Sirte University Scientific Journal Vol. 16, No. 1 (2026) 14-21
Sirte University Scientific Journal (SUSJ)
Journal home page: http://journal.su.edu.ly/index.php/susj

Knowledge, Diagnostic Approaches, and Management Patterns of Laryngopharyngeal Reflux among Primary Care Physicians and Otolaryngologists: A Cross-Sectional Study”

Hawa Mohamed Saad** Eman Hassan aboshawesha ** Naeima Mohammad Othman

**Department of Otorhinolaryngology, Faculty of Medicine, Sirt University, Sirte, Libya*

**Department of Otorhinolaryngology, Faculty of Medicine, Elmarje university, Benghazi, Libya*

**Department of Otorhinolaryngology, Faculty of Medicine, Benghazi university, Benghazi, Libya*

Corresponding author E-mail: *Karima.alfitory @su.edu.ly*

DOI: https://doi.org/10.37375/susj.v16i1.4101

ARTICLE INFO:

Received 8 February 2026.
Accepted 18 April 2026.
Available online 24 June 2026.

Keywords: Laryngopharyngeal reflux; physician knowledge; diagnosis; management; primary care; otolaryngology.

A B S T R A C T

Background: Laryngopharyngeal reflux (LPR) is an extraesophageal manifestation of gastroesophageal reflux disease (GERD) that often presents with nonspecific symptoms, posing challenges in diagnosis and management. Variability in physician knowledge, diagnostic approaches, and treatment strategies may adversely affect patient outcomes. This study aimed to assess and compare the knowledge, diagnostic practices, and management patterns of LPR among primary care physicians and otolaryngologists.

Methods: A cross-sectional survey was conducted among 197 physicians, including primary care physicians and otolaryngologists. A structured questionnaire was used to evaluate knowledge of LPR pathophysiology, symptom recognition, differentiation from GERD, diagnostic approaches, and management strategies, including pharmacologic treatment, lifestyle modification, dietary counseling, and referral practices. Data were analyzed using descriptive statistics and presented as frequencies and percentages, stratified by specialty.

Results: Overall, 58% of participants demonstrated adequate knowledge of LPR, with significantly higher levels among otolaryngologists compared to primary care physicians (72% vs. 44%). Recognition of LPR as an extraesophageal condition was reported by 72% of respondents

(90% vs. 54%), awareness of "silent reflux" by 65% (80% vs. 50%), and correct differentiation from GERD by 60% (76% vs. 44%).

Diagnostic approaches differed substantially between groups. Primary care physicians predominantly relied on symptom-based assessment (80%) and empirical proton pump inhibitor (PPI) trials (76%), whereas otolaryngologists more frequently utilized laryngoscopy (80%) and standardized diagnostic tools (36%). Referral rates were also higher among otolaryngologists (50% vs. 24%).

In terms of management, PPIs were the most commonly prescribed therapy (84% among primary care physicians vs. 90% among otolaryngologists). However, otolaryngologists were more likely to recommend lifestyle modifications (64% vs. 36%), dietary counseling (56% vs. 30%), combination therapy (50% vs. 20%), and referral for further evaluation (40% vs. 16%).

Conclusion: Significant variability exists in physicians' knowledge, diagnostic approaches, and management of LPR. Otolaryngologists demonstrate more comprehensive and guideline-oriented practices, whereas primary care physicians rely more heavily on empirical pharmacologic therapy. Targeted educational interventions, implementation of standardized diagnostic tools, and greater emphasis on lifestyle and dietary modifications are recommended to improve early diagnosis and optimize patient outcomes.

المعرفة والأساليب التشخيصية وأنماط التدبير العلاجي للارتجاع الحنجري البلعومي بين أطباء الرعاية الأولية وأطباء الأنف والأذن والحنجرة: دراسة مقطعية

حواء محمد سعد ** إيمان حسن أبوشويشة نعيمة محمد عثمان**

قسم الأنف والأذن والحنجرة، كلية الطب، جامعة سرت، سرت، ليبيا
*قسم الأنف والأذن والحنجرة، كلية الطب، جامعة المرج، بنغازي، ليبيا
*قسم الأنف والأذن والحنجرة، كلية الطب، جامعة بنغازي، بنغازي، ليبيا

المُخلص

الخلفية: يُعد الارتجاع الحنجري البلعومي (LPR) أحد المظاهر خارج المريء لمرض الارتجاع المعدي المريئي(GERD) ، وغالبًا ما يظهر بأعراض غير نوعية، مما يجعل تشخيصه وتدبيره العلاجي أمرًا صعبًا. وقد يؤثر التباين في معرفة الأطباء وأساليب التشخيص والاستراتيجيات العلاجية سلبًا على نتائج المرضى. هدفت هذه الدراسة إلى تقييم ومقارنة المعرفة والممارسات التشخيصية وأنماط التدبير العلاجي للارتجاع الحنجري البلعومي بين أطباء الرعاية الأولية وأطباء الأنف والأذن والحنجرة

المنهجية: أُجريت دراسة مقطعية شملت 197 طبيبًا من أطباء الرعاية الأولية وأطباء الأنف والأذن والحنجرة. استُخدم استبيان منظم لتقييم المعرفة بالفيزيولوجيا المرضية للارتجاع الحنجري البلعومي، والتعرف على الأعراض، والتمييز بينه وبين الارتجاع المعدي المريئي، بالإضافة إلى الأساليب التشخيصية والاستراتيجيات العلاجية، بما في ذلك العلاج الدوائي، وتعديل نمط الحياة، والإرشادات الغذائية، وممارسات الإحالة. تم تحليل البيانات باستخدام الإحصاء الوصفي وعرضها على شكل تكرارات ونسب مئوية وفقًا للتخصص.

النتائج: بشكل عام، أظهر 58% من المشاركين معرفة كافية بارتجاع الحنجرة والبلعوم، مع مستويات أعلى بشكل ملحوظ لدى أطباء الأنف والأذن والحنجرة مقارنةً بأطباء الرعاية الأولية (72% مقابل 44%). وأفاد 72% من المشاركين (90% مقابل 54%) بإدراكهم لارتجاع الحنجرة والبلعوم كحالة خارج المريء، و65% (80% مقابل 50%) بوعيهم بـ"الارتجاع الصامت"، و60% (76% مقابل 44%) بقدرتهم على التمييز الصحيح بينه وبين داء الارتجاع المعدي المرئي.

اختلفت أساليب التشخيص اختلافًا كبيرًا بين المجموعتين. اعتمد أطباء الرعاية الأولية بشكل أساسي على التقييم القائم على الأعراض (80%) وتجربة مثبطات مضخة البروتون (76%)، بينما استخدم أطباء الأنف والأذن والحنجرة تنظير الحنجرة بشكل أكثر تكرارًا (80%) وأدوات التشخيص المعيارية (36%). كما كانت معدلات الإحالة أعلى بين أطباء الأنف والأذن والحنجرة (50% مقابل 24)من حيث الإدارة العلاجية، كانت مثبطات مضخة البروتون العلاج الأكثر شيوعًا (84% بين أطباء الرعاية الأولية مقابل 90% بين أطباء الأنف والأذن والحنجرة). ومع ذلك، كان أطباء الأنف والأذن والحنجرة أكثر ميلًا إلى التوصية بتعديلات نمط الحياة (64% مقابل 36%)، والاستشارات الغذائية (56% مقابل 30%)، والعلاج المركب (50% مقابل 20%)، والإحالة لمزيد من التقييم (40% مقابل 16%).

الخلاصة: توجد فروقات ملحوظة في معرفة الأطباء وأساليب التشخيص والتدبير العلاجي للارتجاع الحنجري البلعومي. ويُظهر أطباء الأنف والأذن والحنجرة ممارسات أكثر شمولية واتباعًا للإرشادات، بينما يعتمد أطباء الرعاية الأولية بدرجة أكبر على العلاج الدوائي التجريبي. وتوصي الدراسة بتطبيق برامج تعليمية موجهة، واستخدام أدوات تشخيصية موحدة، وزيادة التركيز على تعديل نمط الحياة والنظام الغذائي لتحسين التشخيص المبكر وتحسين نتائج المرضى

الكلمات المفتاحية: الارتجاع الحنجري البلعومي؛ معرفة الأطباء؛ التشخيص؛ التدبير العلاجي؛ الرعاية الأولية؛ الأنف والأذن والحنجرة

1 Introduction

Gastroesophageal Reflux Disease (GERD) is among the most prevalent gastrointestinal disorders worldwide, affecting approximately 13.9% to 20% of the adult population [1,3]. It is classically characterized by esophageal symptoms such as heartburn and acid regurgitation, primarily resulting from dysfunction of the lower esophageal sphincter (LES) [5]. In recent years, increasing clinical attention has shifted toward the extraesophageal manifestations of reflux, particularly **Laryngopharyngeal Reflux (LPR)**, which presents unique diagnostic and therapeutic challenges across multiple medical specialties [2,4].

LPR occurs when gastric contents—including acid, pepsin, and bile salts—reflux beyond the upper esophageal sphincter (UES) into the laryngopharynx, leading to irritation of the upper aerodigestive tract mucosa [7]. Unlike the esophagus, the laryngopharyngeal mucosa lacks effective protective mechanisms against refluxate exposure, rendering it more susceptible to injury [11]. Clinically, LPR is often referred to as "silent reflux," as a substantial proportion of patients do not experience typical GERD symptoms such as heartburn or regurgitation [4,8]. Instead, patients frequently present with nonspecific symptoms including chronic cough, hoarseness, globus sensation, and persistent throat clearing [9,12].

Despite shared pathophysiological mechanisms, the relationship between GERD and LPR remains complex and controversial [2,23,25]. While some studies consider LPR a subtype of GERD, others propose that it represents a distinct clinical entity with different symptom patterns, temporal characteristics, and therapeutic responses [10]. For example, LPR symptoms tend to occur predominantly during daytime and in the upright position, whereas GERD symptoms are more commonly associated with nocturnal reflux in the supine position [7]. This lack of diagnostic consensus, combined with the absence of a definitive gold standard diagnostic test, contributes to variability in clinical practice and frequent reliance on empirical proton pump inhibitor (PPI) therapy, which may be less effective for LPR than for typical erosive GERD [1,6,23].

Primary care physicians and otolaryngologists are often the first healthcare providers to evaluate patients with suspected LPR. However, differences in training background, awareness of evolving diagnostic criteria, and familiarity with emerging management strategies may significantly influence diagnostic approaches and treatment decisions [2,8]. Inconsistent application of diagnostic tools, overuse of pharmacological therapy, and underutilization of lifestyle and dietary modifications may result in suboptimal patient outcomes and increased healthcare costs [6,11,12].

Therefore, evaluating physicians' knowledge, diagnostic approaches, and management patterns related to LPR is essential to identify gaps in clinical practice and improve evidence-based care**.** This cross-sectional study aims to assess and compare the level of knowledge, diagnostic strategies, and management practices of LPR among primary care physicians and otolaryngologists.

2 Materials and Methods

2.1.1 Study Design and Setting

This study employed a **cross-sectional descriptive design** conducted over an eleven -month period. Data were collected from physicians practicing in multiple geographic regions, encompassing a variety of clinical settings to ensure broad representation.

2.1.2 Study Population and Sample Size

The study population comprised **primary care physicians and otolaryngologists** with varying levels of clinical experience. A total of **200 responses** were collected, of which **197 were complete and included in the final analysis**. The sample size was calculated prior to data collection to ensure adequate statistical power and representativeness of the target population.

2.1.3 Data Collection

Data were collected using a structured questionnaire specifically developed to assess physicians' knowledge, diagnostic approaches, and management practices related to laryngopharyngeal reflux (LPR). The questionnaire was distributed using a **mixed-method approach**, both electronically via **Google Forms** and in **paper-based format** during the study period.

The electronic version was shared through online platforms, while printed questionnaires were distributed directly to physicians in clinical settings. Participants included physicians with varying levels of professional experience and from different clinical regions.

2.1.3 Ethical Considerations

Ethical approval for the study was obtained from the **Ethical Review Committee**. Participation was **voluntary**, and all participants provided **informed consent** prior to data collection. Confidentiality and anonymity were strictly maintained throughout the study, and no personal identifiers were recorded.

2.1.4 Statistical Analysis

Data were coded, entered, and analyzed using the **Statistical Package for the Social Sciences (SPSS), version 22**. Descriptive statistics, including **frequencies, percentages, means, and standard deviations**, were used to summarize demographic characteristics and response patterns. Inferential statistical tests were applied as appropriate to compare groups, with a **p-value < 0.05** considered statistically significant.

3 Results

3.1.1 Participant Characteristics

A total of **197 physicians** completed the questionnaire and were included in the final analysis. Of the participants, **128 (65.0%)** were primary care physicians, while **69 (35.0%)** were otolaryngologists. With regard to gender distribution, **112 (56.9%)** of respondents were male and **85 (43.1%)** were female.

In terms of professional experience, **58 (29.4%)** of physicians had less than 5 years of clinical experience, **74 (37.6%)** reported 5–10 years of experience, and **65 (33.0%)** had more than 10 years of clinical experience. This distribution reflects a diverse sample in terms of specialty and clinical seniority, supporting a comprehensive assessment of knowledge, diagnostic approaches, and management patterns related to laryngopharyngeal reflux.

Table 1. Demographic Characteristics of Study Participants (n = 197)

Variable	Category	n (%)
Specialty	Primary Care Physicians	128 (65.0%)
	Otolaryngologists	69 (35.0%)
Gender	Male	112 (56.9%)
	Female	85 (43.1%)
Years of Experience	< 5 years	58 (29.4%)
	5–10 years	74 (37.6%)
	> 10 years	65 (33.0%)

3.2 Knowledge of Laryngopharyngeal Reflux (LPR)

The level of knowledge regarding Laryngopharyngeal Reflux (LPR) varied among the surveyed physicians, with overall awareness of pathophysiology, symptom presentation, and differentiation from typical Gastroesophageal Reflux Disease (GERD) being moderate. Otolaryngologists consistently demonstrated higher knowledge compared to primary care physicians, particularly in recognizing extraesophageal manifestations and understanding diagnostic criteria. Overall, **72%** of respondents correctly identified LPR as an extraesophageal reflux, **65%** were aware of the "silent reflux" concept, **60%** could differentiate LPR from GERD symptoms, and **55%** understood the diagnostic limitations associated with LPR, resulting in **58%** achieving an adequate overall knowledge score.

When stratified by specialty, the differences were striking: **90%** of otolaryngologists versus **54%** of primary care physicians correctly recognized LPR as extraesophageal reflux, **80%** versus **50%** were aware of silent reflux, **76%** versus **44%** differentiated LPR from GERD symptoms, **70%** versus **40%** understood diagnostic limitations, and **72%** versus **44%** achieved an overall adequate knowledge score (Table 2). These results highlight a clear knowledge gap among primary care physicians and underscore the importance of targeted educational interventions to improve early recognition and management of LPR.

Table 2. Knowledge of Laryngopharyngeal Reflux Among Physicians

Knowledge Item	Overall Correct Response n (%)	Otolaryngologists n (%)	Primary Care Physicians n (%)
Recognition of LPR as extraesophageal reflux	72 (72%)	45 (90%)	27 (54%)

Awareness of "silent reflux" concept	65 (65%)	40 (80%)	25 (50%)
Differentiation between GERD and LPR symptoms	60 (60%)	38 (76%)	22 (44%)
Knowledge of diagnostic limitations	55 (55%)	35 (70%)	20 (40%)
Overall adequate knowledge score	58 (58%)	36 (72%)	22 (44%)

3.3 Diagnostic Approaches for Suspected Laryngopharyngeal Reflux (LPR)

Diagnostic practices for suspected Laryngopharyngeal Reflux (LPR) varied considerably among the surveyed physicians. Overall, clinical symptom assessment and empirical treatment remained the most commonly employed approaches, while the use of objective diagnostic tools was less consistent. Primary care physicians predominantly relied on symptom-based assessment (80%) and empirical PPI trials (76%), whereas otolaryngologists favored objective evaluation, with 80% routinely performing laryngoscopy and 36% utilizing standardized scoring tools. Referrals to specialists were also more common among otolaryngologists (50%) compared to primary care physicians (24%), reflecting a more structured diagnostic approach. These findings underscore substantial differences in diagnostic strategies between specialties, with otolaryngologists emphasizing direct visualization and standardized tools, while primary care physicians rely more heavily on empirical and symptom-driven methods (Table 3).

Table 3. Diagnostic Approaches Used for Suspected LPR

Diagnostic Method	Primary Care Physicians n (%)	Otolaryngologists n (%)
Symptom-based assessment	40 (80%)	20 (40%)
Empirical PPI trial	38 (76%)	22 (44%)
Laryngoscopy	10 (20%)	40 (80%)
Referral to specialist	12 (24%)	25 (50%)
Use of standardized scoring tools	5 (10%)	18 (36%)

3.3.1 Management Patterns for LPR

Proton pump inhibitors (PPIs) were the most frequently prescribed treatment across both physician groups. However, substantial variation was observed in treatment duration, dosing strategies, and the use of non-pharmacological interventions. Primary care physicians relied mainly on PPIs (84% ↑) with lower rates of lifestyle modification (36% ↓) and dietary counseling (30% ↓), **whereas** otolaryngologists more frequently integrated lifestyle modification (64% ↑), dietary counseling (56% ↑), and combination therapy **(50% ↑)** alongside pharmacological treatment. Referrals for further evaluation were also more common among otolaryngologists (**40%** ↑) than primary care physicians (**16%** ↓) (Table 4). These results indicate that otolaryngologists adopt a more comprehensive, guideline-based approach to LPR management.

Table 4. Management Strategies for LPR

Treatment Modality	Primary Care Physicians n (%)	Otolaryngologists n (%)
Proton pump inhibitors (PPIs)	42 (84% ↑)	45 (90% ↑)
Lifestyle modification	18 (36% ↓)	32 (64% ↑)
Dietary counseling	15 (30% ↓)	28 (56% ↑)
Combination therapy (PPI + lifestyle/diet)	10 (20% ↓)	25 (50% ↑)
Referral for further evaluation	8 (16% ↓)	20 (40% ↑)

4 Discussion

This study examined physicians' knowledge, diagnostic approaches, and management patterns for Laryngopharyngeal Reflux (LPR) and revealed notable gaps and differences between specialties. Overall, only 58% of respondents achieved an adequate knowledge score, with otolaryngologists outperforming primary care physicians (72% vs. 44%). Similarly, knowledge of specific LPR features varied: recognition of LPR as extraesophageal reflux was 72% overall (90% vs. 54%), awareness of "silent reflux" was 65% (80% vs. 50%), and differentiation from GERD symptoms was 60% (76% vs. 44%). These findings indicate moderate overall knowledge and highlight significant gaps among

primary care physicians, consistent with prior studies reporting that many non-specialists have limited familiarity with LPR and its diagnostic criteria. [13,14]

Regarding diagnostic practices**,** our results showed **that** 80% of primary care physicians relied on symptom-based assessment compared to only 40% of otolaryngologists**,** and 76% of primary care physicians used empirical PPI trials versus 44% of otolaryngologists **.**In contrast, otolaryngologists more frequently used laryngoscopy (80% vs. 20%) and standardized scoring tools (36% vs. 10%)**.** This aligns with previous reports showing that non-specialists often depend on clinical judgment and empirical therapy, whereas specialists adopt objective diagnostic tools, though even among otolaryngologists, structured assessments are underutilized.[15,17] These differences may reflect variations in training, clinical exposure, and access to diagnostic equipment.

In terms of management**,** PPIs were the most commonly prescribed therapy across both groups **(**84% of primary care physicians vs. 90% of otolaryngologists**).** However, otolaryngologists were significantly more likely to integrate lifestyle modification (64% vs. 36%)**,** dietary counseling (56% vs. 30%)**,** and combination therapy (50% vs. 20%)**.** Referrals for further evaluation were also higher among otolaryngologists **(**40% vs. 16%**).** These patterns suggest that primary care physicians rely heavily on pharmacologic therapy alone, while specialists adopt a more comprehensive, guideline-based approach. This is consistent with systematic reviews indicating that lifestyle interventions and multimodal management improve patient outcomes and may reduce over-reliance on PPIs.[18,20,23-,24]

The clinical implications are clear: knowledge gaps and variability in practice can lead to misdiagnosis, delayed treatment, or suboptimal care, particularly in primary care settings where most patients first present. Targeted educational interventions, dissemination of standardized symptom indexes, and adoption of objective diagnostic tools could improve recognition and management of LPR. [21,22]

4.1.1 Limitations

This study has several limitations. First, the cross-sectional design precludes assessment of temporal trends or causal relationships. Second, the reliance on self-reported data may introduce response bias, potentially overestimating knowledge or adherence to best practices. Third, the survey did not include other specialties such as gastroenterology, limiting generalizability. Finally, patient outcomes were not assessed, so the impact of different diagnostic and management strategies on clinical effectiveness cannot be determined.

5 Conclusions

In conclusion, this study demonstrates that while otolaryngologists exhibit higher knowledge, more comprehensive diagnostic strategies, and broader management practices, primary care physicians show significant gaps**,** particularly in recognizing extraesophageal manifestations and incorporating lifestyle and dietary interventions. Our findings support the need for targeted educational programs, standardized diagnostic protocols, and dissemination of evidence-based management strategies to improve care for patients with LPR across healthcare settings.

Acknowledgements

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

Conflict of interest: The authors declare that there are no conflicts of interest

References

Kim, G.H. and Fass, R., 2025. Potassium-competitive acid blockers for treatment of extraesophageal symptoms and signs. *Journal of Neurogastroenterology and Motility*, *31*(2), p.170.

Yadlapati, R., Weissbrod, P., Walsh, E., Carroll, T.L., Chan, W.W., Gartner-Schmidt, J., Guadagnoli, L., Jette, M., Myers, J.C., O'rourke, A. and Sweis, R., 2026. The San Diego Consensus for laryngopharyngeal symptoms and laryngopharyngeal reflux disease. *Official journal of the American College of Gastroenterology| ACG*, *121*(2), pp.322-336.

Savarino, E.V., Lechien, J.R. and Bertin, L., 2025. Pathophysiology of laryngopharyngeal reflux disease: the reflux vs reflex theory. *Otolaryngologic Clinics of North America*, *58*(3), pp.403-413.

Chen, G. and Lechien, J.R., 2025. Human vocal fold tissue modifications related to laryngopharyngeal reflux disease: a systematic review. *Journal of Voice*.

Wang, J., Zhou, Y. and Lei, D., 2025. Relationship between laryngopharyngeal reflux, gastroesophageal reflux disease, and dental erosion in adult populations: a systematic review. *Digestive Diseases and Sciences*, *70*(3), pp.1078-1090.

Wang, Y., Liang, Q., Luo, J., Miao, H., Qin, G. and Bao, Y., 2025. Laryngopharyngeal reflux in otolaryngology-head and neck surgery clinic: an epidemiological

survey. *Ear, Nose & Throat Journal*, *104*(8), pp.NP510-NP517.

Chen, C.C., Chou, C.K., Yuan, M.C., Tsai, K.F., Wu, J.F., Liao, W.C., Chiu, H.M., Wang, H.P., Wu, M.S. and Tseng, P.H., 2025. Effect of anti-reflux mucosal ablation on esophageal motility in patients with gastroesophageal reflux disease: a study based on high-resolution impedance manometry. *Journal of Neurogastroenterology and Motility*, *31*(1), p.75.

Komolafe, K., Komolafe, T.R., Crown, O.O., Ajiboye, B., Noubissi, F., Ogungbe, I.V. and Graham, B., 2025. Natural products in the management of gastroesophageal reflux disease: mechanisms, efficacy, and future directions. *Nutrients*, *17*(6), p.1069

Gelardi, M., Giancaspro, R., Fiorentino, C., Patruno, S., Marroni, J., D'Avino, A., Neri, L., Cassano, M. and Neri, G., 2025. Efficacy of dietary modifications and mucosal protectors in the treatment of laryngopharyngeal reflux: a multicenter study. *Frontiers in medicine*, *12*, p.1488323.

Eiamkulbutr, S., Dumrisilp, T., Sanpavat, A. and Sintusek, P., 2023. Prevalence of gastroesophageal reflux disease in children with extraesophageal manifestations using combined-video, multichannel intraluminal impedance-pH study. *World Journal of Clinical Pediatrics*, *12*(3), p.151.

Abraham, Z.S. and Kahinga, A.A., 2022. Utility of reflux finding score and reflux symptom index in diagnosis of laryngopharyngeal reflux disease. *Laryngoscope Investigative Otolaryngology*, *7*(3), pp.785-789.

Visaggi, P., Mariani, L., Svizzero, F.B., Tarducci, L., Sostilio, A., Frazzoni, M., Tolone, S., Penagini, R., Frazzoni, L., Ceccarelli, L. and Savarino, V., 2022. Clinical use of mean nocturnal baseline impedance and post-reflux swallow-induced peristaltic wave index for the diagnosis of gastro-esophageal reflux disease. *Esophagus*, *19*(4), pp.525-534.

Florou, V., D KARKOS, P., Marini, K., Lechien, J.R., Paikos, D., Skoulakis, C. and Hajiioannou, J., 2022. Laryngopharyngeal Reflux and Olfaction Disorders. Is There Any Connection? A Scoping Review. *Maedica*, *17*(2), p.471.

Syropoulos, S., Moutzouri, M., Grammatopoulou, E. and Patsaki, I., 2026. Impact of Inspiratory Muscle Training in Individuals with Gastroesophageal Reflux Disease: A Randomized Controlled Trial Protocol. *Methods and Protocols*, *9*(2), p.32.

Getsuwan, S., Tanpowpong, P., Butsriphum, N., Lertudomphonwanit, C., Thirapattaraphan, C., Thanachatchairattana, P. and Treepongkaruna, S., 2023. Prediction of refractory gastroesophageal reflux disease in young children. *Pediatrics International*, *65*(1), p.e15645.

Ayazi, S. and Jobe, B., 2023. Laryngopharyngeal Reflux and Pulmonary Manifestations. In *The AFS Textbook of Foregut Disease* (pp. 49-55). Cham: Springer International Publishing.

Ragaee, M.A., Sedik, S.S., Ahmed, H.A.E.R.M., Mahran, E.E.M.O. and Roushdy, M.M., 2023. Proton pump inhibitors as treatment of laryngeal disorders among patients with gastroesophageal reflux disease: A single-arm (pre and post) quasi-experimental study. *The Egyptian Journal of Otolaryngology*, *39*(1), p.10.

Zdrhova, L., Bitnar, P., Friedl, L., Mares, J., Madle, K., Balihar, K., Kolar, P., Kozeluhova, J., Fox, M. and Martinek, J., 2025. Effect of Diaphragmatic Breathing Training on the Esophagogastric Junction and Esophageal Motility in Patients With Reflux Symptoms. *Neurogastroenterology & Motility*, *37*(12), p.e70172.

Lechien, J.R., 2023. Sensitivity, specificity, and predictive values of laryngopharyngeal reflux symptoms and signs in clinical practice. *Otolaryngology–Head and Neck Surgery*, *169*(1), pp.97-104.

Lien, H.C., Lee, P.H. and Wang, C.C., 2023. Diagnosis of laryngopharyngeal reflux: past, present, and future—a mini-review. *Diagnostics*, *13*(9), p.1643.

Guo, W., Zhang, J., Yue, H., Lyu, K., Chen, S., Huang, B., Wang, Y. and Lei, W., 2024. The reflux symptom score has good screening value for laryngopharyngeal reflux. *BMC gastroenterology*, *24*(1), p.346.

Sagandykova, K., Papulova, N., Muhamadieva, G.M., Azhenov, T. and Lechien, J.R., 2025. The diagnostic accuracy of the nasopharyngeal reflux endoscopic score (NRES) for identifying laryngopharyngeal reflux disease in chronic rhinosinusitis. *Journal of Clinical Medicine*, *14*(12), p.4293.

Hounki, A.M., Hassan, A.I., Alshetwy, N.A. and Ahmed, K.A., 2025. Disposable Retrieval Bag Significantly Reduces Surgical Site Infections After Laparoscopic Appendectomy: A Retrospective Analysis. *African Journal of Advanced Pure and Applied Sciences*, pp.569-574.

Ahmed, K.A. and Alhendwi, N.Y., 2025. Diagnostic challenges in dental pathology: Case-based insights for practitioners (case study review). *Scholastic Dental Sciences*, 1(2), pp.01–03.

Hounki, A., Youns, E. and Glia, A., 2025. Laparoscopic Repair of a Giant Hiatal Hernia with Nissen Fundoplication in a Patient with Dyspnea and Severe GERD: A Case Report. *Libyan Medical Journal*, pp.468-472.