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Prevalence and Clinical Characteristics of Dysphagia Among Patients Attending Otolaryngology Clinics: A Cross-Sectional Study

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ABSTRACT: Background: Dysphagia is associated with nutritional, respiratory, and quality-of-life burden, yet nationally representative evidence describing its presentation in office-based otolaryngology is limited. This study estimated the prevalence of documented dysphagia-related otolaryngology visits and characterized associated patient and encounter features.

Methods: A cross-sectional secondary analysis used the 2015 National Ambulatory Medical Care Survey. Otolaryngology visits were identified by physician specialty. Dysphagia was defined by a reason-for-visit code for difficulty swallowing, an ICD-9-CM 787.2x diagnosis, or either criterion. Analyses incorporated national visit weights, masked strata, and provider clusters; Taylor-series linearization was used for uncertainty estimation.

Results: Among 2,487 sampled otolaryngology visits, 83 met the primary dysphagia definition. Survey-weighted prevalence was 3.82% (95% CI, 2.35%-6.16%), representing approximately 947,000 visits; reason-for-visit and diagnosis-only prevalence estimates were 2.46% and 2.34%, respectively. Dysphagia-related visits involved older patients than other visits (mean age, 60.0 vs. 48.0 years; $p < .001$), and 53.5% versus 31.2% involved patients aged 65 years or older ($p = .002$). Cancer was more frequent in dysphagia-related visits (27.7% vs. 8.1%; $p = .002$) and remained associated after

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adjustment for age and sex (adjusted odds ratio, 3.21; 95% CI, 1.41-7.29). Chronic-condition counts were higher before adjustment, whereas physician contact time was not significantly different. Conclusion: Documented dysphagia occurred in approximately one in 26 nationally represented office-based otolaryngology visits. Older age and cancer characterized the dysphagia visit population; however, sparse neurologic indicators, routine coding, and the visit-level cross-sectional design require cautious interpretation.

INTRODUCTION

Dysphagia is a disorder of the swallowing process that can involve oral preparation, oropharyngeal transfer, and/or esophageal transit. As swallowing is a process that involves sensory input, motor control, upper aerodigestive tract anatomy, and airway protection, dysphagia may be caused by neurologic disease, structural disease, malignancy, changes that occur as a result of treatment, decreased motility, frailty, or a combination of these factors (Clavé & Shaker, 2015; McCarty & Chao, 2021; Rajati et al., 2022). The symptom is clinically relevant as food and fluid intake can be challenging, but also because dysphagia has been linked to malnutrition, pneumonia, decreased quality of life, and death in vulnerable populations (Baijens et al., 2016; Banda et al., 2022; Eisenstadt, 2010; Jones et al., 2018; Rivelsrud et al., 2023). In particular, otolaryngologists are relevant to this pathway, as they evaluate the pharynx, larynx, upper aerodigestive tract, head and neck disease as well as mechanisms of airway protection that may underlie or complicate swallowing impairment (Kuhn et al., 2023; McCarty & Chao, 2021; Schindler et al., 2022).

Prevalence of dysphagia varies greatly from one study to another and is dependent on the population studied and the method used to identify dysphagia. The various types of studies (community survey, clinical cohort, health-care encounter database) capture different parts of the spectrum of swallowing impairment and so estimate rates differently (Adkins et al., 2020; Bhattacharyya, 2014; Doan et al., 2022; Hong et al., 2024; Ribeiro et al., 2024). Nearly 4.0% of U.S. adults reported swallowing difficulties during the 12 months prior to the National Health Interview Survey (NHIS) in 2012 and a large population-based survey reported that 16.1% of respondents had experienced dysphagia (Adkins et al., 2020; Bhattacharyya, 2014). More recent evidence at a national level indicates an increasing burden with an estimated annual self-reported dysphagia prevalence of 5.91% in 2022 (Hong et al., 2024). The prevalence is found to vary widely based on health-care setting and ascertainment method in systematic reviews as well (Doan et al., 2022; Rajati et al., 2022; Ribeiro et al., 2024; Rivelsrud et al., 2023).

There is still relatively scarce national evidence specific to otolaryngology. From 2007 to 2010, National Ambulatory Medical Care Survey (NAMCS) data showed that dysphagia accounted for 1.55% of all otolaryngology visits; ambulatory care for dysphagia was spread among a variety of physician specialties according to Mahboubi and Verma (2014). Given the importance of the upper-aerodigestive evaluation and fiberoptic evaluation of swallowing in otolaryngology, there is a clinical need for specialty-specific epidemiologic characterization (Mahboubi & Verma, 2014; McCarty & Chao, 2021; Schindler et al., 2022). More recent general population studies have described symptom burden, but do not provide a description of the presentation of dysphagia in office-based otolaryngology care (Adkins et al., 2020; Hong et al., 2024; Zheng et al., 2023).

The goal of the current study was to estimate the prevalence of reported dysphagia-related visits to U.S. office-based otolaryngology clinics in 2015 from the NAMCS. Secondary objectives included characterizing the demographic, clinical and encounter profile associated with visits for dysphagia; comparing the encounter profile of dysphagia visits to that of other otolaryngology visits; and determining which selected characteristics were independently associated with documentation of dysphagia. Two hypotheses were tested. First, older patients and a higher prevalence of cerebrovascular disease and cancer were anticipated, consistent with known geriatric, neurologic, and oncologic pathways (Baijens et al., 2016; Bhattacharyya, 2014; Madhavan et al., 2016). Second, the visits related to dysphagia were expected to be clinically more complex and to have a higher number of chronic conditions and longer duration of contact with the physicians. As NAMCS is cross-sectional and encounter-based, these hypotheses relate to associations rather than causation, and the prevalence measure is a proportion of visits, not unique patients.

LITERATURE REVIEW

Safe swallowing is a complex process that involves well-coordinated oral, pharyngeal, laryngeal, and esophageal function. Abnormalities at these levels can result in symptoms from inability to initiate a swallow and coughing or choking to a sensation of food being stuck and impaired bolus clearance (Clavé & Shaker, 2015; McCarty & Chao, 2021; Rajati et al., 2022). In older adults, dysphagia is associated with undernutrition, dehydration, post-aspiration respiratory morbidity and decreased health-related quality of life (Baijens et al., 2016; Banda et al., 2022; Eisenstadt, 2010; Jones et al., 2018). Downstream consequences are the reason that dysphagia is considered a clinically relevant problem as opposed to a stand-alone symptom (Banda et al., 2022; Jones et al., 2018; Rivelsrud et al., 2023).

One of the most consistent correlates of swallowing problems is age. Madhavan et al. (2016) conducted a systematic review of community-dwelling older adults and found a high level of heterogeneity with an overall prevalence of dysphagia of ~15%, with advancing age, clinical disease burden, and a decline in functional reserve being common correlates of dysphagia. The meta-analysis and systematic review of literature from Doan et al. (2022) demonstrated that the prevalence among older adults also depends on the method used to detect dysphagia (self-report, screening, clinical assessment, instrumental assessment). In addition, more recent national U.S. survey data indicate that dysphagia is more common among the older age groups (Hong et al., 2024; Zheng et al., 2023).

The neurologic pathway is another important etiologic pathway because the swallowing process involves the function of several systems, including cortical and subcortical structures, the brainstem, cranial nerves, and the neuromuscular system. Pooled evidence shows that dysphagia following stroke is common and is associated with a significantly higher risk for pneumonia, especially if aspiration occurs (Martino et al., 2005); stroke is often cited as a cause of dysphagia. Dementia and other neurologic conditions are also suspected to contribute to the burden of dysphagia in older, medically complex adults (Baijens et al., 2016; Rajati et al., 2022; Rivelsrud et al., 2023). These observations led to an examination of cerebrovascular and neurologic indicators in this analysis.

However, cancer is particularly pertinent in the field of otolaryngology as the preparation, propulsion of the bolus, clearance of the pharynx, elevation of the larynx, sensation and salivary function, and protection of the airway can all be affected by the presence of head and neck malignancy and its therapies. Current specialty guidance identifies dysphagia as a key functional concern in head and neck oncology and underscores the importance of dysphagia in evaluation, prevention, intervention, and surveillance (Kuhn et al., 2023; McCarty & Chao, 2021; Schindler et al., 2022). In the context of head and neck cancer treatment, dysphagia is a key area of focus, making cancer a potentially relevant dysphagia-related otolaryngology visit correlate.

Observed prevalence differs considerably by setting and ascertainment. Rivelsrud et al. (2023) reported that the prevalence of pooled oropharyngeal dysphagia was much higher in hospital, rehabilitation and nursing home settings than in community settings, highlighting the concentration of swallowing problems in medically complex settings. Systematic reviews, too, indicate varying prevalence rates depending on the population, and the definition of dysphagia (Doan et al., 2022; Rajati et al., 2022; Ribeiro et al., 2024). This methodological heterogeneity directly affects comparisons between population symptom surveys and office-based encounter data such as NAMCS.

To our knowledge, there is one similar national ambulatory study that is directly comparable to our results: Mahboubi and Verma (2014) studied 2007-2010 NAMCS data and determined that dysphagia accounted for 1.55% of otolaryngology visits when reported as a reason for visit. Their work demonstrated the viability of using NAMCS to quantify ambulatory burden of dysphagia but preceded the present analysis and current prevalence estimates in the general population based on symptoms and/or diagnosis of dysphagia (Adkins et al., 2020; Hong et al., 2024; Mahboubi & Verma, 2014). As such, a subsequent analysis specific to each specialty is still valuable for keeping the epidemiologic profile of dysphagia in the office-based otolaryngology practice up to date.

METHODOLOGY

Study Design and Data Source

The National Ambulatory Medical Care Survey (NAMCS) public-use file from 2015 was used to perform a cross-sectional secondary analysis. NAMCS is a nationally representative sample of nonfederal office-based physicians in the United States

and is conducted as a multistage survey. The 2015 public-use file has 28,332 sampled visits and provides data on patient characteristics, visits, chronic conditions, services received, medications prescribed, disposition, physician specialty, and variables from the survey design (National Center for Health Statistics [NCHS], 2017). Reporting was done in the format of the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) principles (von Elm et al., 2007). All prevalence estimates reflect ambulatory visits as the unit of analysis, not unique individuals.

Study Population and Outcome Definition

The analytic domain included all records for which physician specialty recode SPECR = 14, denoting otolaryngology. This resulted in 2,487 sampled otolaryngology visits. There was no age limit in the primary analysis, and a sensitivity analysis using adults only was performed.

The five reason-for-visit fields (RFV1-RFV5) and five diagnosis fields (DIAG1-DIAG5) were used to identify a visit as dysphagia-related when any RFV field indicated difficulty swallowing (NCHS, 2017; ICD-9-CM code 787.2x) or any DIAG field was 7872 for ICD-9-CM code 787.2x dysphagia. Meeting either criterion defined the primary outcome. Two definitions were analyzed separately: (1) reason-for-visit only and (2) diagnosis only. The outcome therefore reflects dysphagia-related visits rather than confirmed dysphagia in unique patients.

Variables

Demographic characteristics were age, age 65 or older, sex, imputed race/ethnicity, and primary payment type. Encounter variables included referral status, main reason for the visit, physician contact time, number of medicines prescribed, upper gastrointestinal endoscopy, referral to another doctor, follow-up appointment set or emergency referral/hospital admission. Clinical factors encompassed the overall quantity of chronic conditions recorded, in addition to indicators for cancer, history of cerebrovascular disease or stroke, Alzheimer disease or dementia, hypertension, diabetes mellitus, obesity and obstructive sleep apnea. These variables were treated as characteristics recorded during the sampled encounter rather than as incident diagnoses or confirmed causes of dysphagia.

Statistical Analysis

All national estimates included the patient-visit weight (PATWT), masked stratum (CSTRATM), and masked provider cluster (CPSUM). Otolaryngology was analyzed as a domain of the entire survey rather than as a simple random sample of the extracted records. Variances, standard errors and 95% confidence intervals were estimated using Taylor-series linearization, and 95% confidence limits for proportions were logit-transformed. To provide an indication of the empirical evidence underlying the national estimates, unweighted sample counts were reported next to the weighted estimates (Lumley, 2004; NCHS, 2017).

Design-based contrasts were used to compare weighted means and proportions. Tests were two-sided with alpha = .05, but emphasis was placed on the magnitude of the effect, 95% confidence intervals, and reliability of the estimates rather than on p values alone. A parsimonious survey-weighted logistic regression estimated associations with a dysphagia-related visit, using age (in 10-year increments), sex, and cancer. Only one dysphagia-related visit had the 'cerebrovascular disease' indicator, and therefore a stable regression coefficient could not be estimated. The adjusted differences in number of chronic conditions and physician contact time were estimated using survey-weighted linear models, with adjustment for dysphagia status, age, sex and cancer. For adjusted models, design-based sandwich covariance estimates were used (Lumley, 2004; Vittinghoff & McCulloch, 2007).

Missing values were not recoded as absence of a characteristic and were excluded variable by variable. The logistic model had complete data for all 2,487 otolaryngology visits. Estimates with a small sample size of positive sampled records (n<30) or with a relative standard error of more than 30% were considered statistically unreliable, as recommended by NCHS reliability guidance, and therefore not considered definitive findings (NCHS, 2017). The reason-for-visit-only, diagnosis-only, and adult-only definitions were used in the sensitivity analyses.

Ethical Considerations

NAMCS public-use files are deidentified and contain no direct patient or physician identifiers. The present study involved secondary analysis of publicly available data and no participant contact. No attempt was made to identify individuals, physicians, or practices. Informed consent was not applicable to this analysis of deidentified public-use data.

RESULTS

Prevalence and Outcome Ascertainment

The 2015 NAMCS contained 28,332 sampled office visits. The otolaryngology domain included 2,487 sampled visits, representing approximately 24.8 million U.S. office-based otolaryngology visits. Eighty-three sampled visits met the primary composite definition for documented dysphagia. Of these, 51 contained a dysphagia reason-for-visit code and 56 contained a dysphagia diagnosis; 24 met both criteria. The mutually exclusive documentation groups comprised 27 reason-for-visit-only visits, 24 visits documented by both sources, and 32 diagnosis-only visits (Figure 1).

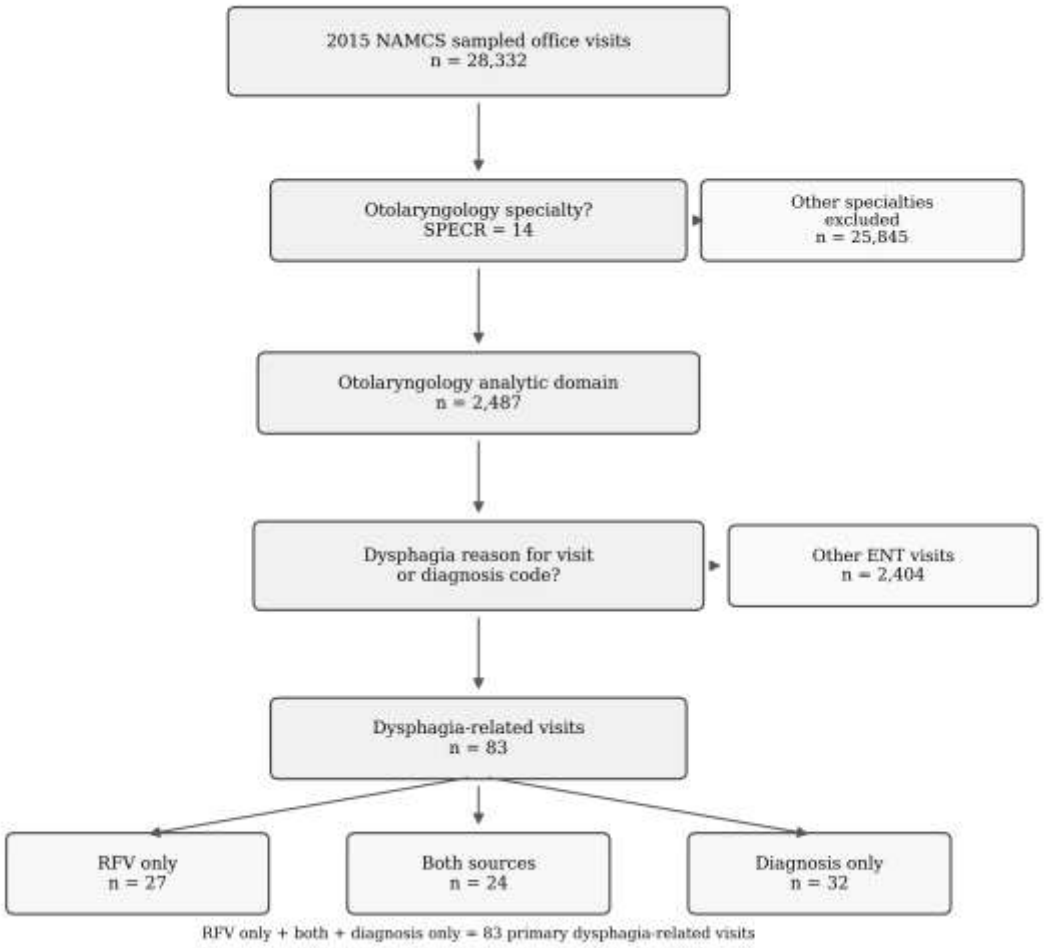

Figure 1. Construction of the otolaryngology analytic domain and dysphagia-related visit outcome.

Note. Counts are unweighted sampled visits. The final row partitions the 83 dysphagia-related visits into mutually exclusive documentation categories. ICD-9-CM = International Classification of Diseases, Ninth Revision, Clinical Modification; NAMCS = National Ambulatory Medical Care Survey; RFV = reason for visit.

The survey-weighted prevalence of dysphagia under the primary definition was 3.82% (95% CI, 2.35%-6.16%), corresponding to approximately 947,000 represented otolaryngology visits. The reason-for-visit-only prevalence was 2.46% (95% CI, 1.36%-4.39%), and the diagnosis-only prevalence was 2.34% (95% CI, 1.67%-3.27%). Restricting the analysis to adults yielded a

prevalence of 4.29% (95% CI, 2.69%-6.79%). The component estimates were similar in magnitude, supporting the use of a composite definition that captured dysphagia documented either as a presenting complaint or as a diagnosis (Figure 2).

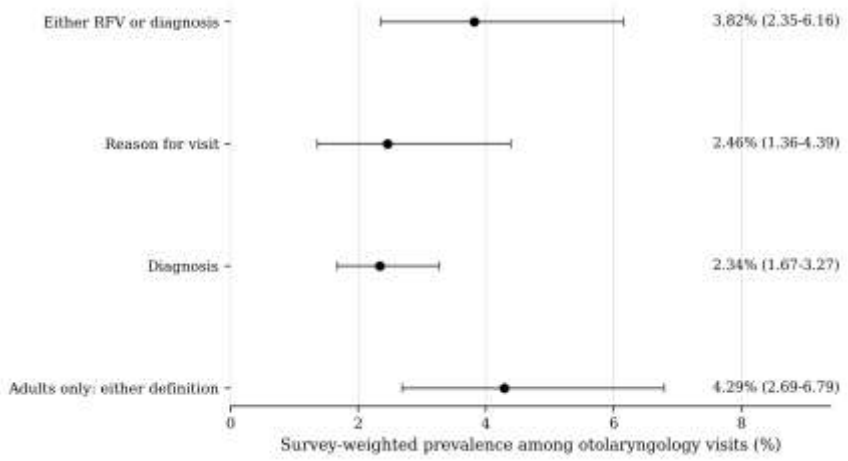

Figure 2. Survey-weighted prevalence of dysphagia-related otolaryngology visits by case definition.

Note. Points are survey-weighted estimates and bars are 95% confidence intervals calculated using the complex survey design. The adults-only estimate uses the primary composite definition. RFV = reason for visit.

Demographic and Encounter Characteristics

Patients represented in dysphagia-related visits were older than those represented in other otolaryngology visits: the weighted mean age was 60.0 years (95% CI, 53.6-66.3) versus 48.0 years (95% CI, 45.1-50.8), a 12-year crude difference ($p < .001$). Visits involving patients aged 65 years or older accounted for 53.5% of dysphagia-related encounters compared with 31.2% of other otolaryngology encounters ($p = .002$). Sex and race/ethnicity distributions did not differ significantly. Medicare represented 56.1% of dysphagia-related visits versus 31.3% of other visits ($p < .001$), while private insurance represented 38.5% versus 55.2%, respectively ($p = .010$). Referral into the sampled visit and presentation for a new problem did not differ significantly (Table 1).

Table 1 Demographic and encounter characteristics of otolaryngology visits by dysphagia status

Characteristic	Dysphagia-related visits, n/N; estimate (95% CI)	Other ENT visits, n/N; estimate (95% CI)	p
Age, years	n=83; 60.0 (53.6-66.3)	n=2,404; 48.0 (45.1-50.8)	<.001
Age ≥65 years	41/83; 53.5% (39.7-66.8)	739/2,404; 31.2% (27.3-35.4)	.002
Male sex	47/83; 49.2% (36.9-61.6)	1,165/2,404; 47.2% (44.2-50.1)	.765
Non-Hispanic White race/ethnicity	71/83; 79.7% (64.3-89.5)	1,933/2,404; 76.4% (68.7-82.6)	.549
Private insurance	33/75; 38.5% (25.8-52.9)	1,242/2,243; 55.2% (48.9-61.4)	.010
Medicare	35/75; 56.1% (41.9-69.3)	675/2,243; 31.3% (26.4-36.6)	<.001
Referred visit	37/71; 50.9% (22.6-78.6)†	1,016/2,096; 56.2% (45.7-66.2)	.721
New problem	37/79; 43.4% (31.2-56.5)	869/2,280; 38.9% (33.8-44.1)	.434

Note. Estimates are survey weighted; counts are unweighted. Means are shown for continuous variables and percentages for categorical variables. † Estimate has fewer than 30 positive records or relative standard error >30% and should be interpreted cautiously. CI = confidence interval; ENT = otolaryngology.

Clinical Characteristics and Resource Measures

Dysphagia-related visits had a higher weighted mean number of recorded chronic conditions than other otolaryngology visits (1.61 vs. 0.96; p < .001). Cancer was documented in 27.7% of dysphagia-related visits compared with 8.1% of other visits (p = .002). Hypertension was also more frequent (38.5% vs. 22.9%; p = .035). However, both the dysphagia-positive cancer and hypertension estimates were supported by fewer than 30 positive sampled records and were therefore flagged for limited statistical reliability. Cerebrovascular disease or stroke history appeared in only one dysphagia-positive visit; Alzheimer disease/dementia, diabetes, obesity, obstructive sleep apnea, upper gastrointestinal endoscopy, and emergency disposition were also too sparse in the dysphagia group for firm interpretation. Physician contact time (22.4 vs. 20.5 minutes; p = .241) and medication count (3.4 vs. 2.9; p = .503) were not significantly different. Referral to another physician was numerically higher among dysphagia visits, but the dysphagia-positive numerator was nine and the estimate was considered unreliable despite a nominal p value of .013 (Table 2; Figure 3).

Table 2 Clinical characteristics, resource measures, and disposition by dysphagia status

Characteristic	Dysphagia-related visits, n/N; estimate (95% CI)	Other ENT visits, n/N; estimate (95% CI)	p
Recorded chronic conditions, count	n=82; 1.6 (1.3-1.9)	n=2,314; 1.0 (0.8-1.1)	<.001
Cancer	17/83; 27.7% (16.7-42.4)†	218/2,404; 8.1% (6.3-10.3)	.002
Cerebrovascular disease / stroke history	1/83; 0.2% (0.0-1.2)†	32/2,404; 0.8% (0.4-1.4)†	.039
Alzheimer disease / dementia	1/83; 0.2% (0.0-1.2)†	9/2,404; 0.5% (0.2-1.5)†	.241
Hypertension	27/83; 38.5% (25.9-52.8)†	559/2,404; 22.9% (19.6-26.5)	.035
Diabetes mellitus	1/83; 1.1% (0.1-7.5)†	94/2,404; 3.6% (2.3-5.6)	.047
Obesity	2/83; 3.5% (1.0-10.8)†	79/2,404; 3.1% (1.8-5.3)	.858
Obstructive sleep apnea	3/83; 3.2% (0.8-11.9)†	118/2,404; 4.5% (3.1-6.5)	.599
Physician contact time, min	n=83; 22.4 (19.1-25.7)	n=2,404; 20.5 (19.1-21.9)	.241
Medications recorded, count	n=83; 3.4 (1.5-5.3)	n=2,404; 2.9 (2.2-3.5)	.503
Upper gastrointestinal endoscopy	4/83; 4.9% (1.5-15.0)†	7/2,404; 0.3% (0.1-0.8)†	.115
Referral to another physician	9/83; 11.4% (6.5-19.3)†	128/2,404; 4.3% (2.9-6.4)	.013
Return as needed / referring clinician	30/83; 30.0% (18.5-44.8)	770/2,404; 35.8% (28.9-43.3)	.362
Emergency referral / hospital admission	0/83; 0.0% (0.0-0.0)†	11/2,404; 0.2% (0.0-0.9)†	.252

Note. Estimates are survey weighted; counts are unweighted. Means are shown for continuous variables and percentages for categorical variables. † Estimate has fewer than 30 positive records or relative standard error >30% and is not used for definitive interpretation. CI = confidence interval; ENT = otolaryngology.

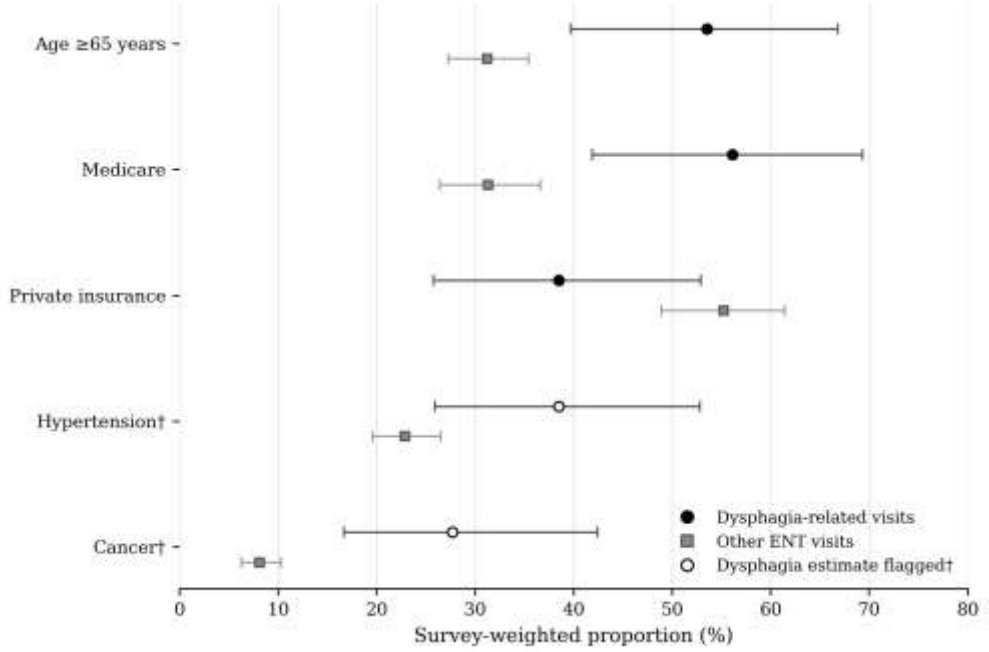

Figure 3. Selected demographic and clinical characteristics by dysphagia status.

Note. Points are survey-weighted proportions and bars are 95% confidence intervals. Hollow circles mark dysphagia estimates with fewer than 30 positive sampled records. † Flagged estimate; ENT = otolaryngology.

Adjusted Associations and Hypothesis Tests

In the survey-weighted logistic regression, cancer showed the strongest independent association with a dysphagia-related visit (adjusted odds ratio [aOR], 3.21; 95% CI, 1.41-7.29; p = .005). Age retained a positive but imprecise association after adjustment (aOR per 10 years, 1.17; 95% CI, 0.99-1.39; p = .067), and male sex was not associated with dysphagia documentation (aOR, 0.99; 95% CI, 0.61-1.62; p = .975) (Table 3; Figure 4). In adjusted linear models, the difference in chronic-condition count was attenuated to 0.18 conditions (95% CI, -0.13 to 0.49; p = .262), and the adjusted difference in physician contact time was 2.21 minutes (95% CI, -1.07 to 5.48; p = .187). Thus, the first hypothesis was supported for older age in crude comparisons and for cancer in both crude and adjusted analyses, whereas the cerebrovascular component could not be tested reliably. The second hypothesis was only partly supported: chronic-condition burden was greater in crude analysis but not after adjustment, and physician contact time was not significantly longer.

Table 3 Survey-weighted adjusted associations with dysphagia-related visits and encounter complexity

Outcome and predictor	Estimate	95% CI	p
Dysphagia-related visit: age, per 10 years	aOR 1.17	0.99-1.39	.067
Dysphagia-related visit: male sex	aOR 0.99	0.61-1.62	.975
Dysphagia-related visit: cancer	aOR 3.21	1.41-7.29	.005
Recorded chronic-condition count: dysphagia visit	Adjusted mean difference 0.18	-0.13 to 0.49	.262
Physician contact time: dysphagia visit	Adjusted mean difference 2.21 min	-1.07 to 5.48	.187

Note. The logistic model included age, sex, and cancer. Linear models of chronic-condition count and physician contact time included dysphagia status, age, sex, and cancer. All models incorporated patient-visit weights, masked strata, and provider clusters. aOR = adjusted odds ratio.

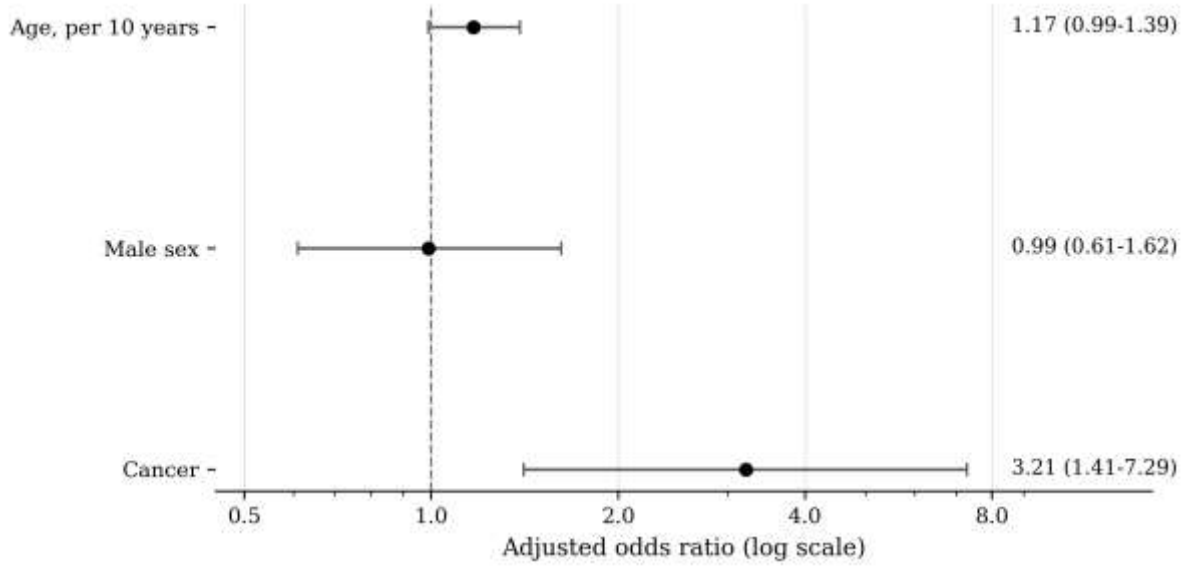

Figure 4. Adjusted associations with a dysphagia-related otolaryngology visit.

Note. Odds ratios are from the survey-weighted logistic model containing age, sex, and cancer. Points indicate adjusted odds ratios; bars indicate 95% confidence intervals; the dashed vertical line indicates the null value of 1.0.

DISCUSSION

Nationally, approximately one in 26 office-based otolaryngology visits in 2015 was for documented dysphagia, with a rate of 3.82% of all visits. This estimate adds to the broader literature documenting that swallowing dysfunction is a significant clinical challenge in ambulatory care and across adult patient populations (Banda et al., 2022; Jones et al., 2018; Rivelsrud et al., 2023). Because the current study focused on otolaryngology office visits documented to include dysphagia, the results should be interpreted as the burden of clinically identified dysphagia in the office-based otolaryngology practice.

The prevalence estimate should be understood in the context of how dysphagia was measured. Based on the 2007-2010 pooled NAMCS data, Mahboubi and Verma (2014) reported that dysphagia was the reason for 1.55% (95% CI, 1.10%-2.0%) of visits to otolaryngologists, while the present analysis yielded a dysphagia reason-for-visit-only estimate of 2.46% (95% CI, 1.36%-4.39%). The composite definition (dysphagia either as a presenting complaint or as a recorded diagnosis) resulted in a higher primary prevalence of 3.82%. This is important because systematic reviews have shown that dysphagia prevalence varies based on ascertainment (Doan et al., 2022; Rajati et al., 2022; Ribeiro et al., 2024).

The current visit-level prevalence estimate is conceptually distinct from prevalence of symptoms in the general population. According to a survey by Bhattacharyya (2014) and Zheng et al. (2023), about 4.0% of adults in the United States reported experiencing a swallowing problem in 2012, and Hong et al. (2024) estimated this figure to be 5.91% in 2022. Using an alternative survey frame and question structure, Adkins et al. (2020) found an even higher prevalence. Although these estimates are based on surveys, they reflect self-reported symptoms in the community, while the current analysis reflects office visits to otolaryngologists for which dysphagia was recorded. This divergence is therefore understandable and consistent with the general methodological evidence that setting and ascertainment have a strong impact on observed prevalence (Adkins et al., 2020; Doan et al., 2022; Hong et al., 2024; Ribeiro et al., 2024).

Unadjusted comparisons showed a strong association between age and dysphagia. Patients in dysphagia-related visits were, on average, 12 years older, with more than half being 65 years or older. This aligns with previous systematic reviews that found that dysphagia burden was greater in older adults and that physiologic vulnerability interacts with multimorbidity and disease burden (Doan et al., 2022; Madhavan et al., 2016; Rivelsrud et al., 2023). The lack of conventional statistical significance of age in the adjusted model may be due to limited power and the overlap in the small dysphagia-positive subgroup between age and cancer prevalence.

Cancer showed the strongest independent association with a dysphagia-related visit. The proportion of visits in which a cancer diagnosis was documented was more than three times as high in dysphagia-related visits as in other otolaryngology visits, and the adjusted odds of dysphagia remained elevated when age and sex were considered. This finding aligns with the clinical understanding of the high prevalence of swallowing dysfunction in head and neck cancer and the fact that dysphagia is a central issue in the care of patients with head and neck cancer (Kuhn et al., 2023; McCarty & Chao, 2021; Schindler et al., 2022). However, the NAMCS cancer variable is broad and does not specify tumor location, stage of diagnosis, surgical procedure, radiation therapy or chemoradiation; thus, the current analysis does not allow identification of which oncologic pathway was responsible for the association.

Caution should be used in interpreting the cerebrovascular result. The estimate was statistically unstable because only one dysphagia-positive otolaryngology visit had an indicator for cerebrovascular disease or stroke history. This does not refute the established association between stroke and dysphagia reported in previous studies, but the number of positive records in the otolaryngology sample was too small to reliably assess the association (Martino et al., 2005; Rajati et al., 2022). The low frequency of neurologic coding in the outpatient specialty visits may also reflect the small number of chronic-condition fields and the fact that many neurologic conditions do not fall under the auspices of otolaryngology.

The second hypothesis was partially supported. The crude number of chronic conditions was higher in dysphagia-related visits, consistent with the notion that swallowing problems often coexist with multimorbidity, frailty, and complex medical needs (Baijens et al., 2016; Doan et al., 2022; Rivelsrud et al., 2023). The adjusted mean difference, however, was reduced and not significant after adjustment for age, sex, and cancer. Similarly, there was a trend towards increased physician contact time but no significant difference. In descriptive analyses, patterns indicate that visits for dysphagia might be more complex; however, the number of observations was too small to distinguish dysphagia from other correlated clinical factors.

The payment distribution was similar to the age distribution, with Medicare having a higher percentage of visits for dysphagia and private insurance having a lower percentage of visits for dysphagia. Previous U.S. studies have shown that dysphagia prevalence and treatment are related to socioeconomic and access factors (Adkins et al., 2020; Zheng et al., 2023). However, the present analysis did not include payer in the parsimonious adjusted model and payer is closely tied to age, so these differences should be viewed as descriptive rather than as necessarily representing an independent access effect. In a similar fashion, although a numerically higher proportion of visits involved a referral to another physician, only nine dysphagia-positive sampled records substantiated this estimate. Therefore, nominal statistical significance should not be interpreted as evidence of a stable association, because it was based on sparse cells.

The clinical results suggest that dysphagia is not a rare but rather a frequent problem in office-based otolaryngology. A high prevalence (close to 1 out of every 26 visits) plus the higher age distribution and cancer association provides a rationale for maintaining the focus on swallowing symptoms during specialty assessment, especially when structural disease or history of treatment is pertinent (Kuhn et al., 2023; McCarty & Chao, 2021; Schindler et al., 2022). The data are not sufficient for a universal screening recommendation or a causal risk score due to the following reasons: documentation-based outcome, cross-sectional design, and absence of many important diagnostic details. Rather, the contribution is epidemiologic: the study reveals where the most frequent documentation of dysphagia was found and the uncertainty around the estimates, based on the survey design.

There are a number of strengths in the study. NAMCS offers a national probability framework with a common denominator of U.S. office-based otolaryngology visits, and the analysis included weights, strata, and provider clusters to account for the sampled visits, which were not a simple random sample. Dysphagia was determined based on the reason-for-visit and diagnosis fields, with sensitivity analyses of component definitions and an adult-only population. Unweighted counts were reported with weighted estimates, and estimates with high relative standard errors or sparse counts were explicitly labelled instead of being over-interpreted. These features enhance transparency and help ensure that the statistical analysis is in line with the study objectives.

There are a number of limitations associated with making inferences. First, NAMCS samples visits rather than unique patients; thus, 3.82% is a visit-level prevalence and provides no indication of the percentage of otolaryngology patients who have dysphagia. Second, the outcome is identified only through routine documentation and does not directly provide information on the swallowing phase, the severity of the symptoms, aspiration, results of videofluoroscopy or endoscopy, or validated patient-reported measures. The lack of reporting of dysphagia when it was not one of the possible reasons or

diagnoses may have led to an underestimation of its prevalence. Third, only 83 sampled visits met the primary definition, which restricted the subgroup and multivariable analyses and resulted in unstable estimates for neurologic disorders and procedures as well as for several comorbidities. Fourth, the broad cancer indicator provides no anatomic or treatment details. Fifth, the data for 2015 might not capture current referral or coding practices, telehealth, or multidisciplinary practices. Finally, because of the cross-sectional design, only contemporaneous associations can be identified and causal effects and temporal sequence cannot be determined. Future research should incorporate larger neurologic subgroups, validated measures of swallowing, patient-level follow-up, cancer-site, and treatment data with more current specialty data.

CONCLUSION

Nationally representative data on the prevalence of documented dysphagia in visits to otolaryngology offices in the United States in 2015 indicate that one in 26 visits (3.82%) involved documented dysphagia. Dysphagia-related encounters involved older patients, greater crude chronic-condition burden, and substantially more recorded cancer than other otolaryngology encounters. The results indicated that cancer remained significant, while after adjustment for age and sex, age became statistically imprecise and differences in chronic-condition count and physician contact time were attenuated. The cerebrovascular component could not be assessed reliably because only one dysphagia-positive visit had the relevant indicator. These results help to describe the ambulatory otolaryngology burden of documented dysphagia and identify important clinical features but do not suggest any cause-and-effect relationship. Interpretation should be at the visit level and take into consideration sparse cells, the routine coding in the dataset, and the age of the dataset. Future patient-level research is required to further refine risk stratification and treatment pathways based on patient-specific data with validated swallowing assessment, treatment details, and larger neurologic samples.

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