

论著·循证医学

## 口腔癌术后言语功能的评估工具:一项范围综述

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**[摘要]** **目的**·对口腔癌术后言语功能的评估工具做范围审查,以获得现有研究中存在的口腔癌术后言语功能的评估工具,总结口腔癌术后言语功能评估工具的应用方法、应用场景及发展现况。**方法**·采用澳大利亚 JBI (Joanna Briggs Institute) 循证卫生保健中心范围综述的方法为方法学框架,检索库包括 PubMed、Web of Science、Embase、CINAHL、CNKI、万方、维普,英文检索词为 ("oral cancer" or "oral cavity cancer" or "head and neck neoplasm\*" [MeSH Terms]) AND ("speech" or "language" [MeSH Terms]) AND ("assess\*" or "evaluat\*" [MeSH Terms]), 中文检索关键词为“言语”“言语障碍”“言语功能”,检索学科限定为“口腔医学”或“护理学”。检索时限为建库至2022年7月,对纳入文献进行汇总分析。**结果**·从文献库中初步检索后得到4 476篇文章,剔除重复文献、与研究目的及内容无关文献、综述类文献、非中文或非英文文献等,最终纳入9篇文献,包含7篇横断面研究和2篇队列研究,纳入文献的时间范围为1990—2022年,国家来源包含美国、日本、德国、印度等,共归纳出3种评估方式,分别为量表、自动化识别技术和物联网设备其他方式,其中量表评估为目前最主流的评估方式,言语障碍指数 (speech handicap index, SHI) 为应用最广泛的评估量表之一,在我国已得到文化调适及汉化,但本土原创的评估工具未检索到。**结论**·口腔癌术后言语评估工具中,量表为应用最广泛的方式,但同时兼顾主观和客观的言语评估工具较少,目前国内相关研究处于空缺。未来可结合这两方面开展相关研究,研发适用于本土语言的口腔癌术后言语功能评估工具。

**[关键词]** 言语障碍; 口腔癌; 评估工具; 术后; 范围综述

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## Evaluation tools for speech function after oral cancer surgery: a scoping review

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**[Abstract]** **Objective**·To obtain the evaluation tools of postoperative speech function of oral cancer in existing studies, and summarize the application methods, application scenarios and development status of the postoperative speech function assessment tools for oral cancer. **Methods**·The methodological framework was based on the review method of the Joanna Briggs Institute evidence-based health care center in Australia. The databases included PubMed, Web of Science, Embase, CINAHL, CNKI, Wanfang and VIP. The English terms were ("oral cancer" or "oral cavity cancer" or "head and neck neoplasm\*" [MeSH Terms]) AND ("speech" or "language" [MeSH Terms]) AND ("assess\*" or "evaluat\*" [MeSH Terms]), the Chinese terms were "speech", "speech disorders", "speech function", and the search discipline was limited to "stomatology" or "nursing". The retrieval time was from the establishment of the database to July 2022, and the included literature was summarized and analyzed. **Results**·A preliminary search of 4 476 articles from the literature databases was obtained, excluding duplicate literature, literature that was not relevant to the purpose and content of the study, review literature, non-Chinese or non-English literature, etc. A total of 9 articles were included, including 7 cross-sectional studies and 2 cohort studies. The time range of the included literature was 1990–2022, and the national sources included the United States, Japan, Germany, India, etc. A total of three evaluation methods were summarized, namely scales, automatic identification technology and other methods such as internet of things (IoT) devices, in which scale evaluation is currently the most mainstream evaluation method, and speech handicap index (SHI) is one of the most widely used evaluation scales, which has been culturally adapted and localized in China, but the evaluation tools of local original research have not been retrieved.

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**Conclusion** Among the oral cancer postoperative speech assessment tools, the scale is the most widely used method, but there are few studies that can balance subjective speech assessment and objective speech assessment, and the domestic related research is vacant. In the future, relevant research can be carried out in combination with these two aspects, and a tool for assessing speech function after oral cancer surgery suitable for local languages can be developed.

**[Key words]** speech function; oral cancer; evaluation tool; postoperation; scoping review

口腔癌是头颈颌面部最常见的恶性肿瘤,其中90%以上是黏膜鳞状细胞癌<sup>[1]</sup>。据世界卫生组织(World Health Organization, WHO)预测,在未来70年内,其发病率将持续上升<sup>[2-3]</sup>。在WHO最新版的国际分类系统(International Classification of Diseases-10, ICD-10)中,口腔癌与咽癌归为一类,成为口腔与咽癌(oral and pharyngeal cancer, OPC)或简称口腔癌,包括唇、舌根、舌其他部位、龈、口底、腭、口腔其他部位、腮腺、其他大唾液腺、扁桃体、口咽、鼻咽、梨状窝、下咽等其他部位<sup>[4]</sup>。由于口腔癌的特殊性,肿瘤会造成言语等功能障碍,严重降低患者的生存质量<sup>[5]</sup>。在绝大多数国家,手术是治疗口腔癌的首选方法<sup>[6]</sup>。手术的目的是充分清除肿瘤组织,之后接受重建手术,以恢复外观和功能。游离皮瓣移植是目前口腔重建最流行和最可靠的技术之一,但目前还没有一种皮瓣可以完全解决口腔缺损的问题<sup>[7-8]</sup>。口腔形态的异常对语音有显著的影响<sup>[9]</sup>,而口腔癌的手术治疗往往会导致口腔生理结构的缺失,从而出现言语障碍。口腔颌面恶性肿瘤患者的5年生存率相对其他癌症患者来说较高,这意味着有很多因手术切除而导致的言语功能障碍的口腔癌幸存者<sup>[10-11]</sup>。彭翠娥等<sup>[12]</sup>提到,口腔癌术后有66.7%的患者会出现发声或讲话问题,间接地影响了患者的心理状况和社会活动,从而导致了生活质量的下降。言语评估对口腔癌术后患者的康复及护理来说是重要一环,言语功能的训练和恢复至关重要;但目前口腔癌术后言语功能评估的方法仍无统一标准,国内对此的研究寥寥无几。因此本研究通过范围综述的方法,综合整理口腔癌术后言语功能评估工具的研究,了解该领域的发展状况,希冀为未来的临床实践及相关研究提供参考。

## 1 资料与方法

### 1.1 研究方法

采用澳大利亚JBI (Joanna Briggs Institute) 循证

卫生保健中心范围综述的方法为方法学框架<sup>[13]</sup>,检索和分析国内外口腔癌术后言语功能评估工具的相关研究。

### 1.2 主要研究问题

①现有研究中有哪些口腔癌术后言语功能的评估工具。②口腔癌术后言语功能评估工具的应用方法、应用场景及发展现况。

### 1.3 文献纳入和排除标准

文献纳入标准:①研究对象:口腔癌术后患者,手术方式不限,患者年龄不限。②研究发表时间:不限。③研究内容:口腔癌术后言语功能的评估结局或口腔癌术后言语功能评估方法的研究,其中言语功能指个体间交往表达意识活动和思维过程的方式,包括言语的产生和言语的识别<sup>[9]</sup>。④语言:中文或英文。排除标准:①重复性研究。②无法获取原文。③未提及口腔癌术后言语功能的评估方法或评估结果。④指南、综述类研究、病例报告研究及会议论文。

### 1.4 检索策略

检索库包含PubMed、Web of Science、Embase、CINAHL、CNKI、万方、维普,以PubMed为例,英文检索词为("oral cancer" or "oral cavity cancer" or "head and neck neoplasm\*" [MeSH Terms]) AND ("speech" or "language" [MeSH Terms]) AND ("assess\*" or "evaluat\*" [MeSH Terms]),中文检索关键词为“言语”“言语障碍”“言语功能”,检索学科限定为“口腔医学”或“护理学”。检索时间限制为建库至2022年7月。

### 1.5 文献筛选

将检索出的结果导入EndNote 2.0软件做去重处理,由2名经培训的研究者(第一作者和第二作者)根据纳入和排除标准对文献进行筛选。研究者通过阅读题目和摘要进行初筛,再阅读全文进行二次筛选,

通过互相讨论来达成一致的意见。若筛选的过程中出现分歧,则与第三名研究者(第三作者)讨论解决,最终确定符合研究目的标准的文献。

## 1.6 资料提取

由2名研究人员对纳入文献独立进行数据提取,提取信息包括年份、国家、研究对象、研究目的、研究设计、样本量、评估方法、测量目标、如何衡量结果及与主要研究问题相关的研究结果。研究者采用统一设计的Excel资料提取表格对文献进行汇总分析。

# 2 结果

## 2.1 文献筛选结果

初步通过检索数据库得到4 476篇文献,其中英

文文献共3 893篇,中文文献共583篇,去除重复文献后剩余3 078篇。通过阅读题目和摘要初筛排除2 870篇文献,排除原因为研究对象不符、研究内容与口腔癌言语功能无关及非中文或英文文献,得到208篇文献。对剩余文献进行阅读全文复筛,排除199篇文献,其中无法获得全文3篇、重复性研究117篇、与主题不符51篇、指南3篇、病例报告研究2篇、综述类研究23篇,最终纳入9篇文献。文献筛选流程见图1。

## 2.2 纳入研究的基本特征

本研究纳入9篇文献,其中包含7项横断面研究和2项队列研究(表1)。纳入文献的时间跨度为1990年至2022年,来源国家包括美国、日本、法国、印度等,研究对象均包含术后口腔癌患者。

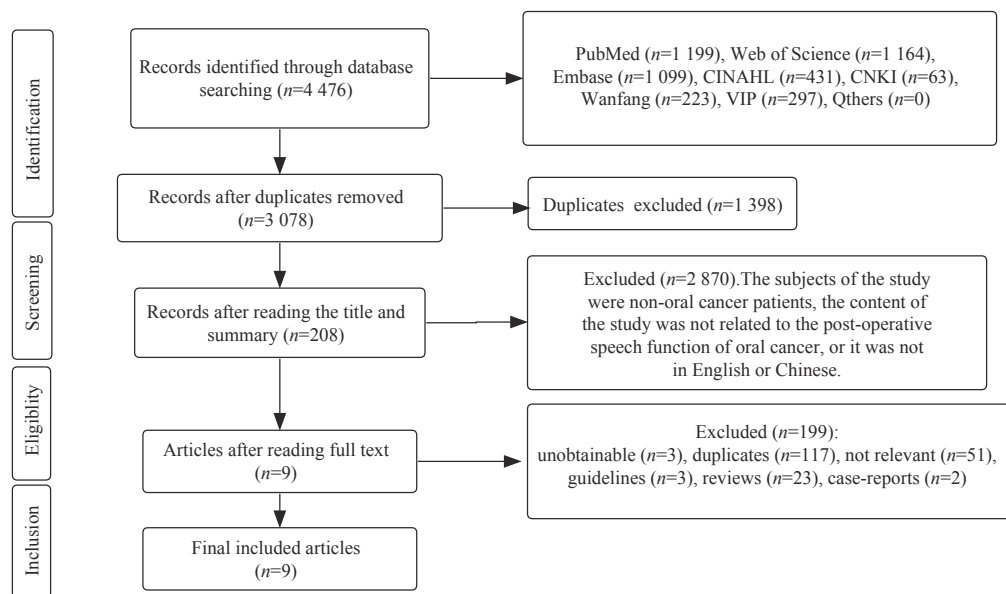


图1 文献筛选流程图

Fig 1 Flow chart of literature selection

## 2.3 口腔癌术后言语功能评估方式的总结

通过文献的内容汇总,归纳出3种类型的评估工具(表2):①量表:可用于评估口腔癌术后言语功能的量表包括言语障碍指数(speech handicap index, SHI)、发声障碍指数(phonation handicap index, PHI)、发音障碍指数(articulation handicap index, AHI)、语音清晰度工具(amrita speech intelligibility assessment tool, ASIAT)、头颈功能状态量表(performance status scale for head and neck, PSS-HN)、功能性口内格拉斯哥评分(functional intraoral Glasgow scale, FIGS)、生命质量测定-头颈部量表

(European organisation for research and treatment of cancer core questionnaire the head and neck 35 module, EORTC QLQ-H&N35)、视觉模拟评分(visual analogue scale, VAS)。②自动化语音识别(automatic speech recognition, ASR)技术:包括软件openSMILE 3.0、软件PRAAT 6.1、软件VOCALAB 4、PEAKS程序,通过计算机自动语音处理,以及测试共振峰等声学数据,得到语音功能的客观评估结果。③其他:皮肤电反应(galvanic skin response, GSR)测量仪以及专家(言语-语言病理学家, speech-language pathologist, SLP)评估。

表1 纳入文献的基本特征

Tab 1 Characteristics of the included studies

Author	Year	Nation	Subjects	Objective	Design	Sample size
WOISARD, et al <sup>[14]</sup>	2022	France	Patients with oropharyngeal or oral cancer who are in the "chronic" stage (i.e., having completed treatment at least 6 months ago) and are in clinical remission, ensuring that the speech impairment is as stable as possible. The control group consisted of the patients' companion to be close to the subjects in terms of age, lifestyle, and location	Through acoustic parameters, an automatic speech severity index model suitable for clinical practice is established to help predict the degree of speech impairment	Cross-sectional studies	87 vs 35
DOKHE, et al <sup>[15]</sup>	2021	India	Patients after oral cancer surgery	It aims to develop a speech intelligibility tool that can perceive and analyze Malayalam	Cross-sectional studies	120
KEILMANN, et al <sup>[16]</sup>	2021	Germany	Survivors of oral cancer (floor of the mouth, tongue, palatine tonsils, base of tongue, palate, jaw, oropharynx, nasopharynx or cheek) who have undergone surgery	To build a simplified assessment tool for measuring the subjective experience of dysphonia	Cross-sectional studies	113
KEILMANN, et al <sup>[17]</sup>	2016	Germany	Patients with treated head and neck tumors. Treatment includes radiotherapy, chemotherapy, immunotherapy and surgery. Head and neck tumors include tumors of the floor of the mouth, tongue, palate, tonsils, base of tongue, maxilla, jaw, oropharynx, nasopharynx and cheeks	To develop the AHI scale and do its psychometric analysis	Cross-sectional studies	113
RIEMANN, et al <sup>[18]</sup>	2015	Germany	Patients with squamous cell carcinoma of the tongue who have undergone surgery	Through the automatic objective speech recognition system, prospective speech intelligibility evaluation was carried out for patients with postoperative oral squamous cell carcinoma	Cohort studies	25 vs 40
ELLABBAN, et al <sup>[19]</sup>	2012	Egypt	Patients with squamous cell carcinoma of the floor of the mouth who have undergone surgery	Oral function was reported by using a FIGS scale to determine the patient's ability to speak, chew, and swallow after surgical treatment for squamous cell carcinoma of the floor of the mouth	Cohort studies	62
RINKEL, et al <sup>[20]</sup>	2008	Netherlands	Oral or pharyngeal cancer that has been treated, including chemotherapy, radiation and surgery	A SHI scale was developed for 92 patients with oral or pharyngeal cancer and 110 healthy patients	Cross-sectional studies	92 vs 110
NISHIGAWA, et al <sup>[21]</sup>	2003	Japan	Patients with maxillary defects after oral cancer surgery	To develop a new method to use galvanic skin response as an indicator of satisfaction with pronunciation function	Cross-sectional studies	11
LIST, et al <sup>[22]</sup>	1990	America	Patients with head and neck tumors	To develop a simple, practical assessment tool to measure function in patients with head and neck tumors in a standard and systematic way	Cross-sectional studies	181

表2 口腔癌术后言语功能的评估工具

Tab 2 Evaluation tools of speech function after oral cancer surgery

Author	Speech-related assessment methods	Purpose of assessment	How to measure results	Key results of the study
WOISARD, et al <sup>[14]</sup>	① SHI ② PHI ③ SLP ④ ASR Systems: openSMILE 3.0, PRAAT 6.1, VOCALAB 4	①SHI is used to assess the degree of speech impairment ②PHI is used to assess the degree of sound impairment ③SLP assesses speech comprehension ④ASR is used to measure speech intelligibility	Eighty-seven patients were treated for oral or oropharyngeal cancer and 35 controls performed different speech-producing tasks and completed questionnaires about speech-related quality of life. The recordings were then evaluated by human perception and automatic speech recognition. A score was derived from a classical Logistic regression model that can describe the severity of the patient's speech disorder	After using three software programs for acoustic treatment, 6 parameters were derived to help predict speech disorders in the future, and the assessment was automated and more reproducible than from manual evaluation
DOKHE, et al <sup>[15]</sup>	ASIAT	ASIAT is used for perceptual analysis of speech functions to obtain speech intelligibility and comprehensibility	Internal consistency and reliability and validity tests	The scale has high internal consistency, with Cronbach's $\alpha$ of 0.847, a strong correlation between Malayalam and English, and a Pearson correlation coefficient of 0.646
KEILMANN, et al <sup>[16]</sup>	① AHI ② Short form AHI-12	AHI-12 is used to assess the degree of dysphonia	Reliability and validity test	The short form AHS-12 questionnaire provides almost as much information as AHI, and it takes significantly less time to complete it. Optimal with 12 entries, Cronbach's $\alpha$ is 0.96
KEILMANN, et al <sup>[17]</sup>	①AHI ②Self-assessment	AHI is used to assess the degree of dysphonia	Cronbach's $\alpha$ values for the AHI scale's item total correlation, principal component analysis, and outcome component. To test its validity, the relationship between AHI and self-evaluation was applied to Kendall's tau values between AHI scores and self-assessments	AHI is one-dimensional, so only a full Cronbach's $\alpha$ coefficient was measured, and Cronbach's $\alpha$ coefficient was 0.96. The AHI score and Kendall's tau value between the self-rating and the self-rating were 0.69 ( $P < 0.001$ )
RIEMANN, et al <sup>[18]</sup>	ASR systems PEAKS (programme for evaluation and analysis for all types speech disorders)	ASR is used to measure speech intelligibility and word recognition rate	Patients were evaluated before surgery, 14–20 d after surgery, 3 months, 6 months and 12 months after surgery, and the cumulative speech function evaluation results of patients were obtained, and then compared between groups	At 12 months before and after surgery, patients developed significant language impairment compared with healthy controls ( $P \leq 0.002$ ). Speech intelligibility decreased significantly 14 to 20 d after surgery ( $P < 0.001$ ), but was readjusted to preoperative levels after 12 months ( $P = 0.159$ ). After 12 months, tongue retention significantly improved speech intelligibility ( $P = 0.007$ )
ELLABBAN, et al <sup>[19]</sup>	FIGS	FIGS is used to assess intraoral function and includes three dimensions: swallowing, speech, and chewing	Patient scoring data were collected preoperatively, 2, 6 and 12 months postoperatively to obtain trends in FIGS scores	The mean baseline speech score was 4.9 points, which decreased to 4.1 points two months after surgery. At 6 and 12 months after surgery, the mean speech score increased to 4.2 and 4.3 at the same time. FIGS is a simple and comprehensive way to assess functional impairment in postoperative patients



Continued Tab

Author	Speech-related assessment methods	Purpose of assessment	How to measure results	Key results of the study
RINKEL, et al <sup>[20]</sup>	① SHI ② EORTC QLQ-H&N35 ③ The control group was asked if they had a question about speaking (answered "yes" or "no")	① SHI is used to assess the degree of speech impairment ② EORTC QLQ-H&N35 is used to assess quality of life in patients with head and neck tumors, including the dimension of speech function	The reliability of the SHI scale was assessed by using internal consistency (Cronbach's $\alpha$ ) and retesting stability (Pearson's $r$ ).	The internal consistency reliability (Cronbach's $\alpha$ coefficient) for the SHI total score was 0.98 in the patient group and 0.92 in the control group, and the Pearson's $r$ coefficients for the total score and subscale were 5.85, 0.83, and 0.72, respectively. The correlation (Pearson's $r$ coefficients) between the SHI Total Score, the SHI Verbal Function Subscale, the SHI Psychosocial Function Subscale, and the EORTC QLQ-H & N35 Speech Scale (Pearson's $r$ coefficients) were 0.86, 0.81, and 0.84, respectively
NISHIGAWA, et al <sup>[21]</sup>	① Speech intelligibility test (assessed by SLP) ② VAS ③ GSR measuring instrument	① VAS is used in patients to self-assess the degree of speech impairment ② GSR judges speech function through the results of the electric skin response	The results of galvanic skin reactions before and after the prostheses were compared	The mean rate of decline in articulation resistance in patients with prostheses was significantly smaller than the value without prostheses, and the results were statistically different ( $P < 0.05$ ), suggesting that wearing prostheses helped with pronunciation
LIST, et al <sup>[22]</sup>	PSS-HN	It is used to evaluate postoperative dietary function, speech comprehension and eating in public in patients with head and neck tumors	Reliability and validity test	The degree of agreement between rater scores was described by using $\kappa$ statistics, $\kappa = 0.88$ [standard error (SE) = 0.08] for a normal diet; Speech comprehensibility $\kappa = 0.64$ (SE = 0.12); Eating in public, $\kappa = 0.78$ (SE = 0.11). Kruskal-Wallis statistics showed that the difference between groups was significant on all three subscales ( $P < 0.05$ )

### 3 讨论

#### 3.1 口腔癌术后言语功能评估方式各有优势

SHI 与 AHI 为在 VHI (voice handicap index) 量表<sup>[23]</sup>基础上改良的言语评估量表<sup>[17,20]</sup>, 两者均为生活质量相关的自评量表, 信效度较高。SHI 包含 30 个条目, 采用 Linkert 评分模式, 包含社会心理及言语功能两个维度的评估, 已被翻译成多种语言版本<sup>[24]</sup>, 其中文版由国内学者吴沛霞等<sup>[25]</sup>汉化完成。中文版 SHI 内容效度指数为 0.90, Cronbach's  $\alpha$  系数为 0.91, 该量表被翻译成多国语言, 广泛应用于头颈肿瘤患者的言语功能评估<sup>[26]</sup>。AHI 在 VHI 的基础上进行修订, 包含 30 个条目, 涵盖身体、功能和情绪 3 个维度, 可得出患者对自身功能缺陷的主观体验评分, 同时 AHI 增加了对语音清晰度和可理解性的修订和调整, 使该

量表适用于任何可能因疾病而出现的发声障碍, Cronbach's  $\alpha$  系数为 0.96<sup>[16-17]</sup>。PHI 量表在口语交际功能的维度具有优势<sup>[14]</sup>, 除了评估言语功能外, 还可了解患者对社交领域的自评。该量表适用于存在构音障碍的患者, 因此也可用于因手术而出现构音障碍的口腔癌患者。在另外一项研究中, PHI 应用于 91 名构音障碍患者, Cronbach's  $\alpha$  系数大于 0.90<sup>[27]</sup>。ASIAT 为基于知觉分析开发的量表<sup>[15]</sup>, 从元音、辅音、单词、段落及整体可理解度 5 个方面评价语音清晰度及词语句子的可理解性, 侧重于语音清晰度的客观评价, 为在口腔癌患者中应用的他评量表, Cronbach's  $\alpha$  系数为 0.847。PSS-HN 量表的评估方式较为特殊<sup>[22]</sup>, 通过结构化访谈的方式, 评估者对患者情况进行一一打分, 得出头颈肿瘤患者饮食、言语功能及公共场所进食 3 个维度的得分, 得到患者整

体的头颈功能状态。FIGS也同为整体功能评估的量表,但倾向于口内功能,包含咀嚼、言语及吞咽3个维度,该评分方式借鉴了格拉斯昏迷评分法,为患者自评<sup>[28]</sup>。EORTC QLQ-H&N35为全面评估患者的功能和生活质量的量表,其中包含评估言语功能的条目,但并不属于专门评估言语功能的量表,该表在头颈肿瘤术后生活质量相关的研究中应用广泛<sup>[18,20]</sup>。GSR通过皮肤电感应的变化推断患者的口内功能,口内功能的评估也包含言语方面的评估<sup>[19,21]</sup>。VAS为视觉模拟评分<sup>[21]</sup>,常用于疼痛的评估,患者通过看游动标尺自行判断言语障碍的程度,较为便捷。ASR是相对来说最为客观的语音清晰度评估方法<sup>[18]</sup>。研发者利用计算机软件收集患者的语音资料,提取声学参数,分析语音的共振峰,得到患者发音清晰的词语比例,该方法可准确得到患者的语音清晰度。各个机构所开发的软件不尽相同,其分析原理也略有差异,虽然结果最为客观,但该方法的应用场景受限,因此临床使用较少<sup>[29]</sup>。以上研究所纳入的样本量不多,其中只有SHI为目前应用较为广泛的评估方法,其他方式的临床应用研究较匮乏,因此需要更大的样本量来证实上述评估方法的有效性和临床适用性。

### 3.2 口腔癌术后言语功能评估工具中主观评估与客观评估的差异

本综述纳入的研究中,量表类的评估工具分为主观自评与客观他评2种方式:主观自评的量表涉及心理、社交、情绪、功能等多个方面,注重患者对自身言语功能的感知和判断;客观他评的量表可收集到患者口腔功能的数据,通过评估者对患者的访谈及经验性评估,对不同维度的条目进行打分,包括舌活动度、语音清晰度、语言可理解性等方面。功能性和生活质量类量表虽然可对患者进行整体性评估,但不推荐作为单独的言语功能评估工具。有研究指出,口腔功能不能完全反映患者在日常生活中感知到的吞咽和言语问题<sup>[30]</sup>。自动语音识别技术应用录音及电脑软件设备,可得到患者的语音清晰度、语言可理解性的数据,是最为客观准确的评估方式,但在临床应用的条件较为受限。CONSTANTINESCU等的研究<sup>[31]</sup>发现,接近一半的样本显示临床评估和患者感知的语音功能障碍程度不一致,这表明临床对言语的评估并不能完全解释患者自身感知的损害程度。BECK-BROICHSITTER

等的研究<sup>[32]</sup>发现,临床专业评估与患者自我评估存在许多差异,患者的自我评估的语音障碍更加严重,这提示应当关注个体的功能期望、主观感受。但目前没有一项工具能同时兼顾主观与客观的言语结果,而患者主观评估与客观评估之间的差异是存在的,这提示收集言语障碍资料时应同时收集客观资料和主观资料,在考量患者语音功能的同时考量社交心理等主观感受。因此在未来评估口腔癌术后患者言语功能时,应兼顾主观和客观的结果,或开发能同时兼顾主客观的评估工具。

### 3.3 量表本土化后的适用性

据文献检索显示,国内目前暂无原创的针对汉语的口腔癌术后言语评估方式。SHI量表虽然已经有汉化版,但在国内检索不到使用该量表的相关研究。KEILMANN等<sup>[17]</sup>在研究中指出,SHI量表的条目对于评估因发音引起的主观损伤并不是最佳的,因此AHI量表对清晰度和可理解度的条目进行了调整。由于语言的差异性,各个国家的言语评估均结合了本土的情况进行改良创新;但在我国上述评估方式的应用还处于起步阶段,ASR技术等客观评估工具的应用也暂未开始。在未来可逐步验证上述工具的本土适用性,也可将国外工具进行汉化和文化调适,或借鉴国外评估方式,研发针对口腔癌术后,更适用于汉语语言环境的评估工具,为国内的口腔癌患者术后言语功能评估提供便利。

### 3.4 小结

本范围综述对口腔癌术后言语功能评估方式的文献进行了全面的检索及总结。涉及的评估工具主要来自国外,包括主观评估量表、自动声学处理评估系统、物联评估技术等,其中自评量表为目前主流的评估方法。国外学者虽已开拓本领域的研究,但仍需要更大的样本量来验证前述的评估工具。值得注意的是,当前国内的相关研究较少,且许多国外的言语功能评估方式未被引入中国,仅有较常使用的SHI已经由中国学者汉化且进行了文化调适。在未来,SHI可进入深化应用阶段。此外,国外的自动声学处理评估系统、物联评估技术具有客观、准确、简便的特点,存在一定的应用价值,研究者可通过改良或创新的方法,研发属于汉语的言语功能评估工具。这将为准确、有效识别患者言语相关症状提

供科学依据,为口腔癌术后言语功能的康复及护理提供针对性建议和支持。

#### 利益冲突声明/Conflict of Interests

所有作者声明不存在利益冲突。

All authors disclose no relevant conflict of interests.

#### 作者贡献/Authors' Contributions

吴媚、侯黎莉参与了研究设计,吴媚、梁妍景参与了写作和修改。

所有作者均阅读并同意了最终稿件的提交。

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[本文编辑] 邵碧云

## 学术快讯

### 上海交通大学公共卫生学院田英、高宇教授团队揭示孕期大气细颗粒物及其主要组分暴露对1岁儿童认知和动作能的影响

2022年12月,上海交通大学公共卫生学院田英、高宇教授团队在 *Environment International* 杂志发表题为 *Effects of prenatal exposure to PM<sub>2.5</sub> and its composition on cognitive and motor functions in children at 12 months of age: the Shanghai Birth Cohort study* 的论文。该研究基于出生队列研究,评估了孕期细颗粒物(particulate matter 2.5, PM<sub>2.5</sub>)及其主要化学组分暴露对1岁儿童的认知和动作能的影响。这项大样本的前瞻性出生队列研究结果揭示了孕期PM<sub>2.5</sub>暴露与儿童认知和动作能之间的负向关联;同时就具体PM<sub>2.5</sub>化学组分,提供了不同组分与多个能区存在负向关联新的流行病学证据支持。该研究结果将有助于促进制定针对特定颗粒物成分的空气质量防治政策,从而对有效降低生命早期PM<sub>2.5</sub>污染引起的神经发育异常风险具有重要意义。