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Dysphagia in the Elderly with COVID-19: Implications and Comorbidities in the pandemic era

Disfagia em Idosos com COVID-19: Implicações e comorbidades na era da pandemia

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ABSTRACT

Dysphagia is frequent in the elderly population, especially in individuals with COVID-19. The aim of this integrative review was to elucidate the connection between dysphagia and COVID-19 in the elderly, focusing on the implications arising from it and associated comorbidities. Methods: A comprehensive search using the PICO strategy was conducted in six databases: PubMed/Medline, Embase, LILACS, Scopus, Web of Science, and SpeechBITE. Articles published between 2019 and 2022, without language restrictions, involving participants aged 60 years or older diagnosed with COVID-19 and exhibiting signs/symptoms of dysphagia were included. Results: The analysis included 42 articles, with the majority being case reports. The sample involved 298 older adults, with a mean age of 70.5 years and a predominance of males. The implications of dysphagia included the need for alternative feeding, laryngotracheal penetration/aspiration, adjustment in diet consistency, aspiration pneumonia and dysfunction in the orofacial and pharyngeal muscles. Pre-existing comorbidities associated with COVID-19 were identified, such as Guillain-Barré Syndrome, Myasthenia Gravis, Hypertension and Diabetes Mellitus. Conclusion: This integrative review highlights several implications of dysphagia in the elderly with COVID-19, with alternative feeding being the most mentioned. However, less than half of the studies described the implications observed among patients. The findings highlight the need for future investigations and development of appropriate therapeutic strategies aimed at improving quality of life and preventing complications in this population. Identification of the implications and comorbidities associated with dysphagia may assist in the development of more effective and safer clinical management approaches.

Keywords: SARS-CoV-2, Swallowing disorders, Swallowing, Aging, Aged, Comorbidities, Alternative Feeding.

1 INTRODUCTION

The devastating pandemic of COVID-19, which by May 2023 has victimized an extraordinary number of approximately 767.4 million individuals globally, and sadly led to the death of more than 6.9 million people, stands as a public health crisis unparalleled in contemporary history. At the heart of this adverse scenario, Brazil counts approximately 37.6 million confirmed cases[1,2]. This unprecedented epidemiological situation has instigated the scientific community to vigorously engage in the search for answers to the numerous questions that the disease presents, in order to enable an efficient and appropriate intervention to the current health panorama.

COVID-19 presents several complications, especially when associated with pre-existing diseases or iatrogenic complications, among them dysphagia[3,4]a prevalent and worrisome disorder. Dysphagia refers to any difficulty in conducting food from the mouth to the stomach, presenting negative consequences by affecting several dimensions of the individual[5].

Many patients with COVID-19 develop dysphagia during the course of the disease, which affects both sensory and motor processes and compromises the complex neural network that performs and coordinates the swallowing mechanism. This is related to the loss of taste and smell, which are common neurological symptoms in people with COVID-19[6-8].

Although all population groups are susceptible to the disease, the elderly are among the most vulnerable and the risk of severe complications may increase with age[9]. In the elderly population, dysphagia can cause a lower perception of food viscosity, weakened oral muscles that impair the propulsion of the bolus, fatigue during chewing, need for multiple swallows, slower responses in all phases of swallowing, among other difficulties[10-12].

The signs of laryngotracheal penetration/aspiration such as coughing, choking, wet voice and aspiration pneumonia, are common within the range of possible alterations in swallowing efficiency, and may lead to both increased hospitalization time and readmission rate due to worsening of the case, in addition to a higher mortality rate[12-14].

Dysphagia can develop in hospitalized patients with COVID-19 who need prolonged intensive care, intubation, mechanical ventilation, tracheostomy, prone position, and nasogastric tube, because the use of invasive devices, the need for sedatives or neuromuscular blockers, and acquired muscle weakness due to disuse of structures can affect the swallowing mechanism[14-16].

Swallowing alterations require immediate attention because they are directly related to malnutrition, dehydration, and loss of functionality and independence of the affected person, generating biological, psychological, and social compromises. Dysphagia is also a factor that contributes to the increase in the mortality rate of the elderly patient, especially when due to

COVID-19; therefore, it is evident the importance of early identification of the related signs and symptoms in this population[17].

The presence of the speech therapist in the multiprofessional team during the treatment of dysphagia is essential and contributes significantly to the recovery of the individual's quality of life, considering that the understanding of the impact of COVID-19 on the swallowing of patients favors the structuring of health services and the positioning of the rehabilitation team, providing efficient support in all contexts of patient care[18].

This integrative review aims to deepen the understanding of the implications and comorbidities associated with dysphagia in the elderly with COVID-19. We aim to enhance current knowledge on how dysphagia, especially in combination with COVID-19, affects this population, emphasizing specific care needs and the importance of effective clinical management. Through analysis of a wide range of studies published between 2019 and 2022, we seek to provide insights that can guide future research and assist in creating more effective and safer therapeutic strategies to improve quality of life and prevent complications in this population.

2 METHOD

2.1 RESEARCH STRATEGY

The present study consists of an integrative literature review, which was conducted following a rigorous set of methodological steps. The first stage involved the elaboration of the research question, which was formulated in a judicious and objective manner. In the second stage, the descriptors and keywords that guided the construction of search strategies for articles in the databases were defined.

In the third stage, the articles were selected according to the previously defined and tested eligibility criteria. Then, the articles were read, collected, and critically analyzed in order to extract relevant data for the investigation in question.

Finally, in the fifth and last step, we proceeded to the interpretation and discussion of the results obtained, with the objective of making a summary of the knowledge about the theme, for the synthesis of knowledge. It is worth mentioning that all the steps were carried out thoroughly and systematically, aiming to ensure the reliability and validity of the results obtained.

The PICO (abbreviation for *patient, intervention, comparison, outcomes*) strategy was used to formulate the guiding question. Thus, the guiding question of this study was: "What are the implications of dysphagia in elderly patients with COVID-19?".

The search for the studies occurred in October 2022 in the *PubMed/Medline*, *Embase*, *LILACS*, *Scopus*, *Web of Science*, and *SpeechBITE databases*. Search strategies were performed for each database using specific word combinations and truncations (Table 1). In all databases the search was conducted in the English language and in the Portuguese and Spanish languages specifically in *SpeechBITE* and LILACS.

Table 1. Example of the databases and search strategies.

Database	Search strategy
Medline / PubMed	("Deglutition Disorders"[MeSH Terms] OR "Deglutition Disorders"[All Fields] OR "Deglutition Disorder"[All Fields] OR "Swallowing Disorders"[All Fields] OR "Swallowing Disorder"[All Fields] OR "Dysphagia"[All Fields] OR "dysphagias"[All Fields] OR "swallowing difficult"[All Fields] OR "swallowing difficulty"[All Fields difficulty"[All Fields] OR "deglutition difficulty"[All Fields] OR "difficult deglutition"[All Fields] OR "difficulty in swallowing"[All Fields] OR "difficulty swallowing"[All Fields] OR "esophageal motility disorders"[All Fields] OR "VVST"[Title/Abstract] OR "DSQ"[Title/Abstract] OR "FOIS"[Title/Abstract]) AND ("covid 19"[MeSH Terms] OR "covid 19"[All Fields] OR "covid 19"[All Fields] OR "COVID19"[All Fields] OR "Coronavirus Disease 2019"[All Fields] OR "Pandemic"[All Fields] OR "Pandemics"[All Fields] OR "sarscov 2"[MeSH Terms] OR "sarscov 2"[All Fields] OR "sarscov 2"[All Fields] OR "2019 ncov"[All Fields] OR "2019 ncov"[All Fields] OR "2019 ncov"[All Fields] OR "2019 ncov"[All Fields] OR "2019 Novel Coronavirus"[All Fields] OR "2019 Novel Coronaviruses"[All Fields]) AND ("Aged"[MeSH Terms] OR "Aged"[All Fields] OR "Elderly"[All Fields] OR "aged, 80 and over"[MeSH Terms] OR "80 and over"[All Fields] OR "Oldest Old"[All Fields] OR "Nonagenarian"[All Fields] OR "Nonagenarians"[All Fields] OR "Octogenarians"[All Fields] OR "Octogenarian"[All Fields] OR "Centenarians"[All Fields] OR "Centenarian"[All Fields] OR "geriatric"[Title/Abstract] OR "Middle Aged"[MeSH Terms] OR "Middle Aged"[All Fields] OR "Middle Age"[All Fields])
Scopus	TITLE-ABS-KEY("Deglutition Disorders" OR "Deglutition Disorder" OR "Swallowing Disorders" OR "Swallowing Disorder" OR "swallowing difficultness" OR Dysphagia OR dysphagias OR "swallowing difficult" OR "swallowing difficulty" OR "deglutition difficulty" OR "difficult deglutition" OR "difficulty in swallowing" OR "difficulty swallowing" OR "esophageal motility disorders" OR "VVST" OR "DSQ" OR "FOIS") AND TITLE-ABS-KEY("COVID-19" OR "COVID 19" OR "COVID19" OR "Coronavirus Disease 2019" OR Pandemic OR Pandemics OR "SARS-CoV-2" OR "SARS CoV 2" OR "2019-nCoV" OR "2019 nCoV" OR "2019-nCoV" OR "2019 nCoV" OR "2019 Novel Coronavirus" OR "2019 Novel Coronaviruses") AND TITLE-ABS-KEY(Aged OR Elderly OR "80 and over" OR "Oldest Old" OR Nonagenarian OR Nonagenarians OR Octogenarians OR Octogenarian OR Centenarians OR Centenarian OR geriatric OR "Middle Aged" OR "Middle Age")
Web of Science	TS=("Deglutition Disorders" OR "Deglutition Disorder" OR "Swallowing Disorders" OR "Swallowing Disorder" OR "swallowing difficultness" OR Dysphagia OR dysphagias OR "swallowing difficult" OR "swallowing difficulty" OR "deglutition difficulty" OR "difficult deglutition" OR "difficulty in swallowing" OR "difficulty swallowing" OR "esophageal motility disorders" OR "VVST" OR "DSQ" OR "FOIS") AND TS=("COVID-19" OR "COVID 19" OR "COVID19" OR "Coronavirus Disease 2019" OR Pandemic OR Pandemics OR "SARS-CoV-2" OR "SARS CoV 2" OR "2019-nCoV" OR "2019 nCoV" OR "2019-nCoV" OR "2019 nCoV" OR "2019 Novel Coronavirus" OR "2019 Novel Coronaviruses") AND TS=(Aged OR Elderly OR "80 and over" OR

	"Oldest Old" OR Nonagenarian OR Nonagenarians OR Octogenarians OR Octogenarian OR Centenarians OR Centenarian OR geriatric OR "Middle Aged" OR Middle Age")

2.2 SELECTION CRITERIA

The following inclusion criteria were applied: 1) articles published between the years 2019 and 2022, in view of the beginning of the dissemination of COVID-19; 2) no language restriction and 3) participants aged 60 years or older who were diagnosed with COVID-19 and presented signs/symptoms of dysphagia before, during or after diagnosis. The exclusion criteria applied were: 1) review articles of any type; 2) articles that did not describe the data of elderly patients independently and 3) articles that did not present correlations between COVID-19 and dysphagia in the target audience.

2.3 DATA ANALYSIS

After identifying the articles in the databases and filtering to exclude duplicates, the articles were independently screened by two reviewers (ADC and ALBC), in which the respective titles and abstracts were read and those that did not meet the inclusion criteria were excluded. They then compared their analyses and disagreements were resolved. In the eligibility phase, two other reviewers (SCSR and ADC) performed a reading and content analysis of the full text of the remaining articles that potentially addressed the topic. In cases of divergence, a third reviewer was available for decision making.

The articles were managed in *Rayyan* software for the exclusion of duplicate documents and blinding of the evaluators. Those that met the eligibility criteria were submitted to extraction of the following data to compose the analysis matrix: title, author, year of publication, country where the study was conducted, study design, sample size, gender, age, participants' status, pre-existing comorbidities and as a result of COVID-19, COVID-19 data such as length of hospitalization and intubation, diagnosis of dysphagia, instruments or tests used in the speech therapy evaluations, the main outcomes related to the complications of dysphagia and the interventions used. The results found were submitted to descriptive and integrative analysis, followed by discussion for synthesis of knowledge and presentation of the review in this article.

3 RESULTS

The search screened 890 studies. Of these, 518 were selected for screening, 142 were selected for full-text reading, and 42 were selected for analysis after passing the eligibility criteria,

according to the flow chart presented in Figure 1. The studies that met the eligibility criteria and were included are presented in Table 1.

The studies were published between 2020 and 2022, 50% of them in 2021 (Figure 2). Case reports (92.9%), prospective (2.4%) and retrospective (4.8%) cohort studies were included (Table 2).

Figure 1 - PRISMA flowchart of the study selection phases, according to the data collection steps.

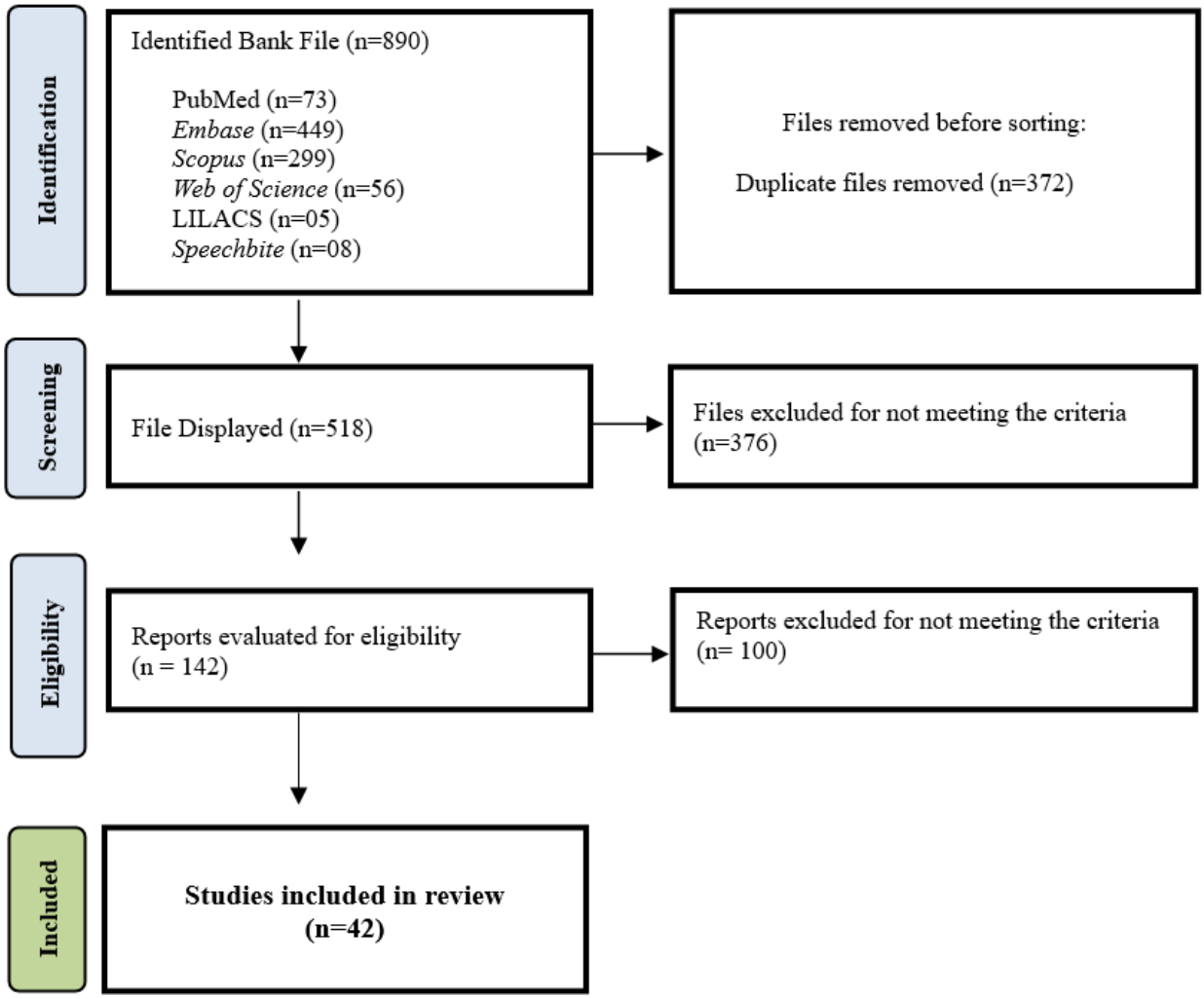


Table 1 - Articles included in the integrative review: case reports and cohort studies focusing on dysphagia associated with COVID-19.

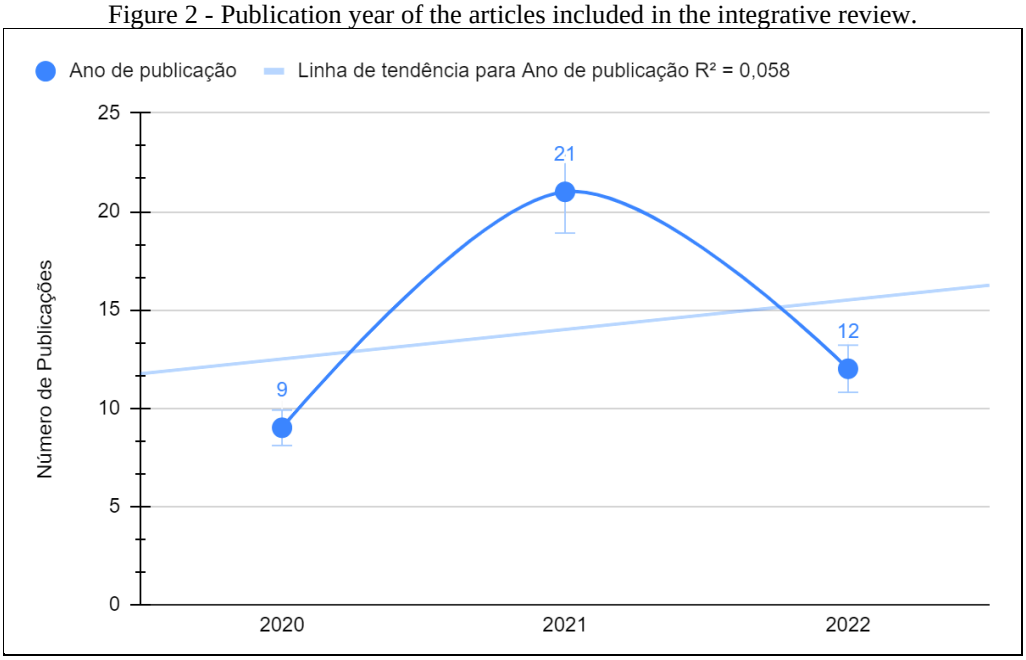
CASE REPORTS			
SAMPLE	**SCENARIO**	**ID**	**REFERENCE**
01	ICU	ND	[19]
01	ICU	ND	[20]
01	ND	ND	[21]
01	ICU	Yes	[22]
01	ICU	ND	[23]
01	ICU	ND	[24]
01	Ambulatory	ND	[25]

01	Infirmary	ND	[26]
01	ND	ND	[27]
01	ICU	Yes	[28]
01	ICU	ND	[29]
01	Infirmary	Yes	[30]
01	ICU	Yes	[31]
01	ILPI	Yes	[32]
01	ND	Yes	[33]
01	ND	Yes	[34]
01	ND	No	[35]
01	ICU	Yes	[36]
01	ICU	Yes	[37]
01	ICU/Nursing/Ambulatory	Yes	[38]
01	Infirmary	Yes	[39]
01	ICU	Yes	[40]
01	Infirmary	ND	[41]
01	Infirmary	ND	[42]
01	Infirmary	ND	[43]
02	ICU	Yes	[44]
01	ND	ND	[45]
01	ICU	Yes	[46]
01	ICU/Nursing/Ambulatory	Yes	[47]
01	Infirmary	Yes	[48]
01	ICU	ND	[49]
01	Infirmary	ND	[50]
01	Infirmary	ND	[51]
01	ND	Yes	[52]
01	ND	Yes	[53]
01	ICU	Yes	[54]
01	ICU	Yes	[55]
01	Infirmary	ND	[56]
01	ICU	ND	[57]
	COHORT STUDIES		
SAMPLE	**SCENARIO**	**ID**	**REFERENCE**
124	Infirmary	ND	[58]
54	Infirmary	ND	[59]
81	Infirmary	Yes	[60]

ND = Not Described; ICU = Intensive Care Unit; ID = Implications of Dysphagia; ILPI = Long-Stay Institution for the Elderly.

Regarding the location of the elderly during the studies, it was found that 43.9% were hospitalized in Intensive Care Units (ICU), 36.6% in ward beds, 7.3% in outpatient care, and only 2.4% in Long-Stay Institutions for the Elderly (LTCF), as shown in Table 1.

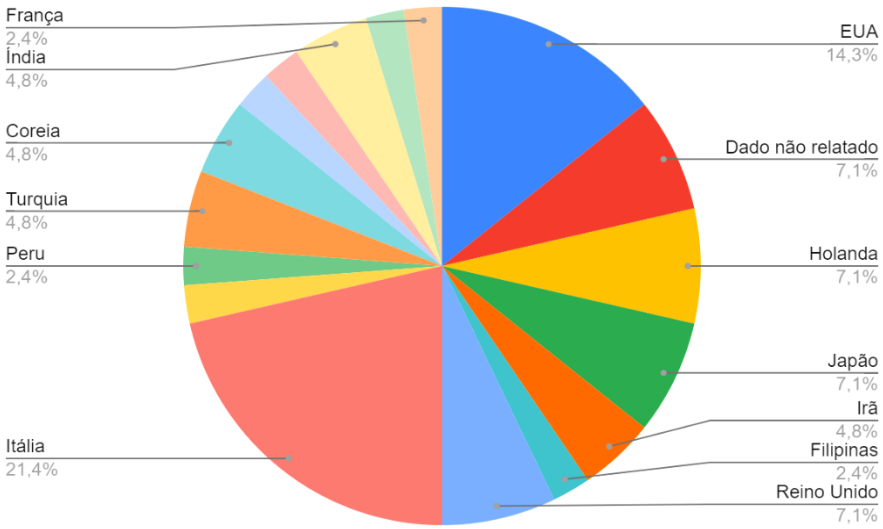
Figure 2 - Publication year of the articles included in the integrative review.



Caption: Circle: Year of publication, Line: Trend line for the publication year

Most of the studies were published in the European continent (42.8%), followed by Asia (31.1%), and America (19.1%). It is important to highlight that none of the studies included in the analysis was published in Brazil, as evidenced in Figure 3.

Figure 3 - Geographical distribution of the publications of the studies included in the integrative review.



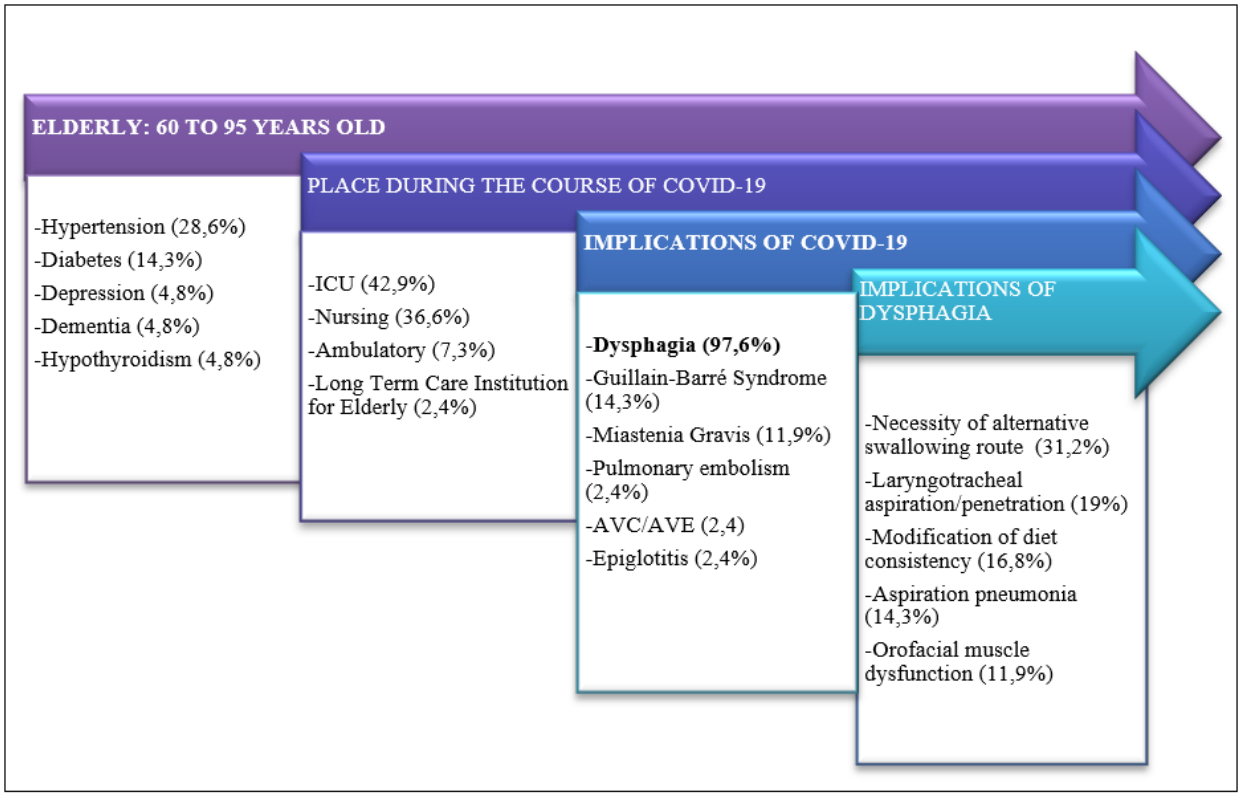
3.1 SAMPLE PROFILE

The sample comprised 298 elderly individuals, aged between 60 and 95 years, with a mean of 70.5 years. There was a prevalence of male participants (51.8%). It is noteworthy that only one study did not separate the sample by sex[59].

As for the data related to the course of COVID-19 in the participants, 54.8% of the elderly remained hospitalized for more than 10 days, 31.0% required orotracheal intubation, and 14.3% remained in this condition for more than 10 days. These results suggest a high severity of the disease in this elderly population.

Many elderly presented pre-existing comorbidities and as a result of COVID-19 infection (Figures 4 and 5; Table 2). The prevalence of Hypertension (28.6%) and Diabetes Mellitus (14.3%) among the elderly before the diagnosis of COVID-19, and diseases such as Guillain-Barré Syndrome (14.3%) and Myasthenia Gravis (11.9%) after the diagnosis of COVID-19 stand out.

Figure 4 - Summary of the profile of the elderly participants in the studies included in the analysis.



A prevalence of dysphagia implications was found in male participants, most notably the need for an alternative feeding route (n=11), laryngeal penetration/aspiration (n=6), as well as Guillain-Barré Syndrome caused by COVID-19, which generated dysphagia in six seniors and the need for diet consistency modification (n=5) (Figure 4).

Table 2 - Implications of dysphagia in elderly patients, divided by gender.

IMPLICATIONS OF DYSPHAGIA	N	SEX	
		Male 60-87 years old	Female 60-95 years old
Sample	298		
1. Need for alternative feeding route	13	11	2
2. Laryngotracheal penetration/aspiration	8	6	2
3. Need for modification of the consistency of the diet	7	5	2
4. Aspiration pneumonia	5	3	2
5. Poor control of the oropharyngeal phase	5	4	1
6. Dysfunction in the pharyngeal musculature	5	4	1
7. Dysfunction in the orofacial muscles	5	4	1
8. Absence of cough reflex	4	3	1
9. High risk of bronchoaspiration	4	2	2
10. Absence/reduction of laryngeal sensitivity	4	4	-
11. Absence of cough reflex	3	3	-
12. Cough	2	1	1
13. Sialorrhea	2	1	1
14. Wet Voice	1	1	-
15. Difficulty in chewing	1	1	-
16. Difficulty swallowing liquids	1	1	-
17. Increase in oral transit time	1	1	-
18. Taste alteration/loss of taste	1	1	-
19. Weight loss	1	-	1
20. Reduced laryngeal elevation	1	-	1
21. Pain/discomfort when swallowing	1	-	1

Table 2 shows the presence of dysphagia implications in elderly patients diagnosed with COVID-19. However, it is necessary to consider possible limitations in the representativeness of the data, such as the sample size, the data collection methodology, and the lack of description of the severity of dysphagia and its implications. On the other hand, the data presented in the table are useful to identify the most common implications of dysphagia in older adults with COVID-19, as well as the differences between male and female sexes.

Regarding the data that related COVID-19 with dysphagia, 97.6% of the sample presented dysphagia due to the course of the disease and 7.1% already had a previous diagnosis of dysphagia. Only 47.6% of the studies described the implications of dysphagia in the elderly, such implications are shown in table 3.

Table 3 - List of pre-existing and COVID-19-related comorbidities, with their respective percentages.

COMORBITIES	
PRE-EXISTING	**POST-COVID-19**
1. **Hypertension (28.6%)** **2.** **Diabetes Mellitus (14.3%)** **3.** Hypothyroidism (4.8%) **4.** Depression (4.8%) **5.** Dementia (4.8%) **6.** Anxiety (2.4%) **7.** Prostate Cancer (2.4%) **8.** Ischemic cardiomyopathy (2.4%) **9.** Advanced Fronto temporal and vascular dementia (2.4%) **10.** Diaphragm dysfunction (2.4%) **11.** Dyslipidemia (2.4%) **12.** Parkinson's Disease (2.4%) **13.** Chronic kidney disease (2.4%) **14.** Atrial fibrillation (2.4%) **15.** Bilateral hydronephrosis (2.4%) **16.** Hypercholesterlemia (2.4%) **17.** Hyperlipidemia (2.4%) **18.** HIV (2.4%) **19.** Cerebral infarction (2.4%) **20.** Chronic Heart Failure (2.4%) **21.** Leukopenia (2.4%) **22.** Multiple Myeloma (2.4%) **23.** Diabetic nephropathy (2.4%) **24.** Obesity (2.4%) **25.** Subpelvic Bilteral Ureteral Obstruction (2.4%) **26.** Osteoporosis (2.4%) **27.** Bullous pemphigoid (2.4%) **28.** Mitral valve prolapse (2.4%) **29.** Thymoma (2.4%) **30.** Bipolar Disorder (2.4%)	▪ **Dysphagia (97.6%)** ▪ **Guillain-Barré Syndrome (14.3%)** ▪ **Myasthenia Gravis (11.9%)** ▪ Acute Respiratory Distress Syndrome (4.8%) ▪ STROKE/LVA (2.4%) ▪ Choreiform movement disorder (2.4%) ▪ Acute Inflammatory Demyelinating Polyneuritis (2.4%) ▪ Polyneuromyopathy (2.4%) ▪ Acute Inflammatory Demyelinating Polyneuritis (2.4%) ▪ Multineuropathy due to COVID-19 infection (2.4%) ▪ Chronic Respiratory Disease (2.4%) ▪ Compromise of cranial nerves IX, X and XII (2.4%) ▪ Pulmonary embolism (2.4%) ▪ Cranial Multineuropathy (2.4%) ▪ Pseudo Bulbar Paralysis (2.4%) ▪ Acute parotitis (2.4%) ▪ Submandibular sialadenitis (2.4%) ▪ Boerhaave Syndrome (2.4%) ▪ Restless legs syndrome (2.4%) ▪ Pneumonia by COVID (2.4%) ▪ Restless legs syndrome (2.4%) ▪ Pneumonia by COVID (2.4%) ▪ Bilateral Tapia Syndrome (2.4%) ▪ Epiglotitis (2.4%) ▪ COPD (2.4%) ▪ Severe esophagitis (2.4%) ▪ Superficial Esophagitis dissecans (2.4%) ▪ Retropharyngeal abscess (2.4%) ▪ Immune Inflammatory Myositis (2.4%)

COPD = Chronic Obstructive Pulmonary Disease

Table 3 highlights the impact of COVID-19 on health conditions. There is an increase in the prevalence of neurological diseases in post-COVID-19 compared to pre-COVID-19, suggesting that virus infection may adversely affect the nervous system.

Interestingly, the most frequent pre-existing comorbidities were hypertension (28.6%) and diabetes mellitus (14.3%), both associated with an increased risk of cardiovascular disease and other chronic complications. Pre-existing neurological diseases, such as depression, dementia, brain infarction, bipolar disorder, and Parkinson's disease, represent a smaller portion of the comorbidities (14.0% when adding them all together).

On the other hand, the most frequent post-COVID-19 comorbidities were dysphagia (97.6%), Guillain-Barré syndrome (14.3%) and myasthenia gravis (11.9%), which are related to neurological complications.

Comparing the prevalences of neurological diseases before and after COVID-19, an increase in the number of cases is observed. The total prevalence of neurological diseases increased from 14.0% pre-COVID-19 to 55.0% post-COVID-19 (excluding dysphagia). This suggests an association between COVID-19 and the development or worsening of neurological conditions in affected patients.

These data indicate that neurological and respiratory complications are the most frequent among COVID-19 patients who develop dysphagia, and that dysphagia can have serious health implications for patients. This highlights the importance of careful swallowing assessment and appropriate management of dysphagia in patients with COVID-19 to avoid serious complications and improve the quality of life of these patients.

The signs of dysphagia appeared at different times, some seniors presented with dysphagia before the diagnosis of COVID-19, others presented during diagnosis, persisting post-COVID-19, and there was one report of a senior who presented with dysphagia as a result of the COVID-19 vaccine.

3.2 IMAGING TESTS AND QUESTIONNAIRES IN THE EVALUATION OF DYSPHAGIA IN THE ELDERLY

Dysphagia is a common problem in the elderly and can cause a number of complications, including malnutrition and aspiration pneumonia. To evaluate this condition, some imaging tests are used, such as Videoendoscopy of Deglutition (VED) and Videofluoroscopy of Deglutition (VFD). The studies included in the review showed that only a small portion of these studies (16.7% for VED and 7.1% for VFD) used these exams to evaluate swallowing in the elderly[22,38,40,44,46-48].

The use of questionnaires and scales in the evaluation of dysphagia is decisive to understand its severity, impact on the patient's life, and treatment efficacy. However, only 9.5% of the studies included these specific tools, such as the *Functional Oral Intake Scale (FOIS)* (2.4%)[54]*Gugging Swallowing Screen (GUSS)* (2.4%)[54]*Penetration Aspiration Scale (PAS)* (2.4%)[31,48]*Eating Assessment Tool (EAT-10) (2.4%)*[48] and *Dysphagia Severity Rating Scale (DSRS)* (2.4%)[54]. This finding highlights the incipient insertion of these scales in assessment protocols and the need to include more of these tools in the care and future research in order to improve care in the understanding of dysphagia, compare results and raise the quality of studies and the level of evidence.

Early intervention in dysphagia is extremely important, considering the range of implications it can bring to the patient, especially in the elderly. Few studies described the

interventions adopted in each case. Among those that described it was necessary in 31.0% of the cases to use an alternative way of feeding, the need for modification in the consistency of the oral diet was adopted in 19% of the cases and the referral to speech rehabilitation was done in 11.9% of them.

A single study (2.4%) presented data that were collected by a speech therapist[44]In contrast, 42.9% of the selected studies directly presented medical professionals among those responsible for collecting and describing the data.

4 DISCUSSION

This review was conducted considering the importance of knowledge about dysphagia in making therapeutic decisions involving the effective rehabilitation of patients, in view of the impact that difficulties in the proper functioning of swallowing bring to quality of life and mortality rates among the elderly.

It is known that the elderly have a higher risk of developing dysphagia due to diseases that naturally affect swallowing, such as stroke, amyotrophic lateral sclerosis, Parkinson's disease, among other diseases whose prevalence increases with age. Recently, with the pandemic of COVID-19 and the classification of the elderly as a population group at risk, dysphagia has been frequently associated with this disease as well. To better care for this vulnerable group of patients, health care professionals need to pay attention to risk assessment for dysphagia, the prior presence of dysphagia, protocols for dysphagia screening, and have a working knowledge of its pathophysiology[5,61,62].

It is necessary to be aware of the fact that elderly patients with COVID-19 may present with both typical and atypical symptoms, especially those with multiple comorbidities. They may not present with fever, cough or chest discomfort, so atypical presentations may be a problem and result in a delay in diagnosis. Furthermore, swallowing function in the elderly is influenced by various sensory and motor declines, and they may present with anosmia or dysphagia even before being infected with COVID-19[16,63,64].

The results of this review showed a prevalence of male participants, aged between 60 and 86 years. As a result, the greatest amount of dysphagia implications were also found among men. According to the Special Epidemiological Bulletin of the Ministry of Health (2021), elderly men with one or more comorbidities are more likely to develop severe cases of the disease and were the most affected by COVID-19, with a higher mortality rate.

It was possible to observe that some elderly required Orotracheal Intubation (OTI) and remained in this condition for more than ten days. It is common in the severe form of COVID-19 to need respiratory support with OTI and mechanical ventilation. However, this is a procedure with a high potential for negative consequences and is a major risk factor for the development of dysphagia[65].

Treatment of dysphagia includes devices that are used as an alternative feeding route and compensatory and therapeutic strategies with the goal of providing safe oral feeding, ensuring nutritional intake and maximizing quality of life[66]. The results showed the need for alternative feeding in many elderly people and a considerable portion of the population was admitted to ICUs.

Patients who develop swallowing disorders during their ICU stay are more likely to have malnutrition, dehydration, aspiration pneumonia, and take longer to initiate oral intake, increasing dependence on enteral nutrition. The literature emphasizes that patients undergoing prolonged OTI and with risk factors for dysphagia and aspiration should be assessed early[65,66].

Individuals coming out of a long ICU stay may also have difficulties in coordinating breathing and swallowing due to trauma to the oropharynx and larynx, acquired muscle weakness, and gastroesophageal reflux. And, especially in the elderly population, there is an association between sarcopenia and dysphagia that may maximize these complications[67].

The COVID-19 infection causes repercussions on the cranial nerves and commonly results in a loss of smell and/or taste, bringing damages such as inadequate salivation, inefficient bolus preparation, slowed oral transit, sensitivity alterations, and decreased eating pleasure. There are also motor alterations that directly affect the muscles involved in swallowing[8].

Among the articles included in this review, about 20 different implications of dysphagia among the elderly were described. The most frequently mentioned were: the need for an alternative feeding route, the presence of laryngotracheal penetration/aspiration, the need to change the consistency of the diet, aspiration pneumonia, and dysfunctions in the orofacial and pharyngeal muscles. Other implications that affected a smaller number of elderly were: difficulty in elevation and laryngeal sensitivity, coughing, sialorrhea, wet voice, increased oral transit time, discomfort when swallowing, taste alteration or loss of taste, difficulty swallowing liquids, and weight loss.

Some patients underwent imaging tests, such as VFD and VED. There is evidence to suggest that instrumental evaluation of the swallowing mechanism should be considered, considering the multifactoriality of dysphagia. These tools allow objective measurements of time, pressure, force, range of motion of structures, detection of the risk or presence of aspiration, airway protection, and, in the case of VED, pharyngolaryngeal sensitivity[5,66].

The frequency of performance of EDV in this review may be related to the ease of transporting the equipment, the possibility of performing the exam at the patient's bedside, and for being an easy method to perform, with low cost and no exposure to radiation compared to VFD.

It was evident that diseases such as Guillain-Barré Syndrome and Myasthenia Gravis occurred among the elderly after the COVID-19 diagnosis, especially among the male participants.

The evaluation and treatment of dysphagia involve several dimensions of the patient and require a multidisciplinary approach. Therefore, it is important to have a speech therapist in the field to follow important steps concerning his or her professional performance. Among them, confirming the presence and defining the type of swallowing alteration, checking its integrity and safety, and indicating the degree of risk or the presence of laryngotracheal penetration/aspiration, whether silent or apparent[5].

It was observed that few studies used questionnaires and/or scales related to dysphagia; these have the objective of guiding the phonoaudiological performance and guaranteeing an evidence-based care. Besides that, only one study declared the participation of a speech therapist in the production of data.

It was also pointed out that less than half of the studies brought to the reader the implications of dysphagia. Some hypotheses that may be related to the results presented are the lack of speech therapists on the team, the little knowledge about dysphagia by some health professionals, and the focus on other symptoms related to COVID-19 that directed the studies.

Taking into account COVID-19 and all its implications, including swallowing, favors the structuring of health services and the positioning of the team to provide efficient support in all contexts of patient care. Besides reducing costs, it promotes hospital discharge in less time, considerably improves the quality of life and announces a good rehabilitation prognosis, especially for the most vulnerable patients, such as the elderly.

5 CONCLUSION

Our integrative review reveals that a significant proportion of studies still do not use standardized methods, such as questionnaires and imaging tests, to diagnose and classify dysphagia in the elderly with COVID-19. This fact underscores the urgency of developing and implementing screening protocols, as well as training professionals to identify, classify, and treat swallowing disorders.

It is important to note that only 47.6% of the reviewed studies exposed the consequences of dysphagia, despite its remarkable prevalence. The most common implications included the need

for alternative feeding, laryngotracheal penetration/aspiration, adjustment in diet consistency, aspiration pneumonia, and dysfunction in the orofacial and pharyngeal muscles.

In-depth awareness about diagnosis and implications of dysphagia is essential for current clinical practice, as it directly influences decisions regarding effective patient rehabilitation. Identifying the connection between COVID-19 and dysphagia is indispensable, as it benefits the organization of health care services, guides professional staff, reduces mortality rates, reduces hospital costs, and maximizes the quality of life of the affected elderly.

Thus, we emphasize the need for future research to properly detail the sample profile and clinical setting, and to include appropriate diagnostic procedures. These actions will mitigate the risks of bias and increase the quality of evidence, allowing for more robust inferences and more reliable generalization of results.

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