid to the low protein intake, more than half of them were still receiving too little protein. Vitamin and mineral intake did not differ between the groups. More than half of all those studied were getting too little vitamin A, D, E, folic acid, iron, and fiber.

2.5. Oral symptoms and their association with nutrition, well-being, and mortality

A 2011 study ($n = 3123$) investigated the prevalence of overlapping problems (swallowing difficulties, chewing problems, and dry mouth) and their association with the resident’s nutritional status, well-being, and mortality.

Venn Diagram

N = 3123



17 Mar 2017

% of total

File: ()

Figure 3. Oral symptom cluster: co-occurrence of chewing and swallowing difficulties and dry mouth

The overlap of oral symptoms was illustrated by a Venn diagram (**Figure 3**). 40% of residents had at least one of the following symptoms: dry mouth (15%, $n = 462$), difficulty chewing (26%, $n = 817$), and difficulty swallowing (18%, $n = 548$).

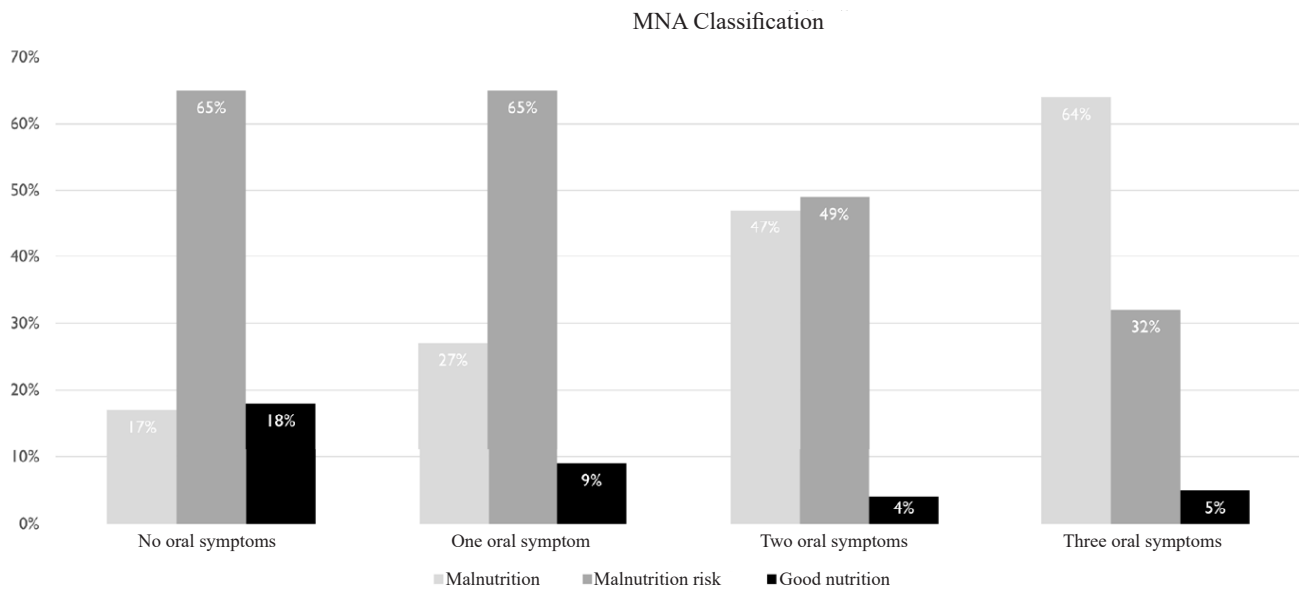


Figure 4. Prevalence of oral symptoms and nutritional status

Swallowing difficulties, chewing problems, and dry mouth were more frequent and co-occurring in elderly residents without teeth who did not use dentures or only used full dentures in the upper or lower jaw. The number of malnourished patients increased and the number of well-nourished patients decreased with the increase in concomitant oral symptoms (**Figure 4**). The pattern of oral symptoms was associated with older age, Parkinson’s disease, stroke, cognitive decline, poorer mobility, increased need for assistance, poorer self-rated health, poorer well-being, and increased mortality.

3. Conclusion

Chewing problems and swallowing difficulties are often associated with malnutrition, mortality, and poor protein intake. A cluster of oral problems was associated with more severe malnutrition, poorer self-rated health and well-being, and increased mortality. These problems need to be addressed in the development of nutritional care for the elderly. The oral health of adults should receive earlier attention and more public dental services should be provided to improve the chances of the elderly to maintain their dental health and function throughout their lives. It is estimated that around two out of five elderly residents of a nursing home in Helsinki in 2011 had lost all their teeth.

Disclosure statement

The author declares no conflict of interest.

References

- [1] Lindroos E, Saarela RKT, Soini H, et al., 2014, Caregiver-reported Swallowing Difficulties, Malnutrition, and Mortality Among Older People in Assisted Living Facilities. *J Nutr Health Aging*, 18: 718–722.
- [2] Lindroos E, Jyväkorpi S, Soini H, et al., 2017, Swallowing Difficulty and Nutrient Intakes Among Residents in

Assisted Living Facilities in Helsinki. *EurGeriatr Med*, 208(3): 228–33.

- [3] Saarela RKT, Lindroos E, Soini H, et al., 2016, Dentition, Nutritional Status, and Adequacy of Dietary Intake Among Older Residents in Assisted Living Facilities. *Gerodontology*, 33: 225–232.
- [4] Lindroos EK, Saarela RKT, Suominen MH, et al., 2019, Burden of Oral Symptoms and Its Association with Nutrition, Well-Being, and Survival Among Nursing Home Residents. *J Am Med Dir Assoc*, 20: 537–543.
- [5] Lindroos EK, Swallowing Difficulties, Oral Symptoms, and Nutrition in Elderly People Living in Long-Term Care Facilities, thesis, University of Helsinki, Finland.
- [6] Soini H, Muurinen S, Routasalo P, et al., 2006, Oral and Nutritional Status – Is the MNA A Useful Tool for Dental Clinics. *J Nutr Health Aging*, 10(6): 495–459.
- [7] Suominen M, Muurinen S, Routasalo P, et al., 2005, Malnutrition and Related Factors Among Elderly Residents in All Nursing Homes in Helsinki. *Eur J Clin Nutr*, 59(4): 578–583.

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