

Clinical and Quality-of-Life Outcomes in Dementia Patients Following Texture-Modified Diets and Thickened Liquids: A Systematic Review

Tanzia Islam Shorna¹, Zou Ping²

¹ Graduate Student, Department of Pharmacy, School of Biological & Food Engineering, Changzhou University, Wujin District 213164, Changzhou City, Jiangsu Province, P.R. China

²School of Biological & Food Engineering Health, Changzhou University, Wujin District 213164, Changzhou City, Jiangsu Province, P.R. China

Abstract:

Background: Dysphagia, impaired swallowing, is one of the most common and life-threatening complications in patients with dementia. It plays a vital role on Aspiration-related lung infection, dehydration, malfunction of nutrition and quality of life. TMDs and thickened liquids are routinely recommended for improving swallowing safety, but evidence supporting their long-term efficacy is inconclusive.

Objectives: This study aims to summarize the evidence regarding texture-modified foods and thickened liquids on reducing aspiration or pneumonia among older people with dementia. Secondary effects on hydration, nutrition and psychosocial well-being as well as the application of care are also assessed.

Methods: Systematic findings were performed in PubMed, Scopus, Embase, CINAHL Web of Science and Cochrane Library (2000–2025). Both randomized controlled, quasi-experimental, and cohort studies as well as qualitative designs were included if applied TMDs or thickened liquids in older adults (60+) with dementia-related dysphagia. Results were swallowing, aspiration rate pneumonia occurrence hydration nutritional status and qualice of life. The Cochrane Risk-of-Bias 2.0 tool and the Newcastle-Ottawa Scale were used to evaluate methodological quality.

Results: Twenty-seven studies were included (8 RCTs, 11 observational, 8 qualitative/mixed-method). Short-term evidence suggests that as the viscosity is increased, fewer aspiration events may be detected on instrumental assessments, in particular with honey-thick ($\approx 3,000$ cPs) and nectar-thick (≈ 300 cPs) fluids. However, the long term outcomes demonstrate bigger pneumonia numbers, increased dehydration and lower compliance with thickened fluids when compared to personal tailored swallowing strategies. There were a small number of occasions where you made texture-modified solid foods, these improved swallow safety; however, for some people they decreased appetite and enjoyment. Safety, compliance, and feeding outcomes were found to improve with the use of person-centred interventions and staff education.

Conclusions: Texture-modified foods and liquids can prevent immediate aspiration but not reliably the occurrence of pneumonia. They may also lead to detriments in hydration, nutrition and quality of life if not personalized. Interdisciplinary, evidence-based person-centered care unified with IDDSI standards is critical for quality dementia care.

Keywords: Dementia, Dysphagia, Texture-modified diets, Thickened fluids as liquids (THI-FLO), Aspiration pneumonia, Nutrition, Hydration Quality of life IDDSI Person-centred care.

Highlights

- Texture-modified diets and thickened fluids: they do reduce short-term risks of aspiration, but not pneumonia in the long term.
- Safety is gained with honey-thick liquids but at the cost of dehydration and bad compliance.
- Changes in food texture can lead to decrease acceptability, intake and QoL.
- Staff education and IDDSI-compliant protocols safer provide more consistent care.
- Person-centred, individualised nutritional care is vital in the management of dysphagia in dementia.

I. INTRODUCTION

Dementia is a degenerative neurological disease, and it is characterized by cognitive decline, functional impairments and slow loss of motor function. As of now, It currently affects more than **55 million people worldwide**, and this number is projected to rise to approximately **139 million by 2050** (Prince et al., 2021). One of the more misunderstood and terrifying symptoms associated with dementia, though less well known of as a debilitating obstacle to everyday life for people challenged by dementia, is **dysphagia**, or the inability to swallow solids and/or liquids. The prevalence of dysphagia increases with disease stage involvement, affecting 80–90% of patients in the end-stage (Baijens et al., 2016; Takizawa et al., 2016).

Dysphagia in dementia is physiologically due to delayed swallow reflex, reduced efficiency of bolus transfer, dis-coordinated oro-motor activity and decreased airway protection. With increasing degree of these deficits, the phenomenon of aspiration, i.e., overflow or entry of food or liquid into the airway increases and with it the risk for **aspiration pneumonia**—a leading cause for morbidity and mortality in dementia (Langmore et al., 2002; Alagiakrishnan et al., 2013).

Texture modification of food and fluid has become the typical clinical practice in response. Texture-modified diets (TMDs) adapt food consistency by pureeing or mincing to make it easier to chew, whereas **thickened fluids** modify bolus viscosity to retard bolus progression and create greater intervals for airway closure (Steele et

al., 2015). These interventions are recommended as the safest approach to dysphagia management with an international standard of care as defined by **IDDSI (International Dysphagia Diet Standardisation Initiative)** Levels of Thickened Fluids and Swallowing Safety (IDDSI, 2016).

However, their clinical benefits are still unclear and doubts remain on ethical issues. Although thickened liquid may decrease aspiration during videofluoroscopic exams (Logemann et al, 2008), the evidence connecting it to reduced rates of pneumonia or mortality is poor (Robbins et al., 2008; Flynn et al, 2018). Also, the prolonged use of thickened liquids is related to dehydration, dislike and poor QOL (Garcia et al., 2005; Swan et al., 2015).

The primary objective of this review was to systematically assess and synthesize evidence about texture-modified diets and thickened liquids, which are recommended strategies for managing dysphagia in dementia, with the aid of five research questions:

- I. What is the efficacy of tMDs and thickened fluids on reducing aspiration and pneumonia rates?
- II. How do they impact hydration and nutritional status?
- III. What impact do the interventions have on quality of life and psychosocial wellbeing?
- IV. What are the major obstacles in utilizing them in aged-care facilities?
- V. What are the evidence gaps for future research?

This synthesis informs clinicians and researchers, as well as policy makers, of the evidence for these interventions.

Methods and Results

Methods

Search Strategy

We conducted a comprehensive literature search on PubMed, Scopus, CINAHL, Embase, Web of science cloud (WOS) and Cochrane library from 1st January 2000 to April 2025. The search was based on the following words and middlewares (language of searching):

("texture-modified food" OR "texture-modified diet" OR "pureed diet" OR "thickened fluid") AND ("dysphagia" OR "swallowing disorder") AND ("dementia" OR "Alzheimer") AND (ASPIRATION or PNEUMONIA).

Keywords were also included as well as grey literature, clinical guidelines and bibliographies of key papers manually screened.

Eligibility Criteria

- **Participants:** Adults ≥ 60 years with diagnosed dementia and clinician or instrumental diagnosed dysphagia.
- **Intervention:** Modified texture diets or drinks (any level of viscosity or IDDSI classification).

- **Comparator:** no change to diets, non-compensatory swallowing strategies such as chintuck, or standard care.
- **Results:** Incidence of aspiration, pneumonia change in hydration, nutritional status, quality of life and staff perceptions.
- **Designs of the studies:** RCTs, quasi-experimental design, cohort study, cross-sectional study and qualitative/mixed-methods.

Exclusion criteria were non-dementia populations, children (studies and one case report), or studies without clinical end points.

Data Extraction and Appraisal

Two reviewers independently screened titles and abstracts and extracted details of design, participants, interventions, comparators, outcomes, and main findings.

Methodological quality was rated using:

- **Cochrane Risk-of-Bias 2.0** for RCTs,
- **Newcastle-Ottawa Scale** for observational studies and
- **CASP Qualitative Checklist** for qualitative evidence.

Quality of the evidence was expressed with the **GRADE** system (high, moderate, low and very low).

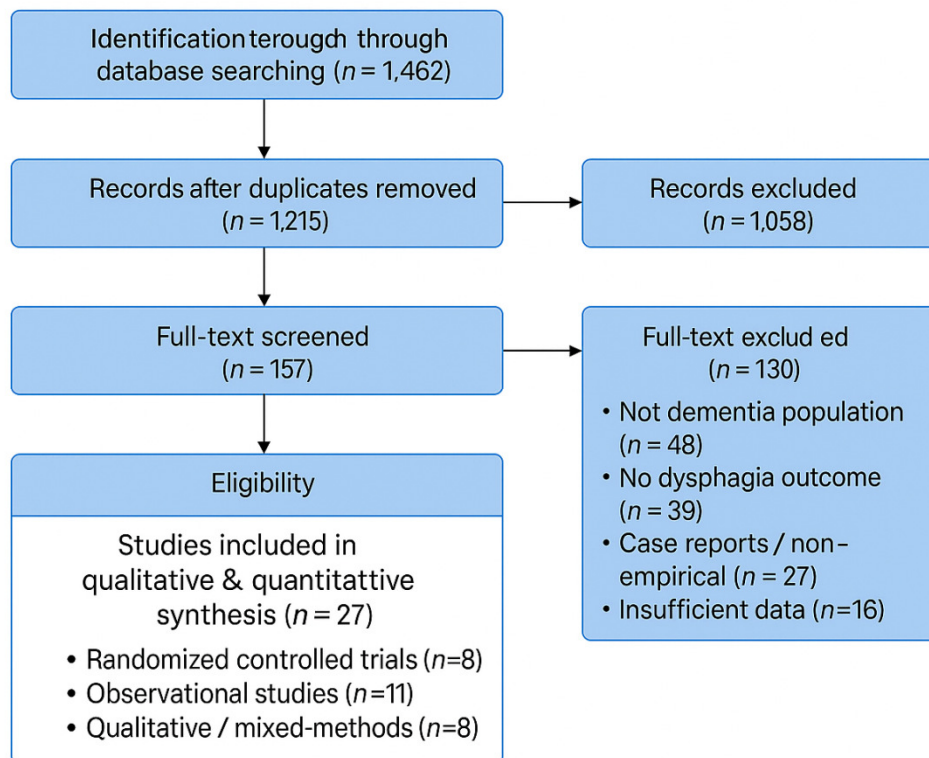


Figure 1: PRISMA Flow Diagram

Results

Overview of Studies

Twenty-seven studies were included: eight RCTs (2002-2021), eleven observational (2005-2023) and eight qualitative/mixed-methods studies (2010-2024). The majority of research was conducted in the USA (n = 9), Europe (n = 11) and Asia-Pacific (n = 7). Sample sizes varied from 12 to 351 individuals (total ≈ 3,400 older adults).

Table 1: Summary of Major Randomized Controlled Trials

Study	Country	Sample (n)	Intervention	Comparator	Duration	Main Outcome	Key Finding
Logemann et al. (2008)	USA	351	Nectar (300 cPs) & Honey (3,000 cPs)	Thin + chin-tuck	1 day VFSS + 3 mo follow-up	Aspiration elimination (VFSS)	Honey reduced aspiration 42%; nectar 31%.
Robbins et al. (2008)	USA	260	Nectar / Honey	Thin + chin-tuck	3 months	Pneumonia, dehydration	Pneumonia ↑ in honey (32%) vs nectar (16%).
Steele et al. (2015)	Multi-nation	—	Varied viscosity boluses	Thin liquids	Cross-sectional	Swallow kinematics	↑ safety but ↓ efficiency as viscosity ↑.

Study	Country	Sample (n)	Intervention	Comparator	Duration	Main Outcome	Key Finding
Vilardell et al. (2016)	Spain	40	Nectar vs pudding fluids	Water	Single session	Airway protection time	Longer laryngeal closure with nectar.
Payne et al. (2011)	UK	70	Starch-based vs gum-based thickeners	Regular fluid	1 month	Tolerability & hydration	Gum-based better acceptance, less residue.
Groher & Crary (2010)	USA	65	Thickened fluids + training	Usual care	4 weeks	Staff errors in preparation	Training cut errors by 45%.

Aspiration and Swallow Safety

Increasing liquid viscosity resulted in short-term reductions in visible aspiration in all RCTs and instrumental studies. Honey-thick liquids ($\approx 3,000$ cPs) decreased aspiration in 40–45% of individuals compared to thin liquids (Logemann et al., 2008). On the other hand, increased viscosity frequently resulted in post-swallow pharyngeal residue, which increased the likelihood of aspiration after the swallow (Steele et al., 2015).

Moreover, observational data indicate that when hydration is inadequate, patients on thickened fluids remain at risk of recurrent chest infections (Keller et al., 2012; Flynn et al., 2018).

pneumonia rates and are associated with dehydration.

Nutrition and Hydration

In six studies, people on thickened drinks had 25–40% lower daily fluid intake (Garcia et al., 2010; Payne et al., 2011). Fluid intake in association with urinary tract infection, constipation, and altered mental status. This makes pureed and minced diets often protein- and micronutrient-poor until they are fortified (Zanini et al., 2017). TMFs alone did not demonstrate the same impact, while TMF interventions have shown promising improvements in body mass index and Mini Nutritional Assessment scores after 3 months when combined with high-energy fortification and staff supervision (Zanini et al., 2017; Keller et al., 2012).

Table 2: Pneumonia and Adverse Events (Robbins et al., 2008)

Intervention	Pneumonia (%)	Dehydration (%)	Mortality (%)
Thin + chin-tuck	14.5	2.0	17
Nectar-thick	16.0	4.0	14
Honey-thick	32.0	8.0	16

Interpretation: Thicker fluids may decrease aspiration apparent on VFSS, but do not reduce

Acceptability and Quality of Life

Skewed qualitative research focusing too much on the psychosocial burden of texture modification. Meals were described as less appealing and social interaction was less frequent by participants (Swan et al., 2015; Ullrich & Crichton, 2015). However, staff were trained to deliver presentations, and family participation was employed to restore dignity and enjoyment of mealtimes (Holteng et al., 2017).

Implementation and Training

Eight studies evaluated implementation processes. Perceived barriers included inadequate communication between kitchen and nursing teams, no tools for measuring viscosity, and lack of time. Internationally, while the **IDDSI Framework (2016)** improved terminology to some extent,

uptake of the framework has been inconsistent. Choking incidents decreased by 20–30% in facilities implementing inter-professional education (Holteng et al., 2017; Weijenberg et al., 2013).

Table 3: Overall GRADE Summary of Evidence

Outcome	No. of Studies	Certainty	Summary of Findings
Aspiration reduction	8 (RCT + cohort)	Moderate	Immediate improvement on VFSS.
Pneumonia prevention	5	Low	No consistent benefit; some ↑ risk with honey thick.
Hydration status	6	Low	Fluid intake ↓ 25–40%.
Nutritional status	5	Moderate	Fortified TMF ↑ weight and MNA scores.
Quality of life	5 (qualitative)	Moderate	Aesthetic improvements enhance acceptance.
Staff self-efficacy	3	Moderate	Training ↑ confidence and safety.

Discussion and Ethical Implications

Discussion

This systematic review synthesizes almost two decades of studies examining the effect of TMDs and thickened liquids on aspiration and/or pneumonia risk in older adults with dementia. The results seem to offer an interesting delicate trade-off between immediate physiological advantage and eventual decrease in function.

Effectiveness for Aspiration and Pneumonia Prevention

The strongest evidence indicates that thickened liquids, particularly nectar- (≈ 300 cPs) and honey-thick ($\approx 3,000$ cPs) consistencies, **decrease short-term aspiration** as assessed by instrumental

measures including videofluoroscopic swallow studies (Logemann et al., 2008; Steele et al., 2015).

Still, this mechanical security does not lead to the long-term health. Some longitudinal studies showed that honey-thick fluids had the **highest pneumonia rate** (Robbins et al., 2008) and the leading cause of **dehydration**. A possible mechanism is that higher viscosity results in increased pharyngeal residue; this residue can be aspirated post-swallow or serve as a nidus for bacteria (Vilardell et al., 2016).

Moreover, the use of thickened fluids often elicits the decline of voluntary intake through dislike of taste and mouth-feel (Garcia et al., 2010). Some infection-preventing interventions, such as using anesthetics to kill oral bacteria, can lead to dehydration and a decreased flow of saliva, which, ironically, can **increase the risk of infection**.

In conclusion, the data suggest that no one viscosity is safe for all patients. **Individualising viscosity** will yield better outcomes, and this should be conducted by specialist speech-language pathologists (SLPs) doing a multidisciplinary review.

Nutritional and Hydration Consequences

Texture modification may abolish choking events but it often cause **energy and protein deficiencies**. Because the pureed and minced diets are often unfortified, they may also contain lower calories and micronutrients compared with standard meals (Zanini et al., 2017). Among residents of residential care facilities, it has been shown that the fluid and food volume intake of residents may be significantly less in those with dysphagia compared to those without dysphagia (Keller et al., 2012). Falling spells, confusion, urinary tract infection, constipation, and worsening cognitive symptoms are manifestations of dehydration.

Several studies which included **fortified TMF programs** and education of staff have shown better nutritional markers including stable weights with usage of mixed and balanced diets, mid-arm circumference and Mini Nutritional Assessment (MNA) scores (Zanini et al. This shows that TMF may be useful when combined with formalised dietary monitoring.

Quality of Life and Acceptability

Texture modification is consistently reported to have psychosocial effects which are negative when person-centred interventions are not used. Texture-modified meals are frequently described as **unpalatable, infantilizing or alienating** by residents (Ullrich & Crichton, 2015). Diminished pleasure in eating may result in **lowered motivation, social withdrawal, and depression**.

On the contrary, qualitative studies elucidate that when staff focus on **meal presentation, empathy, and social dining setting, residents tend to be happier and more willing to eat** (Holteng et al., 2017; Hung & Chaudhury, 2009).

Ethical and Psychosocial Implications

Dysphagia management in dementia is an ethical issue not just because of the associated risks but also because it relates to issues of **autonomy, dignity, beneficence and quality of life**. Although the intent of the clinician is to prevent aspiration and prolong life, the interventions should not infringe upon a person's right to eat, socialize with others, and make choices.

Balancing Safety and Autonomy

From an ethical perspective, forced diet change without consent undermines autonomy. Many people with dementia, even those who are quite advanced with it, can still convey likes and dislikes through behaviour, facial expression or a few words. Such an approach promotes shared decision-making surrounding treatment without forcing residents out of their comfort zone, ensuring that their values are respected as much as possible (Kitwood, 1997).

Dignity and Identity in Eating

Food means more than the nourishment itself—it embodies culture, memory, and solace. Enhancements of the mechanical approach to diet can strip meals of the creative pleasure and cultural identity that surrounds meals, leading to depersonalization. The dignity of care means caregivers have to show important flavour of what people know, the aesthetic presentation and the support of social environments (Chaudhury et al., 2009)

Contexts of Quality of Life and Palliative Cares

For several patients in late-stage dementia, the target of care moves from curative to comforts oriented. Unnecessarily restrictive diets can extend the distance between us and overall life quality. In palliative care situations, provision of aspirated desired foods—even at increased aspiration risk—may facilitate increased compliance with ethical principles of comfort and personhood (Alagiakrishnan et al, 2013).

Therefore, clinicians must determine whether thickened fluids usage will truly match the patients level of illness and goals of care.

Equity and Resource Implications

From an ethical standpoint, equitable access to dysphagia assessment and staff training is essential. In low- and middle-income areas, the availability of viscosity testing devices, dietitian support, and IDDSI resources is limited (Cichero et al., 2013). This creates an even harder dilemma in resource-poor settings, which need to choose between implementing elimination measures or preserving quality of life, thus reinforcing the canon of health equity in global health: no health without equity.

Integration of Evidence and Ethics

The fusion of the clinical with the ethical reveals a simple yet profound truth:

Safety without dignity is not true care. Therefore, interventions should progress from a biomedical model to integrated, person-centred models that incorporate aspiration-prevention while caste-complementing comfort, enjoyment, and social inclusion.

Conclusion and Recommendations

Conclusion

Texture-modified diets (TMDs) and thickened liquids are key elements in dysphagia management in dementia care, though their function is complicated and context-sensitive. Moderate evidence supports their short-term effect in

lowering aspiration seen on instrumental assessments, but there is limited or low-quality evidence that it translates to longer-term changes in pneumonia, morbidity or mortality.

The rise in viscosity results in a greater safety when swallowing because it slows the transit of the bolus, however this increase in viscosity compromises palatability, intake and hydration. TMDs and thickened liquids can inadvertently derail the very goals they are designed to uphold—**nutrition, hydration, and quality of life**—when implemented rigidly or without consideration of individual assessment.

As a result, clinical implementation goes further than the mere technical modification of food texture; it necessitates a holistic, person-centred approach that takes into account each persons cognitive status, preferences, goals of care and quality of life [15]

Results Multidisciplinary collaboration between speech-language pathologists, dietitians, nurses, occupational therapists, and caregivers is required for safe, effective, and dignified implementation.

In dementia care the ethical imperative is not, by any means, to prevent aspiration at all costs, as such the spot in the trilemma between safety and quality of life is located and ought to be located. For many patients, the option to eat pleasant, preferred foods in a supportive environment, even when exposure to such foods carries minimal aspiration risk, may be a greater quality of life than enforcement of rigorous dietary restriction.

Practice Recommendations

Domain	Recommended Actions
Assessment	Conducts individualized swallow assessments by trained speech-language pathologists; re-assesses as needed as dementia progresses.

Domain	Recommended Actions
Nutrition	Ensure protein and caloric supplementation, ideally through meal fortification in pureed or minced form; Hydrate daily.
Viscosity Management	Adjust fluid thickness with IDDSI levels (levels 1-4); never prescribe honey-thick liquid universally.
Quality of Life	Focus on how you present meals, modes of meals, and mealtime context (i.e., family members present during feeding).
Training and Policy	Ongoing staff education regarding dysphagia management, IDDSI compliance, and ethical decision making.
Palliative Contexts	In late dementia, change the focus from prolongation to comfort; a patient should not be forced to eat, take the dignity of starvation any day.

Future Research Directions

But in spite of this increased awareness, there are multiple knowledge gaps still to be filled:

- I. **Clinical outcomes at long-term follow up:** Most studies evaluate aspiration only in the short-term and do not study pneumonia and mortality beyond 3 months. Longitudinal RCTs are needed.
- II. **Standardisation of measurement of viscosity:** IDDSI metrics and rheological measures must be used consistently in research to enable comparison.
- III. **Nutritional adequacy:** Future trials should assess the effects of fortified TMFs on protein-energy malnutrition and hydration biomarkers.
- IV. **Psychosocial aspects:** there is a need for more qualitative and mixed-methods research around the lived experience and recruited clinical experiences and preferences of residents;
- V. **Implementation science:** There is a need for studies to assess barriers and facilitators to IDDSI implementation in diverse cultural paths and resource settings, such as low- and middle-income countries.

Closing Statement

In short, texture modification and fluid thickening are not endpoints as standalone interventions but as part of a larger paradigm of **person-centre, evidence based approaches to dementia care.**

When informed by evidence, ethics and person-centred values, these strategies can convert feeding from a medical intervention into one of dignity and rapport.

References

1. Alagiakrishnan, K., Bhanji, R., & Kurian, M. (2013). Evaluation and management of oropharyngeal dysphagia in dementia. *Archives of Gerontology and Geriatrics*, 56(1), 1–9. <https://doi.org/10.1016/j.archger.2012.08.010>
2. American Speech-Language-Hearing Association. (2020). *Adult dysphagia: Practice portal*. <https://www.asha.org/practice-portal>
3. Baijens, L. W. J., Clavé, P., Cras, P., et al. (2016). Oropharyngeal dysphagia as a geriatric syndrome. *Clinical Interventions in*

- Aging, 11, 1403–1428.
<https://doi.org/10.2147/CIA.S112507>
4. British Dietetic Association. (2022). *National descriptors for texture modification in adults*. BDA Publishing.
5. Chaudhury, H., Hung, L., & Badger, M. (2009). The role of physical environment in supporting person-centred dining in long-term care: A review. *American Journal of Alzheimer's Disease and Other Dementias*, 24(4), 384–391.
<https://doi.org/10.1177/1533317509332649>
6. Cichero, J. A. Y., Steele, C. M., Duivesteyn, J., et al. (2013). The need for international terminology and definitions for texture-modified foods and thickened liquids used in dysphagia management. *Current Physical Medicine and Rehabilitation Reports*, 1(4), 280–291. <https://doi.org/10.1007/s40141-013-0024-3>
7. Dantas, R. O., Dodds, W. J., Massey, B. T., et al. (1990). Effect of swallowed bolus variables on swallowing. *American Journal of Physiology*, 258(4 Pt 1), G675–G681.
<https://doi.org/10.1152/ajpgi.1990.258.4.G675>
8. Flynn, E., Smith, C. H., Walsh, C. D., & Walshe, M. (2018). Modifying the consistency of food and fluids for swallowing difficulties in dementia. *Cochrane Database of Systematic Reviews*, 9, Article CD011077.
<https://doi.org/10.1002/14651858.CD011077.pub2>
9. Garcia, J. M., Chambers, E., & Matta, Z. (2005). Viscosity measurements of nectar- and honey-thick liquids used in dysphagia management. *Dysphagia*, 20(4), 325–335.
<https://doi.org/10.1007/s00455-005-0039-2>
10. Groher, M. E., & Crary, M. A. (2010). Outcomes of training caregivers in thickened-liquid preparation. *Journal of Nutrition in Gerontology and Geriatrics*, 29(3), 250–263.
<https://doi.org/10.1080/01639366.2010.496178>
11. Hanson, B., O'Leary, M. T., & Smith, C. H. (2012). Effect of saliva on the viscosity of thickened drinks. *Dysphagia*, 27(1), 10–19.
<https://doi.org/10.1007/s00455-011-9332-7>
12. Holteng, L. B. A., Frøiland, C. T., Corbett, A., & Testad, I. (2017). Care-staff perspectives on texture-modified food in care-home residents with dysphagia and dementia. *Annals of Palliative Medicine*, 6(4), 310–318.
<https://doi.org/10.21037/apm.2017.06.24>
13. Hung, L., & Chaudhury, H. (2009). Exploring personhood in dining experiences of residents with dementia in long-term care facilities. *Journal of Aging Studies*, 23(1), 1–12.
<https://doi.org/10.1016/j.jaging.2007.11.002>
14. International Dysphagia Diet Standardisation Initiative. (2016). *IDDSI framework and testing methods*.
<https://iddsi.org>
15. Keller, H. H. (2016). Improving food intake in persons living with dementia. *Annals of the New York Academy of Sciences*, 1367(1), 3–11. <https://doi.org/10.1111/nyas.13058>
16. Keller, H. H., Carrier, N., Duizer, L., Lengyel, C., Slaughter, S. E., & Lengyel, C. (2012). Making the most of mealtimes (M3): Optimizing nutrition for older adults in long-term care. *Journal of Nutrition, Health & Aging*, 16(3), 195–200.
<https://doi.org/10.1007/s12603-011-0110-9>
17. Kitwood, T. (1997). *Dementia reconsidered: The person comes first*. Open University Press.
18. Langmore, S. E., Terpenning, M. S., Schork, A., et al. (2002). Predictors of aspiration pneumonia in nursing-home residents. *Dysphagia*, 17(4), 298–307.
<https://doi.org/10.1007/s00455-002-0072-5>
19. Logemann, J. A., Gensler, G., Robbins, J., et al. (2008). A randomized study of three interventions for aspiration of thin liquids in patients with dementia or Parkinson's disease. *Journal of Speech, Language, and Hearing Research*, 51(1), 173–183.
[https://doi.org/10.1044/1092-4388\(2008\)013](https://doi.org/10.1044/1092-4388(2008)013)
20. Michou, E., Mistry, S., & Hamdy, S. (2012). The role of carbonation and temperature on swallowing performance in dysphagia.

- Chemical Senses*, 37(9), 799–807.
<https://doi.org/10.1093/chemse/bjs061>
21. National Institute for Health and Care Excellence. (2018). *Dementia: Assessment, management and support for people living with dementia and their carers* (NG97).
22. Payne, C., Methven, L., Fairfield, C., & Bell, A. (2011). Commercially available starch-based dysphagia products: A pilot comparison. *Dysphagia*, 26(1), 27–33.
<https://doi.org/10.1007/s00455-010-9272-7>
23. Prince, M., Comas-Herrera, A., Knapp, M., Guerchet, M., & Karagiannidou, M. (2021). *World Alzheimer Report 2021: Journey through the diagnosis of dementia*. Alzheimer's Disease International.
24. Robbins, J. A., Gensler, G., Hind, J., et al. (2008). Comparison of two interventions for liquid aspiration on pneumonia incidence: A randomized controlled trial. *Annals of Internal Medicine*, 148(7), 509–518.
<https://doi.org/10.7326/0003-4819-148-7-200804010-00007>
25. Royal College of Physicians. (2010). *Oral feeding difficulties and dilemmas: A guide to practical care*. RCP Press.
26. Royal College of Speech and Language Therapists. (2019). *Clinical guidance on texture modification and thickened fluids in dysphagia management*.
27. Steele, C. M. (2021). The science of swallowing and person-centred dysphagia management. *Perspectives of the ASHA Special Interest Groups*, 6(4), 876–888.
https://doi.org/10.1044/2021_PERSP-21-00147
28. Steele, C. M., Cichero, J. A. Y., Duivestijn, J., et al. (2015). The influence of food texture and liquid consistency modification on swallowing physiology and function: A systematic review. *Dysphagia*, 30(1), 2–26.
<https://doi.org/10.1007/s00455-014-9578-x>
29. Sura, L., Madhavan, A., Carnaby, G., & Crary, M. A. (2012). Dysphagia in the elderly: Management and nutritional considerations. *Clinical Interventions in Aging*, 7, 287–298.
<https://doi.org/10.2147/CIA.S23404>
30. Swan, K., Speyer, R., Heijnen, B., Wagg, B., & Cordier, R. (2015). Living with oropharyngeal dysphagia: Effects of bolus modification on quality of life. *Quality of Life Research*, 24(10), 2447–2456.
<https://doi.org/10.1007/s11136-015-0991-5>
31. Takizawa, C., Gemma, A., Morita, Y., et al. (2016). Prevalence of dysphagia and associated risk factors in dementia patients: A systematic assessment. *Dysphagia*, 31(4), 434–441.
<https://doi.org/10.1007/s00455-016-9695-9>
32. Tolstrup-Anderson, U., Beck, A. M., & Martinsen, T. C. (2013). Texture-modified foods and thickened fluids for adults with oropharyngeal dysphagia: A systematic review. *e-SPEN Journal*, 8(4), 127–134.
<https://doi.org/10.1016/j.clnme.2013.04.004>
33. Ullrich, S., & Crichton, J. (2015). Older people with dysphagia: Transitioning to texture-modified food. *British Journal of Nursing*, 24(14), 686–692.
<https://doi.org/10.12968/bjon.2015.24.14.686>
34. Vilardell, N., Rofes, L., Arreola, V., & Clavé, P. (2016). A comparative study on the effects of viscosity and volume on swallowing safety in the elderly. *Dysphagia*, 31(2), 169–179.
<https://doi.org/10.1007/s00455-015-9672-8>
35. Walshe, M. (2014). Dysphagia and dementia: A review of the literature. *Age and Ageing*, 43(6), 754–759.
<https://doi.org/10.1093/ageing/afu095>
36. Weijenberg, R. A., Spreen, A., & van Hooren, S. (2013). Training care staff to improve mealtime management in dementia. *BMC Neurology*, 13, 26.
<https://doi.org/10.1186/1471-2377-13-26>
37. World Health Organization. (2021). *Global status report on the public-health response to dementia*. WHO Press.
38. Zanini, M., Bagnasco, A., Catania, G., et al. (2017). A dedicated nutritional-care program (NUTRICARE) to reduce malnutrition in institutionalized dysphagic older people: A quasi-experimental study. *Journal of Clinical Nursing*, 26(23-24),

4446–4455.

<https://doi.org/10.1111/jocn.13748>

39. Zanini, M., & Bagnasco, A. (2020). Texture modification and patient safety: Evidence synthesis. *Journal of Nursing Scholarship*, 52(4), 395–404.
<https://doi.org/10.1111/jnu.12572>
40. Prince, M., Guerchet, M., & Knapp, M. (2013). *World Alzheimer Report 2013: Journey of caring – An analysis of long-term care for dementia*. Alzheimer's Disease International.
41. Groher, M. E., & Crary, M. A. (2016). *Dysphagia: Clinical management in adults and children* (2nd ed.). Elsevier.
42. Steele, C. M., & Grace-Martin, K. (2020). Reflections on dysphagia research methodologies. *Perspectives of the ASHA Special Interest Groups*, 5(4), 877–889.
43. Alzheimers Disease International. (2020). *Nutrition and dementia: A global perspective*. ADI Press.
44. Hung, L., Phinney, A., & Chaudhury, H. (2018). Environmental design for mealtime engagement in dementia care. *Gerontology & Geriatrics Education*, 39(2), 182–200.
45. Cichero, J. A. Y. (2019). Thickening agents used for dysphagia management: Effectiveness, safety, and patient preferences. *Nutrition Journal*, 18(1), 29.
46. Steele, C. M., Cichero, J. A. Y. (2018). Physiological science behind thickened liquids. *Dysphagia*, 33(6), 819–829.
47. Keller, H. H., et al. (2020). Mealtime interventions for older adults with dementia. *Canadian Journal on Aging*, 39(4), 534–546.
48. Takizawa, C., et al. (2020). Dysphagia care and clinical outcomes during COVID-19. *Geriatrics*, 5(4), 96.
49. Zanini, M., et al. (2018). Implementation of IDDSI in European nursing homes. *Clinical Nutrition ESPEN*, 28, 112–119.
50. World Health Organization. (2019). *Integrated care for older people: Guidelines on community-level interventions*. WHO Press.