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NURSING CARE FOR ADULT/ELDERLY PATIENTS WITH IMPAIRED SWALLOWING: INTEGRATIVE LITERATURE REVIEW

CUIDADOS DE ENFERMAGEM AO DOENTE ADULTO/IDOSO COM DEGLUTIÇÃO COMPROMETIDA: REVISÃO INTEGRATIVA DE LITERATURA

CUIDADOS DE ENFERMERÍA AL ENFERMO ADULTO/PERSONA MAYOR CON DEGLUCIÓN COMPROMETIDA: REVISIÓN INTEGRATIVA DE LITERATURA

José António Dias Feiteirona[1], Eugénia Nunes Grilo[2,3,4].

[1]Master's student in Nursing at the Association of the Polytechnic Institute of Portalegre,
[2]Nursing Research Unit for South and Islands,
[3]AGE.COMM Research Unit,
[4]Superior School of Health Dr. Lopes Dias, Polytechnic Institute of Castelo Branco.

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ABSTRACT

Introduction: Compromised swallowing is a common condition, with high prevalence, with great impact on the individual at the biopsychosocial level. It is related to the increase in hospital stay, mortality rates and health costs. The improvement of therapeutic strategies is one of the pillars to address this issue.

Aims: Identify the nursing care provided to patients with impaired swallowing in different care contexts and to improve knowledge about them.

Methodology: Integrative literature review, with research of scientific articles from the search engine B-on with the search terms, swallowing disorders, elderly, nursing care, from October to December 2019. The 9 scientific articles were selected and analyzed from the PI (C) OD methodology.

Results: The analysis of the articles allowed to identify a set of nursing interventions that could prevent complications, emphasizing the early identification of the problem and rehabilitation strategies by a specialist.

Conclusion: A specialized nursing intervention in patients with impaired swallowing can have a significant clinical effect in improving this commitment and preventing complications. This theme is still little explored and it is necessary to develop new researches with the guiding principle of a more systematic practice.

Keywords: Elderly; Nursing Care; Swallowing Disorders.

RESUMO

Introdução: A deglutição comprometida é uma condição comum, de elevada prevalência, com grande impacto no indivíduo a nível biopsicossocial. Está relacionada com o aumento do tempo de internamento, das taxas de mortalidade e dos custos em saúde. O aperfeiçoamento das estratégias terapêuticas é um dos pilares para abordar esta problemática.

Objetivos: Identificar os cuidados de enfermagem prestados a doentes com deglutição comprometida em diferentes contextos de cuidados e melhorar o conhecimento sobre eles.

Metodologia: Revisão integrativa da literatura, com pesquisa de artigos científicos a partir do motor de busca B-on, com os termos de pesquisa, *swallowing disorders*, *elderly*, *nursing care*, no período de outubro a dezembro de 2019. Os 9 artigos científicos foram selecionados e analisados a partir da metodologia PI(C)OD.

Resultados: A análise dos artigos permitiu identificar um conjunto de intervenções de enfermagem suscetíveis de prevenirem complicações, salientando-se a identificação precoce do problema e estratégias de reabilitação por parte de um especialista.

Conclusões: Uma intervenção de enfermagem especializada em doentes com deglutição comprometida pode ter um efeito clínico significativo na melhoria desse compromisso e na prevenção de complicações. Esta temática ainda é pouco explorada sendo necessário o desenvolvimento de novas pesquisas com eixo norteador de uma prática mais sistematizada.
Palavras-chave: Cuidados de Enfermagem; Deglutição Comprometida; Idoso.

RESUMEN

Introducción: La deglución comprometida es una condición común, de elevada prevalencia, con gran impacto en el individuo de nivel biopsicosocial. Está relacionada con el aumento del tiempo de internamiento, tasa de mortalidad y costes en la salud. La mejora en las estrategias terapéuticas es uno de los pilares para abordar esta problemática.
Objetivos: Identificar los cuidados de enfermería prestados a enfermos con deglución comprometida en diferentes contextos de cuidados y mejorar el conocimiento sobre ellos.
Metodología: Revisión integrativa de la literatura, a través de la investigación de artículos científicos con recurso al buscador B-on con los términos de búsqueda *Swallowing disorders*, *elderly*, *nursing care*, entre octubre y diciembre de 2019. Los nueve artículos fueron seleccionados y analizados desde la metodología PI(C)OD.
Resultados: El análisis de los artículos permitió identificar un conjunto de intervenciones de enfermería susceptible de prevenir complicaciones, destacándose la identificación precoz del problema y estrategias de rehabilitación por un especialista.
Conclusiones: Una intervención de enfermería especializada en enfermos con deglución comprometida puede tener un efecto clínico significativo en la mejora de ese compromiso y en la prevención de complicaciones. Esta temática todavía está poco explorada, haciendo falta el desarrollo de nuevas búsquedas con el principio rector de una práctica más sistematizada.
Descriptores: Cuidados de Enfermería; Deglución Comprometida; Persona Mayor.

INTRODUCTION

In the elderly, the swallowing mechanism becomes less efficient due to degeneration of the neuromuscular system and associated morphophysiological changes[1]. Compromised swallowing (CS), commonly referred to as dysphagia, is a growing health concern in view of the aging population. Epidemiological studies in the United States suggest that dysphagia affects 22% of adults over 50 years of age and that 75% of people living in nursing homes have experienced some degree of dysphagia[2]. In Japan, the prevalence of dysphagia in elderly people living in the community is 13.8% and 63.8% in nursing home residents[3].

In addition to advanced age, other risk factors for the development of this impairment are gender (higher incidence in males), long-term living in institutions, decline in cognitive function, neuromuscular disorders, stroke, prevalence of associated diseases, and polymedication[4]. Structural changes as a result of tumors and trauma are also responsible for CS[5]. A study conducted in the UK in 2011 describes a prevalence rate of this impairment of 11% in the general community with a prevalence of 40 to 80% in patients with stroke and neurodegenerative diseases[6].

Swallowing associated with the life activity of eating should be understood beyond biological issues. It is a form of expression of values and beliefs that are revealed by the person's socialization. Therefore, any disorder of this function will interfere with all aspects of social and leisure life, with great impact on the quality of life of the person[7].

In the International Classification for Nursing Practice (ICNP, 2015), swallowing is defined as the physiological process of "the passage of liquids and fragmented food, by the movement of the tongue and muscles, from the mouth to the stomach through the oropharynx and esophagus"[8:52]. Although it is considered a continuous process, swallowing is divided into phases, which vary in number according to different authors. One may consider three phases, the oral, pharyngeal and esophageal phases, or four, with the inclusion of the preparatory phase[9]. A fifth phase, the anticipatory phase, can also be included, because before food enters the oral cavity, the type, speed, and volume of food and the environment of the meal must be decided[10]. The anticipatory and preparatory phases, because they are voluntary and initiate the deglutition, can be considered as being part of the oral phase, which is followed by the pharyngeal and esophageal phases, reflex or involuntary, which allow the passage of the food through the pharynx to the esophagus and from the esophagus to the stomach[11].

Oropharyngeal dysphagia encompasses swallowing disorders of oral, pharyngeal, laryngeal, and upper esophageal sphincter origin and accounts for 80% of diagnosed dysphagias. Esophageal dysphagia refers to changes in the lower esophageal sphincter and cardia and is often associated with mechanical causes, accounting for 20% of diagnosed dysphagia[12].

CS includes oropharyngeal dysphagia and excludes esophageal dysphagia[13,14] and can manifest by various signs such as difficulty initiating swallowing, repeated swallowing, nasal regurgitation, dyspnea, noisy breathing, tearing, throat clearing after swallowing, odynophagia, feeling of congestion in the oropharynx, chest pain during feeding, and altered voice quality. Other manifestations can be present such as exaggerated tongue movements, increased secretions, anorexia, weight loss for no apparent reason, loss of saliva through the oral cavity, or the presence of food residues in the mouth after swallowing, and also halitosis and recurrent pneumonias[6,15,16]. The level of wakefulness, breathing characteristics, airway clearance, ability to chew, cervical control and degree of dependence may predict the risk or actual presence of CS, as may coughing associated with feeding[17]. However, in some cases the cough response may be absent, being therefore important to be aware of more subtle signs of aspiration[16] or episodes of desaturation during feeding that should be valued as warning signs[18].

Malnutrition may be a consequence of CS and contributes to the deterioration of functional capacity and muscle weakness, given that these conditions may in turn favor and exacerbate the aforementioned impairment causing a vicious circle[19]. It is also responsible for aspiration pneumonia[20], increased length of stay and mortality rates, and poorer long-term health prognosis[21].

The pillars to overcome this problem are early diagnosis and intervention, the training of healthcare professionals, and the improvement of therapeutic strategies[22]. Thus, in order to improve the knowledge about the nursing care provided to patients with CS, the main question of this literature review was set as "Which nursing care has proven to be effective in rehabilitation and prevention of complications in adult/elderly patients with CS?" and the following objectives were established: to identify the nursing care provided to patients with CS in different care settings and systematize this care based on the literature review.

METHODOLOGY

Methodology refers to the set of means and activities used to answer the research questions[23]. The integrative literature review method enables the ability to systematize scientific knowledge and allows the researcher to approach the issue to be analyzed, in order to understand the evolution of the topic over time[24]. Considering the objectives of this review – to identify nursing care provided to adult/elderly patients with CS in different care settings and to describe this care – the PI(C)OD strategy (Chart 1↗) was defined to answer the question formulated with the search descriptors "swallowing disorders", "elderly", "nursing care", validated in the Mesch and Decs platforms.

For the review, the databases Complementary Index, Academic Search Complete, Science Direct, Science Citation Index and Social Sciences Citation Index were consulted from the B-on search engine from October to December 2019, with the descriptors "swallowing disorders" AND "elderly" AND "nursing care".

In a first search we obtained 6840 articles. From these articles, 583 were subsequently selected that met the time interval between January 2018 and December 2019, peer-reviewed and available in full text. By reading the title and abstract we arrived at 51 articles. After reading and analyzing them, 40 articles were excluded for referring to populations under 18 years old, end-of-life patients, esophageal dysphagia and for not being written in English. Thus, 11 relevant articles were considered. Two articles (Jones *et al*, 2018 and Carmo *et al*, 2018) were excluded due to a low level of evidence and 9 articles were considered to be the ones included in this review (Figure 1↗).

This review followed the methodology indicated by the Joanna Briggs Institute Reviewers manual[25] and all selected articles have a recommendation grade of A according to Chart 2↗.

From the reading and analysis of the 9 articles resulted an overview table with the description of the studies, which includes the title, year and author(s) of the study, objectives, participants, interventions, comparisons, results, and study design (Chart 3↗).

RESULTS

All of the selected articles included adults/elderly participants with CS as defined in the research protocol, but not all of them described exclusively nursing interventions. In the international context, the specialty of rehabilitation nursing does not exist; therefore, we chose to include studies that described the activities of other health care professionals, given that some interventions overlap with several professional areas. Thus, most (6 of 9) of the included studies are randomized controlled trials. We also included 2 systematic literature reviews with meta-analysis and 1 quasi-experimental study.

From the results obtained, it is highlighted that swallowing evaluation before oral feeding, diet modification, oral hygiene programs, as well as psychological intervention and health education are cares that can decrease the risk of aspiration. Swallowing muscle exercises can decrease the severity of CS and can be enhanced with transcutaneous, tactile, and thermal neuromuscular electrical stimulation. Chart 3↗ shows the 9 articles that were selected and analyzed according to the research protocol and analysis.

DISCUSSION

According to the reviewed articles the terms CS, swallowing disorders and oropharyngeal dysphagia are terms used interchangeably to refer to the inefficient or unsafe flow of liquid or solid from the mouth to the esophagus, which may be at the origin of serious complications such as malnutrition, dehydration and pneumonia, accelerating processes of frailty and morbidity[19,20]. CS is a highly prevalent disorder in people with systemic neurological and neurodegenerative diseases[5,6], with head and neck tumors, and in the elderly. It underlies social[7] and psychological stigmas, depressive states, and is related to a significant decrease in quality of life. Its assessment, management and treatment require knowledge, skills and training from several disciplines[14].

The nursing interventions identified in the studies were screening and clinical assessment of CS for early diagnosis[26,27], especially in CS secondary to stroke and in hospital settings. The study by Molina *et al* (cod.1), concluded that these patients should be approached by a multidisciplinary team and that a nurse specialist is important to manage specific care, which is fundamental for an improvement in quality of life and prognosis[26]. CS is a problem that requires multidisciplinary intervention and should be identified as early as possible through clinical history and a swallowing test by any member of the clinical team[27].

Regarding the assessment tools to identify swallowing impairment, the review of articles made it clear that there are several tools that have been used by different authors, and there is currently no consensus on the best or most reliable tool to diagnose CS[22]. The great benefit of using instruments to assess swallowing dynamics is that it allows the diet to be safely tailored to each person according to their compromise[28]. Regardless of the assessment tool that professionals may use for screening, complementary noninvasive techniques and methods such as cervical auscultation, pulse oximetry, and laryngeal excursion can also be used[29], since 50% of patients who aspirate have no cough or other external signs indicating food or liquid entering the airways[30].

The assessment of swallowing on admission and before the start of oral feeding is therefore of great importance in reducing the incidence of pneumonia. In the study by Eltringham *et al* (cod.9), the authors concluded that delays in assessment by the speech therapist were associated with an absolute risk of pneumonia incidence of 1% per day of delay[31]. Other authors had already highlighted the importance of early assessment especially in patients belonging to the risk groups, particularly in those with high risk associated with comorbidities, advocating that a specific protocol for screening and management of CS, as well as a team with specific knowledge are fundamental, acknowledging that these two variables are related to lower rates of pneumonia[6]. The nursing team plays a crucial role in this area of care because it is present 24 hours a day with patients and by participating and supervising their feeding and hydration it can quickly identify the signs and symptoms related to CS[32].

The study by Zhang & Ju (cod. 4), which aimed to assess the effects of a specialized nursing intervention in swallowing re-education in elderly patients with stroke and CS, concluded that this intervention has a significant clinical effect in improving compromised swallowing. With a specialized intervention it was possible to verify an increase in knowledge about the disease, improved control of emotions, greater adherence to therapy, faster recovery of the structures involved in swallowing, and maintenance of nutritional balance. The researchers also concluded that this intervention was the basis for the reduction of pulmonary infection and increased quality of life[33].

As far as functional swallowing re-education, it essentially encompasses compensatory techniques that allow patients to swallow some food orally without aspiration and the rehabilitation exercises aim to improve strength and coordination[34]. The planning of therapeutic strategies should be individualized and involve the caregivers and may also guide to the observation of the patient by other technicians, performance of complementary exams and procedures necessary for the diagnosis and treatment of CS[14,22]. In this sense, CS is an important area of intervention for specialist nurses in rehabilitation nursing. According to

Regulation No. 392/2019, produced by the Portuguese Order of Nurses, they design, implement, and monitor rehabilitation nursing care plans based on people's problems and needs. Through their intervention, they can ensure the maintenance of patients' functional capabilities, prevent complications, minimize the impact of disabilities, and maximize the person's potential to return home with greater independence and quality of life[35]. Rehabilitation nursing care is directed to the person at any stage of his/her life cycle and in all care settings[36].

Some care includes posture, where patients should be seated well during feeding. Readiness, in which the diet should be offered when patients are fully alert, the amount of food to swallow, in which smaller portions are more easily managed, the speed of eating and drinking, in which time should be allowed for swallowing, maximization of nutrition, in which the amount of the meal should be smaller but more calorie-dense, and maximization of hydration, respecting the textures and consistencies recommended by the International Dysphagia Diet Standardization Initiative[19], are also important nursing care.

Compensatory measures may include strategies to change the consistency of the diet, but also postural changes[14]. Cervical flexion because it protects the airway, decreasing the risk of aspiration and is useful in a slowed swallowing reflex and reduced laryngeal closure. In the case of unilateral impairment of the pharyngeal wall and unilateral vocal fold weakness, lateralization should be performed on the healthy side because it allows the food to be directed to the healthy side of the pharynx, while rotation should be on the injured side in order to obstruct the weaker region. People with impaired tongue control benefit from cervical extension because it increases the speed of oral transit time, due to force and gravity; however, this maneuver should only be used in cooperative people with a good level of comprehension and no alterations in airway protection[29].

Other compensation techniques for sensory stimulation such as increasing the amount of bolus offered and changing viscosity can be used to improve the response to the presence of the bolus in the oropharyngeal region, to address deficits in oral control and manipulation, and to improve the onset of swallowing. Increasing viscosity reduces the incidence of penetration and aspiration into the airway, however, thicker viscosities increase the prevalence of pharyngeal residue after swallowing. Tactile and thermal stimulation prior to swallowing with cold touch on the faucial pillars appears to be effective in brain activation with improvement of the swallowing reflex. Taste modification (sour, sweet, salty) as well as the use of carbonated beverages used to increase sensory awareness still seems to be contradictory[14]. However, the study by Wang *et al* (cod. 5) conducted in order to verify the effects of using natural capsaicin on CS in stroke patients, concluded that tactile/thermal stimulation with natural capsaicin in the oropharynx and oral administration of capsaicin improve swallowing function[37].

Compensatory measures improve swallowing safety by allowing patients to eat and drink orally, but they do not contribute to the rehabilitation of the dysfunction, so the combination with rehabilitation techniques is important[1]. Rehabilitation exercises are based on the myofunctional component and swallowing maneuvers. There are a series of exercises for specific muscles or muscle groups in the oral cavity and pharynx that have improved the amplitude, strength, accuracy and speed of the function of some anatomical structures involved in oropharyngeal swallowing, namely the lips, tongue, larynx and jaw, which can be effective in improving CS. However, it is necessary to realize that it may take 2 weeks to 2 months to achieve results[30]. To prevent patient fatigue and improve swallowing control, the exercises can be performed several times a day, with 10 sessions of 5 minutes each being indicated[34].

Anterior hyolaryngeal elevation during a swallow as a result of contractions of the suprahyoid muscle plays a key role in opening the upper esophageal sphincter, with relaxation of the cricopharyngeal muscle and laryngeal closure. Mendelsohn maneuver, forced swallowing, and Shaker exercise are shown to be beneficial in this procedure[3]. An Agrawa *et al* study (cod.6), which aimed to verify the biomechanical effect of a resistance exercise program (swallowing against laryngeal restriction) on the pharyngeal phase of swallowing in elderly people without CS, concluded that strength training of the muscles of the pharyngeal phase of swallowing improves its main physiological aspects, including a significant increase in the contractile function of the suprahyoid, presenting itself as a measure with potential for the treatment and prevention of CS in the elderly[38]. The authors recommend further studies focusing on the exercise regimen intensity, frequency, and duration needed to maintain strength and mechanical benefits[38]. Another investigation, that of Wakabayashi, *et al* (cod.7) that aimed to verify the effects of resistance training of swallowing muscles in elderly people with CS concluded that resistance training did not affect CS or strength of swallowing muscles due possibly to low exercise compliance rates. This study pointed out that adequate nutrition was related to better outcomes in CS rehabilitation[39], with dietary supplementation of protein, amino acids, and vitamin D proving helpful in improving muscle functions[40].

Swallowing re-education techniques require voluntary control, so patient collaboration is important. The study by Kawanoa *et al* (cod.2) evaluating a CS rehabilitation method involving candy sucking training ("lollipops") in elderly people with dementia concludes that this rehabilitation method was well accepted, as they were able to comply with all instructions despite their dementia, and there was also an improvement in their oral function[41].

The evidence base for rehabilitation therapies continues to expand. Therapies that involve retraining neuromuscular systems to stimulate neuroplasticity are used successfully[27]. Neuromuscular electrical stimulation is an effective method in the rehabilitation of individuals with neurogenic oropharyngeal dysphagia, enabling the return of oral diet and a decrease in episodes of laryngotracheal aspiration, and associated with traditional therapy (tactile-thermal-gustatory stimulation) shows greater efficacy[42]. In the study by Sproson *et al* (cod.8), in which the authors combined trans cutaneous neuromuscular electrical stimulation with swallowing strengthening exercises in the treatment of post-stroke CS, they found successful recruitment, safety and tolerability with clinically significant improvements[43].

Tooth loss and the use of inadequate dental prostheses also negatively interfere with the entire swallowing process, and the prevalence of CS is higher in elderly people with altered oral sensory-motor system[44]. A routine oral health program implemented by Chen *et al* (cod.3) during rehabilitation of patients with post-stroke CS, allowed to decrease barriers to successful swallowing therapy, promote oral health, and maintain oral intake[45]. It is important to recognize that aspiration pneumonia develops in CS patients after oral aspiration of saliva- or food-associated bacteria, hence careful oral hygiene can significantly reduce the incidence of aspiration pneumonia[46].

CONCLUSION

The studies that were analyzed addressed adult/elderly patients with CS who received nursing care, but studies with practices developed by professionals from other disciplines were also included and analyzed, namely, oral maxillofacial radiology (cod.2), gastroenterology (cod.6), speech therapy (cod.8) and physical medicine and rehabilitation (cod.7).

There is some consensus that the approach to patients with CS should be carried out by a multidisciplinary team, with the nursing team playing a crucial role in this area of care given its continuous contact with patients, which facilitates early detection.

The assessment tools for CS are very heterogeneous, and up to now there is no consensus about the best or most correct one. In nursing care, the best one for each situation should be used to assess patients. Especially in CS secondary to stroke and in hospital settings, the assessment of swallowing before the start of oral diet is essential and should be systematized for patients belonging to risk groups.

Once CS is detected, it is essential to adopt compensatory measures in order to prevent complications and to identify situations that should be referred to other professionals.

As regards the compensatory measures developed by specialist nurses in rehabilitation nursing, they improve swallowing safety, and should combine rehabilitation techniques in order to allow the recovery of the dysfunction. They are based on the myofunctional component and on swallowing maneuvers. The planning of therapeutic strategies should be individualized and involve caregivers, and it is important to integrate new evidence for rehabilitation therapies that continue to expand, particularly in the area of neuroplasticity stimulation.

The specialized nursing intervention in patients with CS may have a significant clinical effect in improving swallowing compromise and preventing complications, although few articles address this topic, and the development of new research is necessary as a guiding axis for a more systematized practice.

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Authors
José António Dias Feiteirona
https://orcid.org/0009-0000-7088-3986
Eugénia Nunes Grilo
https://orcid.org/0000-0003-1206-8443

Corresponding Author/Autor Correspondente:
José Feiteirona – Instituto Politécnico de Portalegre, Portalegre, Portugal.
jose.feiteirona@gmail.com

Authors' contributions/Contributos dos autores
JF: Coordenação do estudo, desenho do estudo, recolha, armazenamento e análise de dados, revisão e discussão dos resultados.
EG: Desenho do estudo, análise de dados, revisão e discussão dos resultados.
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Chart 1 – Study Design.↖

				Keywords
P	Participants	Who was studied	Adult and elderly with CS	Swallowing disorders Elderly Nursing care
I	Intervention	What was done	Nursing care provided to the adult/elderly patient with CS	
C	Comparison	They may or may not exist		
O	Outcomes	Outcomes/effects, or consequences	Outcomes of the nursing care provided to the adult/elderly patients with CS	
D	Design (study design)	How the evidence was collected	Quantitative studies, qualitative studies, and systematic literature reviews	

Chart 2 – Level of evidence and grade of recommendation of the studies (JBI, 2017).

Study Code (cod.)	Author(s)	Year	Study Design	Level of Evidence	Degree of Recommendation
1	Molina, L. *et al.*	2018	Systematic literature review with meta-analysis	Level 1.a	Grade A
2	Kawanoa, H. *et al.*	2018	Randomized controlled study	Level 1.c	Grade A
3	Chen, H. *et al.*	2018	Randomized controlled study	Level 1.c	Grade A
4	Zhang, R. e Ju, X.	2018	Randomized controlled study	Level 1.c	Grade A
5	Wang, Z. *et al.*	2019	Randomized controlled study	Level 1.c	Grade A
6	Agrawa, D. *et al.*	2018	Quasi-experimental study	Level 2.c	Grade A
7	Wakabayashi, H. *et al.*	2018	Randomized controlled study	Level 1.c	Grade A
8	Sproson, L. *et al.*	2018	Randomized controlled study	Level 1.c	Grade A
9	Eltringham, S. *et al.*	2018	Systematic literature review with meta-analysis	Level 1.a	Grade A

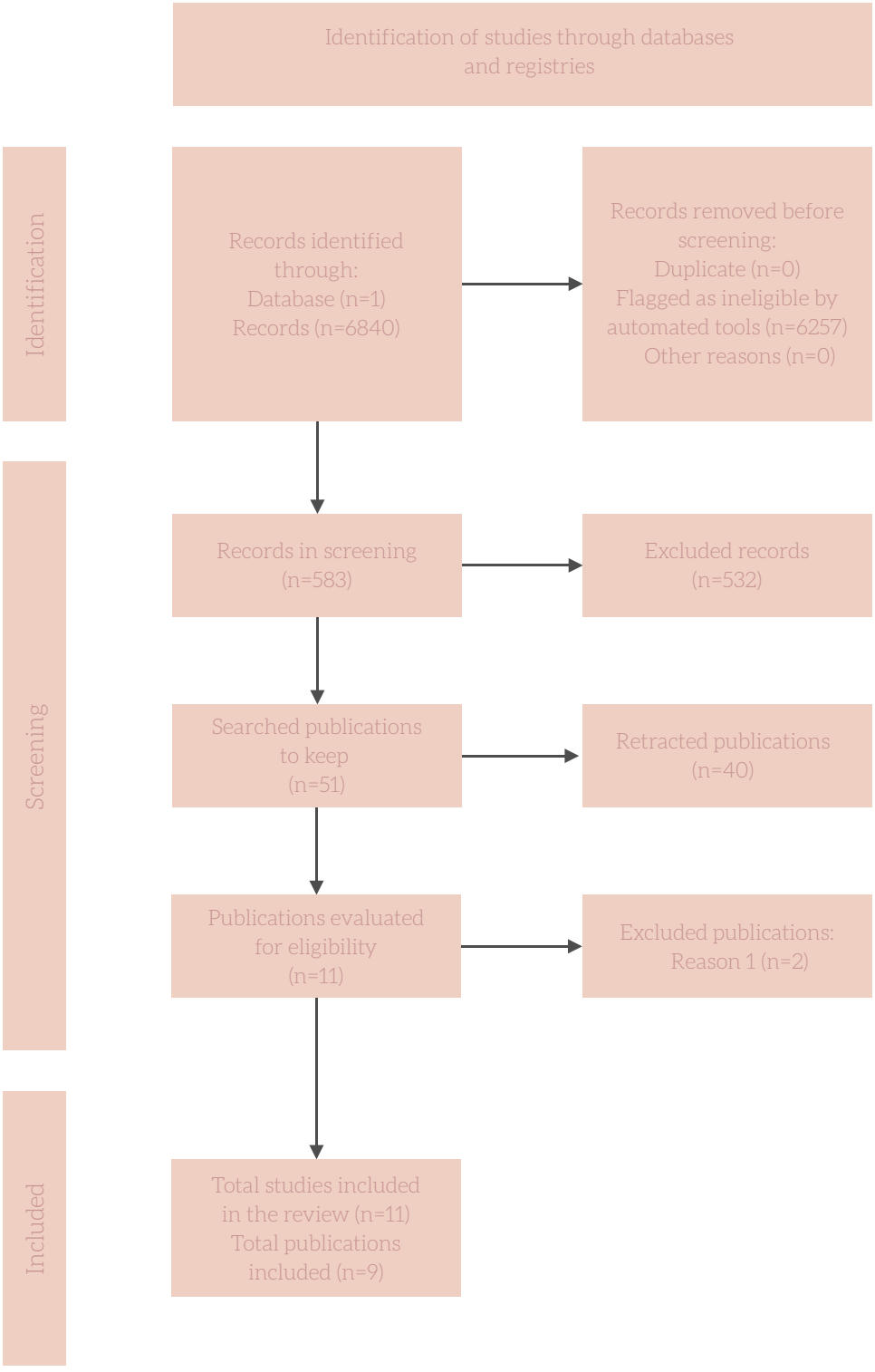


Figure 1 – Inclusion and exclusion criteria for research articles.[↖]

Chart 3 – Description of the studies.[→↖↖]

Title/Year/Author(s)	Objectives/ Participants	Interventions	Comparison	Outcomes	Study Design
(1) Nursing interventions in adult patients with oropharyngeal dysphagia: a systematic review. Molina *et al* (2018).	To know the interventions performed by nursing professionals in the care of patients with CS. Adults with secondary CS to aging, neurodegenerative disease or stroke.	Patient assessment and screening for CS, clinical evaluation of CS, care for the patient already diagnosed with CS, therapeutic education and prevention interventions regarding CS.		The prevalent interventions performed by nursing professionals are screening and clinical assessment of CS for early diagnosis, especially in CS secondary to stroke and in hospital settings.	Systematic literature review with meta-analysis.
(2) Candy eating behaviour to improve swallowing function in dementia subjects. Kawanoa *et al* (2018).	To evaluate a rehabilitation method for CS involving candy sucking ("lollipop") training in older people with dementia. 25 older people with dementia living in a nursing home.	Sucking training ("lollipop") 1 time a day, 3 times a week, for 6 months. Cognitive, physical, nutritional status and oral function evaluation.	Comparison between Group with increased (n= 4) sucking > 0.1 g/mint. in the Candy Sucking Test (CST). No increase group (n= 21) in CST.	The CST values of the augmentation group before training were significantly lower compared to the no augmentation group. There was an increase in Body Mass Index in the augmentation group.	Randomized controlled study.
(3) Effect of an Oral Health Programme on oral health, oral intake, and nutrition in patients with stroke and dysphagia in Taiwan: a randomised controlled trial. Chen *et al* (2018).	To evaluate the effect of an oral health program prior to swallowing training in patients with CS after stroke. 66 adults/elderly with CS after a first stroke with nasogastric tube admitted to 4 rehabilitation units.	Implementation of the oral health program 30 minutes before swallowing training, 3 times a week, for 3 weeks. Evaluation of oral capacity, nutritional status, and nasogastric tube removal rates.	Control group (n= 33): receives usual oral care. Intervention group (n= 33): in addition to receiving the usual oral care, they integrated the oral health program before swallowing training.	The intervention group compared to the control group had significant improvements in oral health, a higher FOIS score, and an increased rate of nasogastric tube removal.	Randomized controlled study.

Chart 3 – Description of the studies.

Title/Year/Author(s)	Objectives/ Participants	Interventions	Comparison	Outcomes	Study Design
(4) Clinical improvement of nursing intervention in swallowing dysfunction of elderly stroke patients. Zhang & Ju (2018).	To verify the effects of a specialized nursing intervention on swallowing re-education in older people with stroke and CS. 120 elderly people with stroke and CS admitted to a hospital.	Psychological intervention, health education, rehabilitation exercises, dietary intervention. Evaluation of swallowing dysfunction, quality of life, pulmonary infection rate, and satisfaction with nursing care.	Control group (n= 60): receives prescription-based nursing care. Intervention group (n= 60): receives specialized nursing care in the approach to CS.	The 2 groups had improvements, with higher percentages in the intervention group. Swallowing dysfunction (96.67% and 83.33%), satisfaction with nursing care (98.33% and 88.33%). Lower pulmonary infection rate in the intervention group (1.67% and 11.67).	Randomized controlled study.
(5) Effects os capsaicin on swallowing function in stroke patients with dysphagia: a randomized conttolled trial Wang *et al* (2019).	To verify the effects of using natural capsaicin in stroke and CS patients. 69 stroke and CS patients admitted to a hospital.	Tactile/thermal stimulation on the oropharyngeal mucosa with a cotton swab soaked in capsaicin solution at a temperature of 4°c for a maximum time of 5 minutes. Administration of 1 ml of capsaicin diluted in mineral water. Intervention performed 3 times a day before each meal for 3 weeks. Swallowing evaluation.	Control group (n= 35): received placebo stimulation. Intervention group (n= 34): received capsaicin stimulation.	Both groups had improvements in the water swallow test with a higher percentage in the intervention group (90% and 30%). The results of the EAT-10 decreased in both groups, and in the intervention group it was higher.	Randomized controlled study.
(6) Swallow strength training exercise for elderly: a health maintenance need. Agrawa *et al* (2018).	To verify the biomechanical effect of a resistance exercise program (swallowing against laryngeal restriction), on the pharyngeal phase of swallowing in elderly people without CS. 38 elderly persons without a history of CS.	Swallowing strength training exercise for 6 weeks to 28 volunteers. Swallowing assessment before and after training. 10 elderly people were assessed for swallowing before and after 6 weeks of simulated exercise.		Strength training of the muscles of the pharyngeal phase of swallowing improves its main physiological aspects, including a significant increase in contractile function of the suprahyoid.	Quasi-experimental study.

Chart 3 – Description of the studies.

Title/Year/Author(s)	Objectives/ Participants	Interventions	Comparison	Outcomes	Study Design
(7) The effects of resistance training of swallowing muscles on dysphagia in older people: a cluster, randomized, controlled trial. Wakabayashi *et al* (2018).	To verify the effects of resistance training of swallowing muscles in elderly people with CS. 91 Individuals aged ≥ 65 years old with CS integrated in day-care centers.	Resistance exercises of the swallowing muscles performed for 10 seconds each with 10 repetitions / 2 times a day / 3 times a week for 3 months. Hand out leaflet about CS rehabilitation. Assess adherence to performing the exercises, compromised swallowing, nutritional status and tongue pressure.	Control group (n= 48) and Intervention group (n= 43). Both groups received a leaflet about CS rehabilitation and the intervention group was instructed to perform resisted exercises of the swallowing muscles.	Adherence to resistance training was 67%. There were improvements in CS in both groups, but without significant differences. The MNA score correlated significantly with the EAT-10 score. No significant changes were observed in tongue pressure.	Randomized controlled study.
(8) Combined electrical stimulation and exercise for swallow rehabilitation post-stroke: a pilot randomized control trial. Sproson *et al* (2018).	To verify the effect of the combination of transcutaneous neuromuscular electrical stimulation with swallowing strengthening exercises in the treatment of CS after stroke. 30 adult patients recruited in 3 health care units with stroke diagnosed more than 1 month ago and with CS.	Combination of transcutaneous neuromuscular electrical stimulation and swallow strengthening exercises 30 minutes, 5 days a week for 4 weeks. Evaluation of swallowing, quality of life, and severity of aspiration.	Control group (n= 15) receives "usual" care; intervention group (n= 15) receives a combination of transcutaneous neuromuscular electrical stimulation and swallowing strengthening exercises.	Both groups evolved favorably, with the intervention group showing better results. In the FOIS (75% and 53%), Quality of Life Scale (83% and 38%). There was a reduction in the severity of penetration-aspiration in both groups, and in the intervention group it was greater.	Randomized controlled study.

Chart 3 – Description of the studies.

Title/Year/Author(s)	Objectives/ Participants	Interventions	Comparison	Outcomes	Study Design
(9) Impact of dysphagia assessment and management on risk of stroke-associated pneumonia: a systematic review. Eltringham *et al* (2018).	To examine how methods of screening, assessment and management of CS in stroke patients influence the risk of pneumonia. Stroke patients with a length of hospital stay of less than 72 hours.	Assessment and management of CS in the first 72 hours of hospital admission and recorded frequency of stroke-associated pneumonia.		Patients with swallowing assessment on admission before the start of oral feeding had a lower incidence of pneumonia. Delays in assessment by the speech therapist were associated with an absolute risk of pneumonia incidence of 1% per day of delay.	Systematic literature review with meta-analysis.