



Review

Literature review: prevention of aspiration in the elderly overseas

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Abstract

Objective: This review seeks to identify trends and issues in preventing aspiration for the elderly overseas in the hopes of gathering information regarding how a similar level of care may be provided in Japan.

Materials and Methods: The authors used the CHINAL Ultimate database to review academic publications from December 2012 to December 2022. Four terms, one from each of four sets of keywords, were combined as search criteria: (1) “dysphagia”, “aspiration”, “choking”, “airway obstruction asphyxia”, “swallowing function”, or “pneumonia”, (2) “aged” or “elderly people”, (3) “nursing” or “nursing care”, and (4) prevention. Papers that did not directly relate to the purpose of this review were excluded.

Results: The authors identified fourteen publications regarding preventative care for aspiration in the elderly. According to the reports, preventative care mainly consisted of ensuring proper oral care, screening to assess swallowing function, and taking steps at meals to prevent aspiration.

Conclusion: Our research showed that the primary ways of preventing aspiration in the elderly overseas included (1) screening for oral conditions and swallowing function to prevent pneumonia and (2) providing proper oral care coupled with support during meals.

Key words: dysphagia, elderly people, nursing, prevention

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Introduction

Japan has experienced an increasing number of deaths from aspiration as its population has aged, making it imperative to provide the elderly with better preventative care for aspiration. Japan reportedly has the highest number of choking-related deaths per 100,000 people of any nation studied¹⁾. This review therefore seeks to identify trends and issues in preventing aspiration among the elderly overseas in the hopes of gathering information regarding how a similar level of care may be provided in Japan.

Materials and Methods

Literature selection

The authors used the CHINAL Ultimate literature database to search for sources regarding preventative care for aspiration in the elderly published between December 2012 and December 2022. Four terms, one from each of four sets of keywords, were combined as search criteria: (1) “dysphagia”, “aspiration”, “choking”, “airway obstruction asphyxia”, “swallowing function”, or “pneumonia”, (2) “aged” or “elderly people”, (3) “nursing” or “nursing care”, and (4) prevention.

Analysis

The identified sources were carefully studied from the perspective of preventing aspiration in the elderly, and relevant passages were collected. The authors then created a list of authors, publication years, research designs, target countries, objectives, and research outcomes.

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Results

Literature review

The search returned 133 sources. Twelve did not have abstracts and were excluded, as were sources that were not relevant to research on preventing aspiration in the elderly. This process yielded fourteen sources for the literature review (Figure 1).

Trends in research on preventing aspiration in the elderly

Three target articles were published prior to 2015, and eleven were published from 2016 onward (Figure 2).

In terms of research design, ten of the fourteen reviewed articles were quantitative studies, one was a qualitative

study, two were literature reviews, and one was a literature review combined with case studies (Table 1)²⁻¹⁵. As shown in Table 1, the regions and countries in which the studies were done were the United States (4), Japan (3), France (2), Canada (2), the Netherlands (1), China (1), and England (1). Notably, almost all of the countries were developed nations.

Studies were primarily performed at senior care facilities or hospitals. According to the reports, preventative care mainly consisted of ensuring proper oral care, screening to assess swallowing function, and taking steps at meals to prevent aspiration, in addition to setting up collaborative frameworks across multiple professions (Table 2).

Ensuring proper oral care

Evidence shows that oral care with tongue cleaning, or

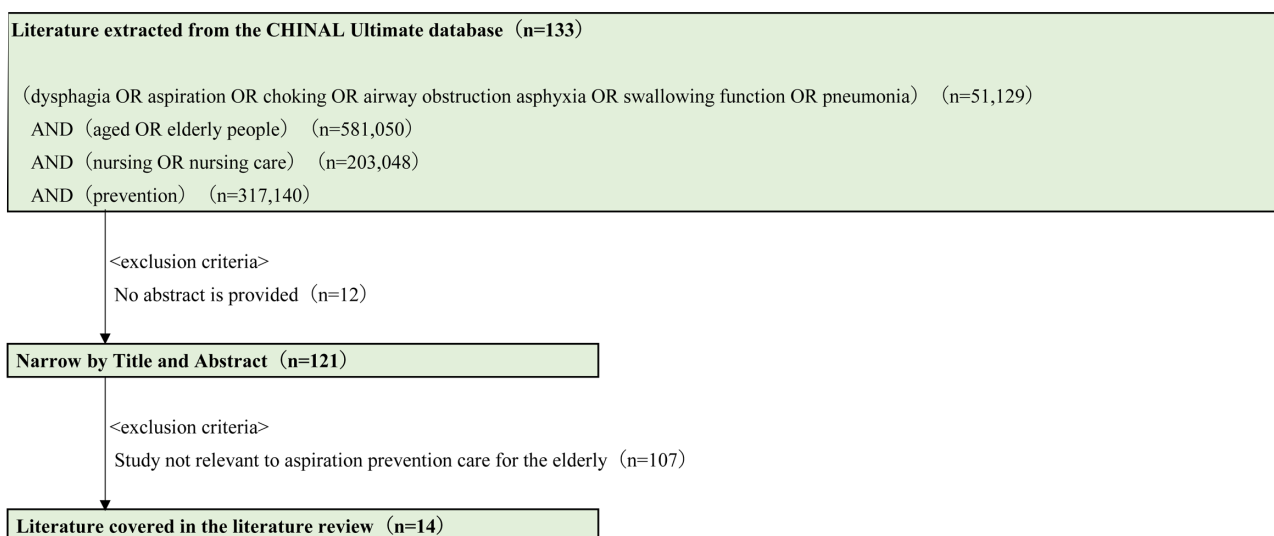


Figure 1 Flow chart of study selection. The search returned 133 sources. Twelve did not have abstracts and were excluded, as were sources that were not relevant to research on preventing aspiration in the elderly. This process yielded fourteen sources for the literature review.

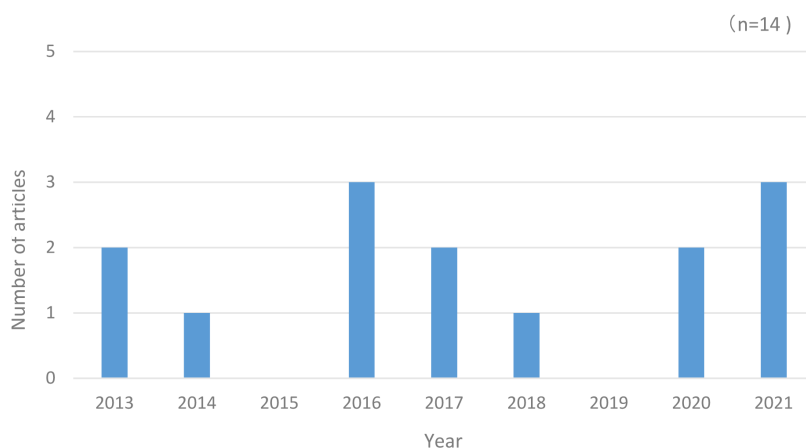


Figure 2 Target articles by year. Three target articles were published prior to 2015, and eleven were published from 2016 onward.

a combination of oral wiping and administering oral nutrition supplements (ONS), may be effective as a prophylactic intervention against aspiration pneumonia^{5, 7}. In addition, studies show that the availability of effective products and supplies facilitates the provision of oral care⁶.

In many facilities, nurses require knowledge of the health benefits of oral care and skills related to assessing and approaching oral care⁶. Nurses are in a unique position to impact the oral health outcomes of their patients, but they must know how to intervene to make a significant difference¹. In addition, clarity around the concept of oral hygiene as a nursing intervention could prevent systemic diseases in older patients, further demonstrating the importance of oral care¹. At the same time, individuals with dysphagia who reside in nursing homes are likely to receive inadequate oral hygiene owing to the absence of mouth care protocols⁸.

Screening to assess swallowing function

Screening for oropharyngeal dysphagia (OD) may minimize the risk of aspiration and OD-related pneumonia². However, another study reported that nursing-initiated screening for OD did not decrease the rates of hospital-acquired aspiration pneumonia (HAAP) in an acute oncology hospital¹⁰.

Taking steps at meals to prevent aspiration

Modification of diet was the most frequently used intervention to prevent or reduce aspiration¹⁴. Another study

cited the importance of using swallowing protocols to avoid preventable aspiration among hospitalized patients receiving acute care and deemed at risk².

Collaborative frameworks across multiple job descriptions

Many of the oral care interventions, such as oral hygiene, positioning, feeding strategies, swallowing rehabilitation, environmental changes, and quality of life considerations, are performed by the nurse, and collaboration between the nursing and speech and language therapy teams is essential⁹. Improvements in oral care at nursing homes in the United States suggest that the presence and support of dedicated oral care aides may be required¹¹. Nevertheless, professional interventions provided by speech and language therapists are still limited in nursing home settings. Modification of diet was the most frequently used intervention to prevent or reduce aspiration; however, multidisciplinary interventions were far superior for the management of aspiration¹⁴.

Educational programs

Repeated training to improve (1) the quality of care in the field of oral health and nutrition and (2) staff knowledge in nursing homes may be an effective means of improving the quality of care at these facilities³. Another source reported the need to incorporate multidisciplinary collaboration as part of nursing student education to promote oral

Table 1 Research overview

No	Author	Study design	Country or region	Target audience
1	Coke <i>et al.</i> ²	The concept analysis	Canada	-
2	Warner <i>et al.</i> ³	Prospective, blinded, referral-based.	USA	52 registered nurses and 101 inpatients
3	Poisson <i>et al.</i> ⁴	Cross-sectional surveys before/after intervention	France	Staff, director, and medical practitioners for nutritional and oral care in nursing home
4	Hoogendijk <i>et al.</i> ⁵	Observational cohort study	France	Nursing home 716 residents
5	Izumi <i>et al.</i> ⁶	Randomised controlled trial	Japan	114 residents of 11 group homes and private nursing homes
6	Coker <i>et al.</i> ⁷	Design a qualitative, exploratory multiple-case study	Canada	25 nurses working on 5 inpatient units at different hospitals
7	Higashiguchi <i>et al.</i> ⁸	Prospective observational study	Japan	252 patients in 75 nursing homes, rehabilitation hospitals, and other care facilities
8	Jablonski <i>et al.</i> ⁹	Proof of concept study	USA	Individuals with dysphagia who reside in nursing homes
9	Atkinson <i>et al.</i> ¹⁰	Case study and scoping review	England	-
10	Ebersole <i>et al.</i> ¹¹	Quantitative research	USA	All patients admitted to the hospital during January 2014–December 2015
11	Zimmerman <i>et al.</i> ¹²	Cluster randomized trial	USA	2,152 residents from 14 paired nursing homes
12	Wijnen <i>et al.</i> ¹³	Retrospective cohort study	The Netherlands	Patients with hip fracture on this ward between November 2014 and July 2015, aged 70 years and older
13	Haresaku <i>et al.</i> ¹⁴	Quantitative research	Japan	119 nursing students
14	Chen <i>et al.</i> ¹⁵	Scoping review	China	-

In terms of research design, of the fourteen articles reviewed, ten of the fourteen reviewed articles were quantitative studies, one was a qualitative study, two were literature reviews, and one was a literature review combined with case studies.

Table 2 Research objectives and results

No	Research objectives	Research results
1	The aim of this concept analysis is to clarify the concept of oral hygiene care as it is provided by nurses to dependent older persons in institutional settings who do not rely on mechanical ventilation and are not undergoing chemotherapy or radiotherapy.	Clarity around the concept of oral hygiene care as a nursing intervention could enable nurses to impact oral health outcomes and possibly prevent systemic diseases in older patients. Nurses are in a position to make an impact on oral health outcomes of their patients, but they need to know how to intervene to make a difference.
2	(1) To describe the results of a web-based teaching module used by registered nurses to identify patients at risk of aspiration and (2) to determine accuracy of the registered nurse-administered 3-ounce water swallow challenge protocol, that is, drinking three ounces of water, a basic cognitive screen and oral mechanism evaluation, when compared with blinded ratings from speech-language pathology.	Results confirm the reliability and accuracy of a registered nurse-administered Yale swallow protocol. The consequence of 98% accuracy combined with previously reported 96.5% sensitivity, 97.9% negative predictive value and <2% false negative rate allowed for adoption of the protocol for the entire general hospital population. Relevance to clinical practice Avoidance of preventable prandial pulmonary aspiration as a cause of nosocomial infection is an important goal for all acute care hospitalised patients deemed at risk of aspiration.
3	To assess the impact of a nutrition and oral care training program on nursing home (NH) policies and residents.	In conclusion, the NABUCCOD training program has shown at the resident level, an improvement in quality of care in the field of oral health and nutrition in NHs related to improvement of staff knowledge, but low rate of changes were observed within institution policies. Repetition of these trainings may amplify these improvements.
4	The aim of this study was to examine adverse effects of pneumonia events on physical functioning in nursing home residents.	The results of this study show that pneumonia events are very frequent in the nursing home. They are responsible for functional loss in residents, even in a population characterized by low levels of physical functioning prior to the onset of pneumonia. These findings strongly support the importance of developing and implementing preventive strategies aimed at reducing pneumonia in this setting.
5	The aim of this randomised controlled trial was to examine whether oral care with tongue cleaning improves coughing ability in elderly individuals living in geriatric care facilities.	An increase in PEF was noted as result of oral care with tongue cleaning in this study, suggesting improved coughing ability. Oral care incorporating tongue cleaning will become an important component of aspiration pneumonia prevention.
6	The purpose of the study was to explore how nurses provide bedtime oral hygiene care for hospitalised older people in post-acute hospital settings.	Oral hygiene care is discretionary and often missed care. Implications for practice Nurses need knowledge of the health benefits of oral care, and skills related to assessment and approaches to oral care. Availability of effective products and supplies facilitates provision of oral care. The evidence for oral hygiene care practices, outcomes of nurse-administered oral care and nursing's role in influencing the oral health literacy of patients require further study.
7	Evaluate the efficacy of a new oral care intervention: wiping plus oral nutritional supplements (ONS)	The present study suggests that a combination of oral wiping and administering ONS may be effective as a prophylactic intervention against aspiration pneumonia. The dissemination of wiping plus ONS could prevent the onset or worsening of pneumonia not only in elderly patients with underlying disease but also in elderly people in general (because they are often affected by pre-malnutrition owing to lifestyle choices) and those with sarcopenia. This intervention could reduce the mortality rate from aspiration pneumonia among the elderly.
8	The purpose of the current study was to determine (a) the safety of a mouth care protocol tailored for individuals with dysphagia residing in nursing homes without access to suction equipment, and (b) the feasibility of collecting oral and fecal samples for microbiota analyses.	Individuals with dysphagia who reside in nursing homes are likely to receive inadequate oral hygiene due to the absence of tested and evidence-based mouth care protocols. They are at high risk for poor oral health, which is exacerbated by the lack of dental services and dental insurance from either Medicare or Medicaid. From a policy perspective, the combination of absent evidence-based mouth care protocols coupled with insufficient dental coverage create a pool of individuals at great risk for preventable infectious illnesses that contribute to high health care costs.
9	Explore the benefits and risks of thickener and a range of less well-known interventions.	Many of these interventions, such as oral hygiene, positioning, feeding strategies, swallowing rehabilitation, environmental changes, and quality of life considerations, are performed by the nurse, and collaboration between the nurse and the SLT team is essential. The nursing team should reflect these guidelines in their daily care into their day-to-day care. Doing so will ensure holistic, safe, and individualized care.

Table 2 Continued

No	Research objectives	Research results
10	The primary aim of this study was to determine whether a nursing-administered aspiration screening protocol at a NCI-designated comprehensive cancer hospital would lead to a reduction in the rate of hospital-acquired aspiration pneumonia (HAAP).	Nursing-initiated dysphagia screening did not decrease HAAP rates in an acute oncology hospital. Dysphagia-related aspiration accounts for only a small proportion of HAAP in a setting where instrumental swallow testing is already well-integrated into care for patients at high risk for OPD. In fact, aspiration associated with GI dysfunction accounted for the majority of HAAP, suggesting a need for improved methods of preventing frank aspiration of intestinal contents.
11	To evaluate the effectiveness of Mouth Care Without a Battle, a program that increases staff knowledge and attitudes regarding oral hygiene, changes mouth care, and improves oral hygiene, in reducing the incidence of pneumonia among NH residents.	This matched-pairs cluster randomized trial of a mouth care program compared with standard care was not effective in reducing pneumonia incidence at 2 years, although reduction was found during the first year. The lack of significant results in the second year may be associated with sustainability. Improving mouth care in US NHs may require the presence and support of dedicated oral care aides.
12	The aim of this study was to determine whether the introduction of oropharyngeal dysphagia (OD) screening by nurses improved recognition of patients at risk for OD as compared with a historical control group with usual care. In addition, we assumed that an improved recognition of OD risk would result in an increase in the number of diet modifications and referrals to a speech–language pathologist.	In conclusion, the introduction of SSA after hip fracture surgery induced greater recognition of increased risk of OD and more dietary modifications. SSA is easy to implement and can be performed quickly by trained nurses. Screening for OD may minimize the risk of aspiration and OD-related pneumonia. It can minimize the risk of pneumonia in these frail patients.
13	The purpose of this study was to investigate the effect of this education on perceptions and awareness toward oral health care among the nursings.	The result of this study showed that multiinter professional education might be an effective means to improve nursing students perceptions and awareness toward oral health care. Therefore, oral health professionals should support and participate in these educational initiatives to promote collaborative oral health care for patients and older adults in nursing homes and communities.
14	Describe the current spread of interventions to prevent or reduce aspiration in older adults with dysphagia with a specific focus on those who reside in nursing homes.	The majority of the included studies were conducted in developed countries or regions. The review provides a useful overview of interventions that have been used in nursing or residential facilities with older people who suffer from dysphagia, but the dearth of evidence from low to middle income countries is noticeable. Professional interventions provided by speech and language therapists are still limited in the setting of nursing homes. Modification of diet was the most frequently used intervention to prevent or reduce aspiration, however, multi-disciplinary interventions were far better for aspiration management.

According to the reports, preventative care mainly consisted of ensuring proper oral care, screening to assess swallowing function, and taking steps at meals to prevent aspiration, in addition to and setting up collaborative frameworks across multiple professions.

care among patients and the elderly¹³).

Future prospects

One source cited the importance of developing and implementing preventative strategies aimed at reducing pneumonia in nursing homes⁴.

Discussion

Oral care is recognized as a critical means of promoting both oral and overall health, particularly among the elderly¹⁴). However, oral care is likely not being implemented sufficiently in many countries and regions.

Several studies reported the implementation of proper

oral care and tools to deliver oral care as a means of preventing aspiration pneumonia^{5–7}). Because nursing homes lack oral care protocols, oral hygiene at these facilities is likely to be lacking⁸). Professional interventions from speech and language therapists are still limited¹⁴), which may represent an area for future investigation.

Evidence has shown that screenings may minimize the risk of pneumonia¹²); however, nursing-initiated screening for OD did not decrease the rates of HAAP in an acute oncology hospital¹⁰). Problems with the screening tools and/or methods may be the underlying cause of this issue.

Although modification of diet was reported as the most frequently used intervention to prevent or reduce aspiration¹⁴), the relevant study did not give any specific details

concerning this practice.

Systems for multidisciplinary collaboration are also important. More than one country has cited nurses as the key to promoting oral care^{1, 6)}, but this requires collaboration with speech and language therapists as well as other professionals who can support good oral hygiene practices¹¹⁾.

In terms of educational programs, repeated staff training on oral health and nutrition may be needed³⁾. Nursing student education also needs to incorporate multidisciplinary collaboration to promote oral care among patients and the elderly¹³⁾. Because nurses will likely be the key players in the future of oral care among the elderly, implementing this education as soon as possible may be more effective in raising awareness.

Conclusion

The authors conducted a literature review regarding preventative care for aspiration in the elderly overseas, identifying and analyzing fourteen sources from the existing literature. The majority of these studies were conducted in developed nations.

The review revealed that the primary methods of preventing aspiration in the elderly overseas included (1) screening for oral conditions and swallowing function to prevent pneumonia and (2) providing proper oral care coupled with

support during meals. In terms of future development, the studies cited a need for intervention from those performing other duties as well as support from specialized oral care assistants. Some studies also reported the implementation of training programs for staff and nursing students to promote oral care in the elderly.

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