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# Presbyphagia and oropharyngeal dysphagia in older adults: a scoping review protocol

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## **Presbyphagia and oropharyngeal dysphagia in older adults: a scoping review protocol**

### ***Presbifagia e disfagia orofaríngea em pessoas idosas: um protocolo de revisão de escopo***

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#### **Author contributions**

Francelise Pivetta Roque: conceptualization, methodology, development of the search strategy, manuscript drafting, critical revision of the manuscript, and supervision of the study.

Ana Beatriz Ferreira Monteiro: methodology refinement, development of the search strategy, study selection, and manuscript drafting.

Thais Coelho Alves: review of the search strategy, methodological review, and critical revision of the manuscript.

All authors approved the final version of the manuscript.

The authors declare that they have no conflicts of interest related to this study.

### **Data availability statement**

No datasets were generated or analyzed for this study protocol. The data that will support the findings of the scoping review will be derived from publicly available sources and will be presented in the final publication.

## Abstract

**Introduction:** Swallowing in older adults is often poorly understood in the literature due to the presence of overlapping terms such as presbyphagia and oropharyngeal dysphagia. Some studies suggest that aging causes dysphagia, while others distinguish between physiological changes associated with aging and pathological conditions. This inconsistency may compromise the interpretation of scientific evidence and clinical decision-making. In this context, it is essential to clarify definitions and relationships between these concepts, providing a more precise basis for healthcare practice. Furthermore, this discussion involves ageism and its influence on research and clinical practice in dysphagia. **Objective:** To map and describe the available scientific literature on aging and swallowing, focusing on how presbyphagia and oropharyngeal dysphagia are defined, related, assessed, and theoretically grounded. **Methods:** This is a scoping review protocol conducted according to the methodology of the Joanna Briggs Institute (JBI) and reported following the PRISMA-ScR guidelines. Studies involving older adults ( $\geq 60$  years) addressing the relationship between aging and swallowing will be included, with a focus on presbyphagia and oropharyngeal dysphagia, considering definitions, conceptual relationships, assessment methods, and theoretical foundations, without restrictions regarding language, publication period, or context. Searches will be conducted in LILACS; MEDLINE (via PubMed); Embase; CINAHL; Scopus; PEDro; CENTRAL; and CDSR, as well as in grey literature, using adapted strategies. Study selection and data extraction will be performed by two independent reviewers, with disagreements resolved by consensus or by a third reviewer. Methodological quality will be assessed using the Mixed Methods Appraisal Tool (MMAT), and data will be synthesized descriptively, with presentation in tables, narrative summaries, and a PRISMA-ScR flow diagram.

**Keywords:** Deglutition; Deglutition Disorders; Aged; Aging; Presbyphagia; Oropharyngeal dysphagia.

## Resumo

**Introdução:** A deglutição em adultos mais velhos é frequentemente mal compreendida na literatura, devido à presença de termos sobrepostos, como presbifagia e disfagia orofaríngea. Alguns estudos sugerem que o envelhecimento causa disfagia, enquanto outros diferenciam mudanças fisiológicas relacionadas ao envelhecimento e condições patológicas. Essa inconsistência pode comprometer a interpretação das evidências científicas e a tomada de decisão clínica. Nesse contexto, torna-se necessário esclarecer definições e relações entre conceitos, fornecendo subsídios precisos para a prática em saúde. Além disso, essa discussão envolve o etarismo e sua influência na pesquisa e prática clínica em disfagia.

**Objetivo:** Mapear e descrever a literatura científica disponível sobre envelhecimento e deglutição, com foco em como presbifagia e disfagia orofaríngea são definidas, relacionadas, avaliadas e fundamentadas teoricamente. **Métodos:** Trata-se de um protocolo de revisão de escopo conduzido de acordo com a metodologia do Joanna Briggs Institute (JBI) e reportado de acordo com as diretrizes PRISMA-ScR. Serão incluídos estudos com adultos mais velhos ( $\geq 60$  anos) que abordem a relação entre envelhecimento e deglutição, com foco em presbifagia e disfagia orofaríngea, considerando definições, relações conceituais, métodos de avaliação e fundamentos teóricos, sem restrições quanto ao idioma, período de publicação ou contexto. As buscas serão realizadas nas bases LILACS; MEDLINE (via PubMed); Embase; CINAHL; Scopus; PEDro; CENTRAL; e CDSR, além de literatura cinzenta, com estratégia adaptada. A seleção dos estudos e a extração de dados serão realizadas por dois revisores independentes, com resolução de divergências por consenso ou terceiro revisor. A qualidade metodológica será avaliada pela ferramenta Mixed Methods Appraisal Tool (MMAT), e os dados serão sintetizados de forma descritiva, com apresentação em tabelas, narrativas e diagrama PRISMA-ScR.

**Palavras chave:** Deglutição; Transtornos da deglutição; Idoso; Envelhecimento; Presbifagia; Disfagia orofaríngea.

## Introduction

Population aging is increasing worldwide. According to the World Health Organization (WHO), one of the major challenges in addressing this phenomenon is that many perceptions about older adults are still based on stereotypes. This limits the formulation of problems, research questions, and innovative solutions in healthcare.<sup>1,2</sup> Healthcare for older adults requires evidence-based practice, which integrates scientific evidence, clinical expertise, and patient preferences to support individualized decision-making.<sup>3</sup>

In this context, scoping reviews have become an effective method for mapping concepts, evidence, and knowledge gaps, particularly in topics characterized by contradictions, such as aging and swallowing.<sup>4</sup> Among the topics that require greater conceptual and methodological rigor, oropharyngeal dysphagia in older adults stands out as a common condition associated with risks such as pneumonia, malnutrition, dehydration, and reduced quality of life.<sup>5,6</sup>

Although frequently attributed to aging, this relationship is not yet consensual in the literature. Some authors<sup>7</sup> argue that oropharyngeal dysphagia is caused by aging, sometimes describing presbyphagia - which refers to physiological changes in swallowing observed in healthy older adults<sup>8</sup> - as an etiology of oropharyngeal dysphagia, a swallowing disorder compensated by physiological reserves, and a synonym of dysphagia.<sup>9</sup> The literature also associates sarcopenia and frailty—recognized causes of dysphagia—with aging, reinforcing this assumption.<sup>10-11</sup> However, more recent studies have demonstrated compensatory changes in swallowing among healthy older adults, distinct from dysphagia, suggesting that aging may involve adaptive processes.<sup>12-14</sup> Since OD is a symptom, attributing it to aging frames aging itself as a disease, contradicting current geriatrics and gerontology paradigms.<sup>2,15</sup> During the Decade of Healthy Ageing proposed by the World Health Organization, there were discussions about classifying old age as a disease in the International Classification of Diseases (ICD), which generated strong social and scientific reactions.<sup>16</sup> A previous publication<sup>15</sup> presented a critical analysis of contemporary proposals related to presbyphagia,<sup>8</sup> highlighting methodological limitations and conceptual inconsistencies in the literature, particularly regarding the direct association between aging and dysphagia. These findings reinforce the relevance of the topic and the need for a scoping review that systematically maps

concepts, definitions, and relationships between aging, presbyphagia, and oropharyngeal dysphagia, contributing to the strengthening of evidence-based care in older adults.

This discussion also encompasses ethical and political dimensions. Ageism, even among healthcare professionals, may distort the interpretation of evidence and influence clinical decision-making.<sup>2,17</sup>

In this context, this scoping review protocol was developed to map the concepts of presbyphagia, oropharyngeal dysphagia, and aging in the current literature, contributing to a more precise and ethically grounded understanding of these relationships. Scoping reviews are particularly suitable for mapping concepts and clarifying definitions, especially in fields characterized by conceptual divergence and interdisciplinarity, as well as for identifying knowledge gaps without assessing effectiveness.

This study aims to strengthen evidence-based care, avoiding underdiagnosis and the medicalization of aging.

## **Methods**

This study does not require submission to a Research Ethics Committee, as it is a scoping review conducted according to the Joanna Briggs Institute (JBI) methodology. The review will follow the five stages proposed by JBI: (1) identification of the research question, (2) identification of relevant studies, (3) study selection, (4) data charting, and (5) collating, summarizing, and reporting the results. The reporting will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines.<sup>18</sup>

The protocol was prospectively registered at the Open Science Framework (OSF).<sup>19</sup>

## ***Research questions***

The research questions were developed based on the Population, Concept, and Context (PCC) framework, used as a mnemonic as recommended by the Joanna Briggs Institute. The guiding questions are:

- Is presbyphagia defined as normal or altered swallowing?
- How is oropharyngeal dysphagia conceptualized in older adults?
- What relationship is established in the literature between presbyphagia and oropharyngeal dysphagia in older adults?
- How are aging, old age, and older adults defined?
- How is the concept of “healthy older adults” defined and operationalized, and which criteria are used for this characterization?
- Is aging described as a cause of oropharyngeal dysphagia in the literature?
- What types of evidence and methodological approaches support these assumptions?
- Which assessment and diagnostic procedures are used for presbyphagia, dysphagia, and general health in older adults, and how are they interpreted?
- Do these procedures present evidence of validity?
- What is the methodological robustness of the available evidence?

## ***Eligibility criteria***

Eligibility criteria were defined according to the PCC framework described above.

- **Population:** older adults ( $\geq 60$  years), considering international variations.

- **Concept:** the relationship between aging and swallowing, including presbyphagia and oropharyngeal dysphagia, as well as conceptual definitions, etiological factors, pathophysiology, assessment and diagnostic methods, and scientific findings on the topic.
- **Context:** any setting (community, outpatient care, hospital/ICU, or long-term care facilities), with no geographical or level-of-care restrictions, including multidisciplinary perspectives.

Studies meeting these criteria will be included regardless of language, publication period, or country.

Studies will be excluded if they: (1) do not include older adults; (2) do not address swallowing or its disorders; (3) are conducted exclusively in animals; or (4) lack an abstract for initial screening.

### **Search strategy**

The search strategy was developed based on the PCC approach, prioritizing high sensitivity and broad terminological coverage. Controlled vocabulary (MeSH, DeCS, Emtree) and free-text terms were combined using Boolean operators (AND/OR).

Population-related terms included descriptors such as *Aged*, *Aged, 80 and over*, and *Frail Elderly*, as well as free-text terms (e.g., elderly, oldest old, frail older adults, aging, senescence). Concept-related terms included descriptors and keywords related to swallowing (*Deglutition*, *Swallowing*) and swallowing disorders (*Deglutition Disorders*, *Dysphagia*), combined with specific terms (oropharyngeal dysphagia, presbyphagia), using truncation and title/abstract field searching ([tiab]).

Searches will be conducted without date restrictions in the databases listed in Table 1. The search strategy will be adapted for each database, considering its specific controlled vocabulary (e.g., MeSH, Emtree, CINAHL Headings) and platform-specific syntax. Reference lists of included studies will be screened to identify additional relevant studies. Grey literature will also be considered, including institutional repositories, theses, and dissertations. When necessary, authors will be contacted to obtain accessible versions of studies.

**Table 1. Databases selected for the study**

Type of source	Databases
Indexed literature	LILACS; MEDLINE (via PubMed); Embase; CINAHL; Scopus; PEDro; Cochrane CENTRAL; Cochrane Database of Systematic Reviews (CDSR)
Grey literature	

The search strategy was initially developed for MEDLINE (via PubMed) (Table 2) and will subsequently be adapted for the other databases, considering differences in controlled vocabulary (e.g., MeSH, Emtree, CINAHL Headings) and platform-specific syntax.

**Table 2. PubMed search strategy**

#	Search strategy
1	"Aged"[Mesh] OR Elderly OR "Aged, 80 and over"[Mesh] OR Oldest Old OR "Frail Elderly"[Mesh] OR Elderly, Frail OR Frail Elders OR Elder, Frail OR Elders, Frail OR Frail Elder OR Frail Older Adults OR Adult, Frail Older OR Adults, Frail Older OR Frail Older Adult OR Older Adult, Frail OR Older Adults, Frail OR Functionally-Impaired Elderly OR Elderly, Functionally-Impaired OR Functionally Impaired Elderly OR "aging"[MeSH Terms] OR Biological Aging OR Aging, Biological OR Senescence
2	"Deglutition"[MeSH] AND (elder*[tiab] OR ageing[tiab] OR aging[tiab] OR presby*[tiab])
3	"Deglutition Disorders"[MeSH] AND (oropharyngeal[tiab] OR presby*[tiab])
4	"oropharyngeal dysphagia"[tiab] OR presbyphagia[tiab]
5	#2 OR #3 OR #4
6	#1 AND #5

**Note.** Not all entry terms associated with the MeSH descriptors "deglutition" and "deglutition disorders" were included, as automatic mapping in biomedical databases retrieves records indexed under these terms and their hierarchical variations. Additionally, the hybrid strategy using widely

*employed free-text terms ensures adequate coverage while avoiding excessive redundancy and increased noise. Pilot testing indicated that including additional entry terms did not significantly increase retrieval. Given the exploratory nature of scoping reviews, sensitivity was prioritized over specificity, with refinement to occur during the screening stages.*

### **Study selection**

All retrieved records will be imported into EndNote for duplicate removal and then exported to Rayyan for screening.

Study selection will be conducted in two stages: (1) title and abstract screening and (2) full-text review. In both stages, two independent reviewers will assess the studies according to the eligibility criteria. Disagreements will be resolved by consensus or by consultation with a third reviewer.

Reasons for exclusion will be recorded at the full-text stage. When multiple publications refer to the same study, the most complete or most recent version will be included.

### **Data extraction**

Data will be extracted using a form adapted from the JBI model.<sup>20</sup> Extracted data will include study identification (author and year), country, study design, objectives, population characteristics, conceptual definitions (aging, presbyphagia, and oropharyngeal dysphagia), relationships between concepts, theoretical framework, assessment and diagnostic methods, instruments used and their validation, main findings, authors' interpretations, level of evidence (when applicable), and reported limitations.

Data extraction will be conducted by two independent reviewers. A pilot calibration will be performed to ensure consistency between reviewers. Discrepancies will be resolved by consensus or by consultation with a third reviewer. The extraction form may be refined during the process, if necessary.

Methodological quality will be assessed using the Mixed Methods Appraisal Tool (MMAT),<sup>21</sup> with the aim of describing the robustness and limitations of the evidence, without excluding studies based on quality.

The data extraction framework presented in Table 3 is intended to guide the process and may be refined during data extraction to ensure that all relevant information is captured.

**Table 3. Preliminary data extraction framework**

<b>Category</b>	<b>Variable</b>	<b>Description</b>
Study identification	Author/Year	First author and year of publication
Country	Country where the study was conducted	
Journal	Scientific journal (optional)	
Methodological characteristics	Study design	e.g., observational study, clinical trial, review, theoretical study
Study objective	Main objective as stated by the authors	
Population	Sample characteristics (e.g., age, clinical condition)	
Sample size	Number of participants (when applicable)	
Conceptual aspects	Definition of aging	How aging/old age is defined
Definition of healthy older adults	How the concept is defined and which criteria are used	
Definition of presbyphagia	Concept adopted	
Definition of oropharyngeal dysphagia	Concept adopted	
Relationship between concepts	Whether concepts are differentiated, overlapping, or considered equivalent	
Aging as a cause	Whether aging is described as a direct cause of dysphagia	

continued

**Table 3. Preliminary data extraction framework**

<b>Category</b>	<b>Variable</b>	<b>Description</b>
Theoretical framework	Theoretical references	Theories or models used
Conceptual justification	Theoretical basis supporting the definitions	
Assessment and diagnosis	Assessment methods	e.g., clinical and/or instrumental
Instruments used	e.g., videofluoroscopy, FEES, scales	
Instrument validation	Whether the instruments are reported as validated	
Results	Main findings	Key results reported
Interpretation of assessment results	How the findings from assessment procedures are interpreted	
Authors' interpretation	How the authors interpret the findings	
Evidence characteristics	Level of evidence	When applicable
Study limitations	Limitations reported by the authors	
Additional data (if applicable)		

### **Data synthesis**

The results will be presented descriptively, organized according to themes derived from the research questions. Data may be summarized in tables, charts, and narrative synthesis.

The study selection process will be reported using a PRISMA-ScR flow diagram, detailing identification, screening, eligibility, and inclusion stages.

## **Results**

The results of this scoping review will be presented descriptively, based on the included studies, and organized into themes derived from the review questions. Data will be summarized in tables, charts, and narrative synthesis.

The study selection process will be reported using a PRISMA-ScR flow diagram, detailing identification, screening, eligibility, and inclusion stages.

## **Discussion**

This scoping review aims to map and describe the scientific literature on the relationship between aging and swallowing, focusing on presbyphagia and oropharyngeal dysphagia, contributing to the conceptual and theoretical understanding of these phenomena.

The findings will allow the identification of knowledge gaps, conceptual inconsistencies, and potential implications for clinical practice and future research, particularly in the context of healthcare for older adults and evidence-based practice.

Any modifications to the protocol will be clearly described and justified in the final publication, ensuring transparency and methodological rigor.

The use of artificial intelligence tools to support the development of the search strategy and organization of the protocol will be transparently reported.

## Referências

1. Organização Pan-Americana da Saúde (OPAS). Resumo - Relatório Mundial de Envelhecimento e Saúde. sobre o Idadismo. Washington: Escritório Regional para as Américas da Organização Mundial da Saúde; 2015. Disponível em: [https://iris.who.int/bitstream/handle/10665/186468/WHO\\_FWC\\_ALC\\_15.01\\_por.pdf;jsessionid=EE70A7032797AF9D9CAA7DBBD3185D33?sequence=6](https://iris.who.int/bitstream/handle/10665/186468/WHO_FWC_ALC_15.01_por.pdf;jsessionid=EE70A7032797AF9D9CAA7DBBD3185D33?sequence=6)
2. World Health Organization. World report on ageing and health [Internet]. Geneva: WHO; 2015 [cited 2019 Apr 2]. Available from: <https://apps.who.int/iris/handle/10665/186463>
3. Sackett D L. Medicina baseada em evidências: prática e ensino. 2 ed. Porto Alegre: Artmed,2003.
4. Aromataris E, Munn Z, editors. JBI Manual for Evidence Synthesis [Internet]. 2020 [citado em 20 set. 2022]. Disponível em: <http://doi.org/10.46658/JBIMES-20-01>.
5. Sociedade Brasileira de Fonoaudiologia. Respostas para Perguntas Frequentes na Área de Disfagia. [Acesso em 03 Nov 2023]. Disponível em: [https://www.sbfa.org.br/portal2017/departamentos/2\\_disfagia](https://www.sbfa.org.br/portal2017/departamentos/2_disfagia)
6. Rofes L, Arreola V , Romea M, Palomera E, Almirall J, Cabre M, et al. Pathophysiology of oropharyngeal dysphagia in the frail elderly. *Neurogastroenterol Motil.* 2010; 22: 851–e230.
7. Baijens LW, Clavé P, Cras P, Ekberg O, Forster A, Kolb GF, Leners JC, Masiero S, Mateos-Nozal J, Ortega O, Smithard DG, Speyer R, Walshe M. European Society for Swallowing Disorders - European Union Geriatric Medicine Society white paper: oropharyngeal dysphagia as a geriatric syndrome. *Clin Interv Aging.* 2016 Oct 7;11:1403-1428. doi: 10.2147/CIA.S107750.
8. Robbins J, Hamilton JW, Lof GL, Kempster GB. Oropharyngeal swallowing in normal adults of different ages. *Gastroenterology.* 1992; 103: 823–829.
9. Ambiado-Lillo MM. Presbyphagia: A Conceptual Analysis of Contemporary Proposals and Their Influences on Clinical Diagnosis. *Dysphagia.* 2024 Oct;39(5):765-771. doi: 10.1007/s00455-023-10658-y

10. Clegg A, Young J, Iliffe S, Rikkert MO, Rockwood K. Frailty in elderly people. *Lancet*. 2013; 381: 752–762.
11. Lourenço R A, Perez M. Será a fragilidade e não a idade cronológica o elemento prognóstico essencial no paciente idoso com COVID-19? *Geriatr Gerontol Aging* (Online) [Internet]. 2020 Jun 30 [cited 2023 May 18]: 77-8. doi: <https://doi.org/10.5327/Z2447-21232020v14n2EDT1>
12. Nicosia MA, Hind JA, Roecker EB, Carnes M, Doyle J, Dengel GA, et al. Age effects on the temporal evolution of isometric and swallowing pressure. *J Gerontol A Biol Sci Med Sci*. 2000; 55: M634–M640.
13. Mulheren RW, Azola AM, Kwiatkowski S, Karagiorgos E, Humbert I, Palmer JB, González-Fernández M. Swallowing Changes in Community-Dwelling Older Adults. *Dysphagia*. 2018;33(6):848-856. [10.1007/s00455018-9911-x](https://doi.org/10.1007/s00455018-9911-x).
14. Mancopes R, Gandhi P, Smaoui S, Steele CM. Which physiological swallowing parameters change with healthy aging? *OBM Geriatr*. 2021;5(1):2101153. <https://doi.org/10.21926/obm.geriatr.2101153>
15. Roque, F.P., Monteiro, A.B.F., Wachholz, P.A. et al. A Letter to the Editor on Presbyphagia: A Conceptual Analysis of Contemporary Proposals and their Influences on Clinical Diagnosis. *Dysphagia* (2025). <https://doi.org/10.1007/s00455-025-10825-3>
16. Morosini L. RADIS, Velhice não é doença [homepage na Internet]. Rio de Janeiro/RJ: Fiocruz; [atualizada em 2022 Fev 01; acesso em 2022 Jun 9]. Disponível em: <http://https://radis.ensp.fiocruz.br/reportagem/velhice-nao-e-doenca>.
17. Roque, F. P., Gonçalves, S. G. R., Starosky, P., Silva, G. G. da, Lima, R. S., & Bagetti, T. Idadismo e Fonoaudiologia: quando o preconceito afeta o olhar clínico sobre a pessoa idosa. *Distúrb comun*. 2024; 35(4): e63265. <https://doi.org/10.23925/2176-2724.2023v35i4e63265>
18. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19–32. doi:10.1080/1364557032000119616

19. Roque FP, Monteiro ABF. Presbyphagia and oropharyngeal dysphagia in older adults: a scoping review protocol. OSF Registries [Internet]. 2026 Mar 26 [cited 2026 Apr 3]. Available from: <https://doi.org/10.17605/OSF.IO/PFH4M>
20. Peters MDJ, Godfrey C, Mclnerney P, Munn Z, Tricco AC, Khalil H. Scoping reviews. In: Aromataris E, Munn Z, editors. JBI manual for evidence synthesis [Internet]. Adelaide: Joanna Briggs Institute; 2024 [cited 2026 Apr 2]. Available from: <https://jbi-global-wiki.refined.site/space/MANUAL>
21. Hong QN, Pluye P, Fàbregues S, Bartlett G, Boardman F, Cargo M, et al. Mixed methods appraisal tool (MMAT) Version 2018: user guide [Internet]. Montreal (CA): University McGill; 2018 [cited 2020 June 19]. Available from: [http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/attach/127916259/mmat\\_2018\\_criteria-manual\\_2018-08-01\\_eng.pdf](http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/attach/127916259/mmat_2018_criteria-manual_2018-08-01_eng.pdf)

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