REVIEW ARTICLE

Evaluation of Dietary Assessment among the Publications related with Head and Neck Carcinoma: Bibliometric Analysis

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ABSTRACT

Background: Dietary changes and habits influence risk and prognosis of head and neck cancer (HNC). Diet assessment is part of cancer management; however, related research remain poorly understood. This bibliometric study aimed to evaluate publication trends, key contributors, and thematic focus of diet assessment in HNC. **Methodology:** Scopus database was searched systematically using keywords related to HNC and dietary assessment tools in title, abstract, and keywords of relevant articles. Only peer-reviewed original studies were included; grey literature and unrelated articles were excluded. Data were analysed using Bibliometrix (RStudio) and VOSviewer to explore publication trends, research focus, co-authorship networks, top countries, institutions, authors journals, and emerging keywords. **Results:** From 1975 to 2025, 587 documents from 257 journals were retrieved. Research output increased after 2000, peaking in 2021. Nutrients, Head and Neck, and Supportive Care in Cancer were major publishing venues. USA, Italy, and China led in publication output. **Conclusion:** Diet assessment in HNC is on emphasis in recent decades. Research evolved from identifying risk factors to clinical oncology. Despite its high disease burden, India lags in publication output. More collaboration is required between different income-level countries for creating culturally and regionally adapted diet assessments. Research remains scarce on emerging lifestyle risks.

KEYWORDS

Head and Neck Neoplasms; Diet Assessment Tools; Nutrition Assessment; Food Frequency Questionnaire; 24-Hour Dietary Recall

INTRODUCTION

Head and neck cancer (HNC) poses a major public health burden in India, Asia, and globally. (1–4) As per GLOBOCAN 2022, HNC is the second most common cancer in India and leading cause of cancer-related deaths among Indian men. Asia accounts for 75.1% of global deaths from HNC and globally ranks among top 15 causes of cancer-related mortality.(5) Key risk factors include tobacco, alcohol, and betel quid, especially in Southeast Asia.(6–8) Diet plays dual role: pro-inflammatory foods may increase risk, while fruits, vegetables, and micronutrients offer protection.(9,10) However, limited access to healthy food in low-income regions may exacerbate cancer burden.(11) A clinical trial found that high pre-treatment intake of carbohydrates and sugar was linked to increased mortality in HNC.(12) Among Asian-Indians, diets have shifted toward refined carbs, sugars, fats, and salt due to urbanisation, mirroring Western dietary transitions.(13–15)

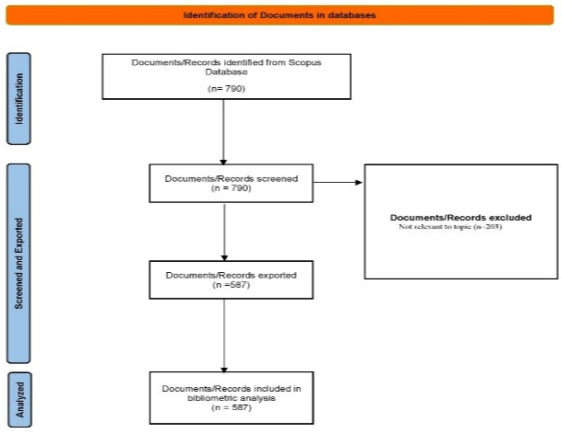
Global and regional nutritional transitions highlight need for reliable dietary assessment to accurately capture risk. Further, dysphagia, loss of appetite or a warped sense of smell or taste leading to cachexia is often reported due to HNC tumour or its treatment; hence dietary assessment becomes crucial for the nutritional management in these patients(16). Clinicians use various methods, including food diaries,duplicate portion method, dietary histories, food frequency questionnaires (FFQs), and 24-hour dietary recalls (24-HDRs).(17) However, these tools face limitations such as recall bias, misreporting, participant literacy dependence, and need for trained personnel. They also require cultural and socioeconomic adaptations.(18,19)

In this bibliometric analysis, we aim to quantify research output, trends, and influence and to identify emerging topics, key contributors, and collaborative networks in dietary assessment within HNC, where this research is non-existent as per our knowledge. (20,21) This analysis is intended to support forecasting future research priorities and guide strategic investments, in nutrition-oncology, particularly in HNC.(22,23)

METHODOLOGY

Data Source and Search Strategy: For this bibliometric analysis an electronic search was conducted in the Scopus database in June 2025, as shown in the PRISMA flow diagram (Figure 1). The strategy combined keywords related to disease terms (e.g., “oral cancer,” “oral squamous cell carcinoma,” “head and neck cancer”) and dietary assessment (e.g., “dietary intake,” “nutrition assessment,” “24-hour recall tool,” “food frequency questionnaire”), applied to titles, abstracts, and keywords.

Figure 1: Search, screening, and analysis process for diet assessment and HNC bibliometric analysis



Inclusion and Exclusion Criteria: Inclusion criteria were peer-reviewed original research articles without publication year limits, focusing on dietary surveys in HNC patients. Exclusion criteria included studies unrelated to these patients or diet assessments, review, conference abstracts, letters, short reports, and editorials.

Bibliometric Analysis: To conduct the bibliometric analysis, the Bibliometrix R package (version 4.3.0) and its web-based interface Biblioshiny were used in RStudio (version 2024.12.0 + 467, Kousa Dogwood, Boston, MA).(21) Two authors independently reviewed the search results for inclusion (MY and MP). Any conflicts were resolved after reanalysis and discussion. Final included eligible search results were exported in CSV format and imported into Bibliometrix for data processing. Biblioshiny was employed to generate descriptive statistics related to productivity. The historiograph, leading countries, institutions, authors, and journals were identified, and frequent keywords were analyzed. Co-authorship analysis was performed using the biblioNetwork() function, focusing on author collaborations with at least 15 shared publications. Community detection was conducted using the Louvain clustering algorithm. Additionally, VOSviewer software was used to construct and visualise bibliometric networks based on citation, and keyword co-occurrence (supplementary figures).(24)

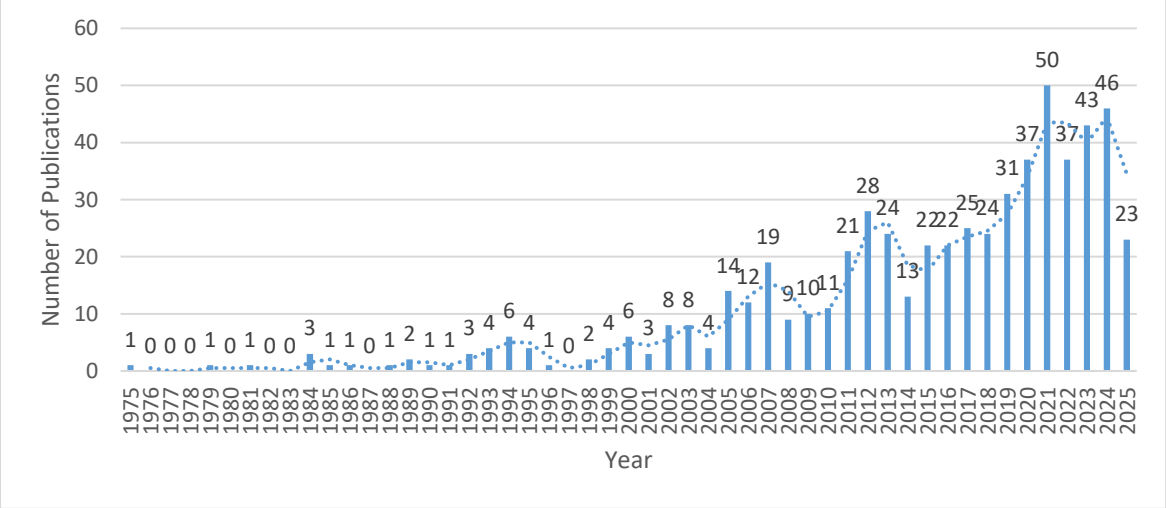
RESULTS

Overview of Data: The present bibliometric analysis of retrieved papers showed publications on diet assessment in HNC from 1975 to 2025. It included 257 journals, which collectively yielded a total of 587 publications (Figure 1). A total of 19841 citations were received, with an average of 33.8 citations to each publication. There are 4,383 keywords in the indexing database linked to publications, whereas 1,116 keywords were used by authors, indicating a substantial scope of thematic relevance. There are 3,232 authors who contributed to 587 publications, with 23 authors publishing 24 single-authored documents. The average number of co-authors per document is 7.32, with 19.42% of documents arising from international co-authorships.

Publication Trends over Time

The analysis traced publication trends on diet assessment and HNC, beginning with a 1975 case-control study by Feldman and Hazan in *Preventive Medicine*.(25) A sharp rise in output after the early 2000s reflects growing research interest (Figure 2).

Figure 2: Publication trends over the years related to diet assessment in HNC patients. The number of publications identified through the bibliometric search is plotted annually from 1975 to 2025.

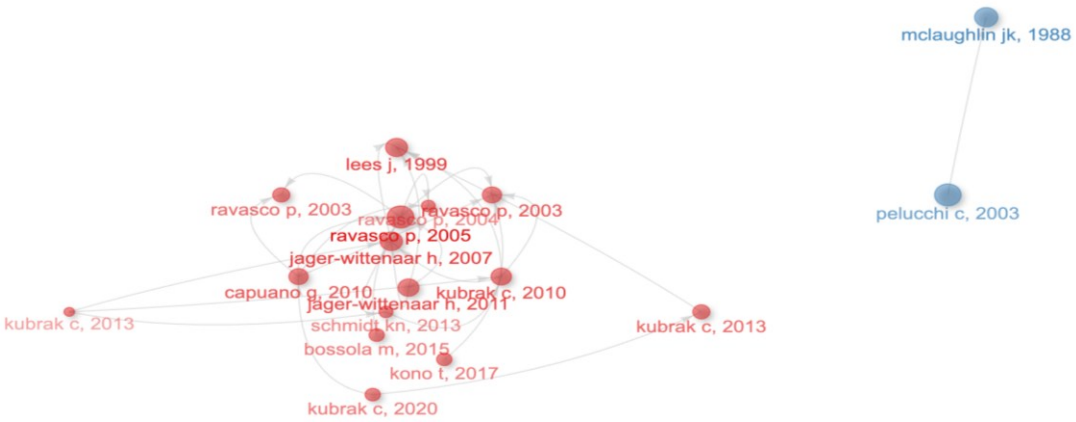


Thematic Evolution

Figure 3 and supplementary Table 1 illustrate the evolution of diet-related research in HNC over the past five decades. The historiograph reveals two major research clusters. The blue cluster (Cluster 1) comprises early studies by McLaughlin JK (1988) and Pelucchi C (2003), which focused on dietary risk factors and the etiological role of nutrition in oral and pharyngeal cancers.(26,27) These foundational works framed diet as a modifiable risk factor in cancer development.

The red cluster (Cluster 2) reflects a shift from etiological associations to clinical nutrition research. From the late 1990s onward, studies by Lees J (1999), Ravasco P (2003–2005), Jager-Wittenaar H (2007, 2011), and Kubrak C (2010–2020) explored malnutrition, nutrition impact symptoms, and quality of life during treatment.(28–39) This cluster emphasises assessment tools, weight loss predictors, and interventional strategies, marking a transition toward supportive nutritional care in HNC.

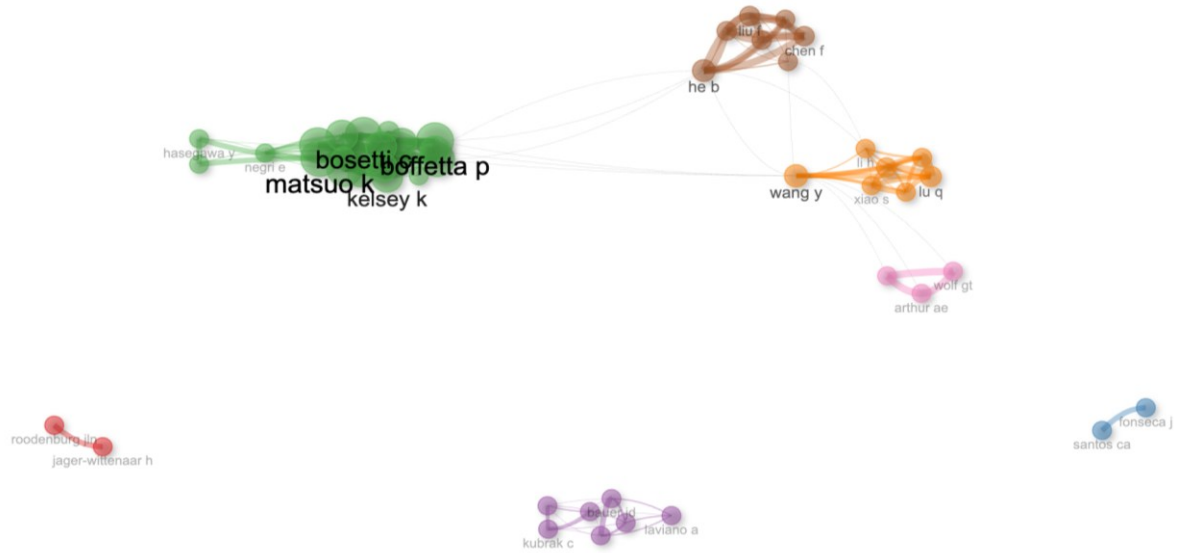
Figure 3: Historiograph shows how key publications have developed over time by citing each other within a specific bibliographic dataset.(20)



Author-Collaboration Networks

The co-authorship network (Figure 4) reveals seven distinct clusters of authors working on diet assessment in HNC. Cluster 3 (green) is the most densely connected and includes key influencers such as Hashibe M. (betweenness = 109.2), Boffetta P. (106.6), and Matsuo K. (58.9), indicating their central role in bridging author groups. Cluster 5 (orange) includes Wang Y., who has the highest betweenness score (249.6), reflecting strong inter-group connectivity. Similarly, He B. in Cluster 6 (brown) also demonstrates a high betweenness (164.6), showing strong collaborative influence. In contrast, Clusters 1, 2, and 7 include isolated authors such as Jager-Wittenaar H., Fonseca J., and Arthur AE, with no recorded betweenness, suggesting limited integration in the broader research network.

Figure 4: Author collaboration network in diet assessment in HNC research. Each node represents an author, grouped into colour-coded clusters based on co-authorship patterns.(42)



Country and Institution Contributions: With a total of 580 papers as of 2025, the USA leads among countries, followed by China with 310 and Japan with 202. Italy, Canada, the Netherlands, and Spain have 193, 117, 113, and 101 publications, respectively. Other contributing countries include Australia (99), Brazil (99), and the United Kingdom (81). India produced 55 publications in our study period. The USA was the first country to publish in 1975. China showed a notable increase as well, starting from two articles in 1994 and rising to 310 by 2025; Japan's output increased from one in 1994 to 202 by 2025. Similarly, Italy also saw an increase in publications from five in 2000 to 193 by 2025.

Authors from 1,242 institutions contributed to 587 papers on diet and cancer. The University of Alberta led with 49 publications, followed by the University of Michigan (37) and the National Cancer Institute (20). Other major contributors included Fuijan Medical University (19), Chang Gung Memorial Hospital, University Medical Center Groningen, and University of Groningen (17 each), as well as Chang Gung University (16), the International Agency for Research on Cancer (13), Radboud University (12), and Mahidol and Peking Universities (11 each). The USA led in both single-country publications (SCP = 77) and multi-country publications (MCP = 11), with 88 papers overall. China followed with 81 publications (71 SCP, 10 MCP). Overall, SCPs (389) far outnumbered MCPs (99), indicating limited international collaboration in this field.

The USA had the highest citation count with 3,683 total citations and an average of 41.9 per publication. Italy followed with 1,396 citations (avg. 55.8), and Portugal stood out with the highest average (121.6) from 1,216 citations. Canada (1,282; avg. 49.3), the Netherlands (890; avg. 59.3), and Germany (581; avg. 72.6) also showed strong citation performance. China had 1,120 citations with a lower average of 13.8 despite high output. Japan (900; avg. 19.1), Spain (888; avg. 46.7), and Australia (590; avg. 31.1) were also among the top cited countries.

Top Authors and Co-cited Authors: Examining contributions in terms of published papers highlights strong collaborative efforts and a diverse group of researchers who have significantly contributed to the field of diet assessment in HNC (Table 1). The variation in fractionalized counts reflects differences in individual authorship contributions, highlighting how some researchers played lead roles while others collaborated as part of larger teams.

Table 1: Leading authors in diet assessment research related to HNC, ranked by number of publications. The fractionalized count represents each author's relative contribution by dividing authorship credit among all co-authors of a paper.

Author	Number of Publications	Fractionalized Count	Sample References
Wang Y	15	1.47444174	(40,41)
La Vecchia C	13	1.3074499	(42,43)
Boffetta P	12	0.78930518	(9,44)
Matsuo K	12	0.82973843	(9,45)
Jin S	11	1.36396104	(45,46)
Zhang L	11	1.49686147	(47,48)
Kubrak C	10	1.54160562	(36,45)
Liu F	10	0.83341658	(49,50)
Arthur AE	9	1.08095238	(51,52)
Bosetti C	9	0.65284033	(9,42)
Hashibe M	9	0.47787637	(53,54)
He B	9	0.71174333	(55,56)
Lu Q	9	1.10638528	(57,58)

Core Journal and Citation Metrics

The bibliometric analysis of published sources on diet assessment and HNC showed that *Nutrients* published 30 articles (supplementary Figure 1). Other journals included *Head and Neck* with 28 articles and *Supportive Care in Cancer* with 27. *Nutrition and Cancer* and *Clinical Nutrition* contributed 20 and 19 articles, respectively. *International Journal of Cancer* had 16 articles, while *European Archives of Oto-Rhino-Laryngology*, *Laryngoscope*, and *Nutricion Hospitalaria* each published ten articles. *Oral Oncology* published 9 articles. The VOS viewer citation network (Supplementary Figure 2) displays journals by citation frequency, with larger nodes indicating journals more frequently cited within the dataset.

The most cited documents in the field of diet assessment and HNC reflect substantial impact (supplementary Figure 3). Ravasco et al.'s 2005 paper in Head & Neck leads with 470 citations (22.4/year), followed by their 2004 study in Supportive Care in Cancer with 288 citations, underscoring their key contributions.(31,32) Weimann et al. (2021) received 460 citations in Clinical Nutrition (92/year), and Terry et al. (2011) was cited 295 times in Epigenetics.(59,60) Other influential works include McLaughlin (1988) and Carnaby-Mann (2012).(26,61)

The h-index is a combined metric of both publication quantity and citation quality, making it a valuable bibliometric indicator to assess journal influence in advancing research on nutrition-related outcomes in HNC management.(62) The journals *Head and Neck* and *Supportive Care in Cancer* each had an h-index of 17 (supplementary Figure 4). *International Journal of Cancer* followed with an h-index of 15, and *Clinical Nutrition* had an h-index of 14. *Nutrients* reported an h-index of 13, while *Nutrition and Cancer* had an h-index of ten. *European Archives of Oto-Rhino-Laryngology*, *Laryngoscope*, and *Oral Oncology* each had an h-index of eight. The journal *Nutrition* had the lowest among the listed sources, with an h-index of seven.

Keyword and Thematic Analysis

The keyword analysis reveals a strong focus on "head and neck cancer," which stands out with 144 occurrences, underscoring its prominence in the literature related to nutrition and oncology. The term "malnutrition" also emerges as an important area, appearing 76 times in several publication on diet and cancer. Clearly, this indicates impact of diet/nutrition on patients with cancer, particularly those undergoing treatments such as radiotherapy, which has 37 mentions. Other significant keywords included "oral cancer" (48 occurrences), "nutrition" (43 occurrences), and "diet" (36 occurrences). Furthermore, the increasing frequency of the keywords "quality of life," and "dysphagia" between 2010 and 2020 signifies a growing significance in the oncology domain, with "diet" gaining relevance from 1999 onwards. The frequent co-occurrence of the keywords "male," "female," and "aged" indicated a correlation between diet/nutrition and the demographic characteristics of cancer. Our VOSviewer analysis shows that author keyword map appears less dense than the indexed keyword map indicating that authors use a more limited vocabulary (supplementary Figure 5).

Country-Collaboration Networks

In the collaboration network, the USA and Italy emerged as key hubs, leading international efforts in diet assessment and HNC. The USA collaborated

as first author with 36 countries, and Italy with 32. Other active contributors included Japan, Spain, and the UK, primarily partnering with high-income nations. Japan collaborated most with Italy (n = ten) and Switzerland (n = six), while Spain's key partners included France, Germany, Greece, Norway, and the UK (≥five each). Despite high output, China had limited first-author international collaborations (seven countries), mainly with Japan (n = six), Italy (n = four), and Switzerland (n = four), indicating a more domestic research focus. India showed minimal engagement, with only four first-author collaborations—two with Iran and one each with Ethiopia and Turkey.

DISCUSSION

Our bibliometric analysis offers insight into the growing research focus on dietary assessment in cancer care, particularly for HNC. A total of 587 publications have contributed in the field of dietary assessment tools. The USA, China, and Japan have published the most. The USA also had the highest citation count. University of Alberta, University of Michigan, and National Cancer Institute had maximum output. Wang Y, La Vecchia C and Boffetta P are the most published authors. Journals with the highest volume include *Nutrients*, *Head and Neck,* and *Supportive Care in Cancer*. Some emerging keywords included "quality of life", "dysphagia", and "diet". High-income countries like the US, Italy and Japan led collaborations in the field.

Evidence increasingly shows that diet significantly influences treatment outcomes, prognosis, and quality of life, a trend reflected in the rising volume of related publications.(10,63,64) While growing evidence links refined carbohydrate intake to cancer risk, its specific association with HNC remains underexplored.(65–67) The simultaneous rise in refined carbohydrate consumption and HNC incidence in India suggests a potential etiological link.(5,71) However, the literature lacks longitudinal and mechanistic studies to clarify the impact of long-term high-carbohydrate diets on head and neck carcinogenesis. While high-impact journals such as *Nutrients*, *Head and Neck*, and *Supportive Care in Cancer* are active platforms for research in this field, there is a noticeable underrepresentation of diet-related research in HNC specific journals including *oral oncology*. This suggests that, although the broader oncology field is increasingly acknowledging the importance of nutrition, the oral oncology community is yet to integrate dietary assessment into its core research agenda.

Geographic disparities were also evident, with the USA, Japan, China, and Italy and their research organisations, leading in publications and citations, while India—despite its unique dietary risk factors (e.g., betel quid)—was significantly underrepresented (68). This imbalance reflects broader systemic issues, including limited research funding in India (69). The low rate of international collaborations (19.4% of papers) further exacerbates this issue, restricting the development of culturally adapted dietary assessment tools and regionally relevant interventions. International collaborations with low- and middle-income countries (LMICs) were limited. Only a few connections were observed between countries like Ethiopia, Iran, and India and major research economies. Despite India's high burden of HNC, its institutions were underrepresented in high-impact publications on diet surveys and cancer. This highlights the need for greater research investment, interdisciplinary training, and academic visibility in such regions. Dedicated funding and collaboration schemes could help bridge the gap between high-output countries and underrepresented areas with significant disease burden (70).

It is worth noting that, despite the widespread use of FFQs and 24-HDRs, more suitable tools are needed to ensure that findings from bibliometric analyses can be translated into clinically relevant applications. Cancer patients often face challenges with dietary recall due to fatigue or cognitive burden from treatment, and may also experience altered taste or appetite as a result of chemotherapy or radiation (71). In particular, OSCC patients commonly suffer from dysphagia and oral mucositis, which significantly impair their ability to consume and report food intake accurately (72).

The author-collaboration network highlights that a handful authors play a central role in influencing collaborations and are well connected to other researchers, but mostly in isolated clusters. Looking forward, inter-disciplinary collaboration will be paramount. Integrating the expertise of nutritionists, oncologists, dietitians, and researchers will likely yield comprehensive frameworks for developing effective diet assessment tools. Future research should aim to rigorously validate these tools in larger, more diverse populations, alongside a robust examination of the long-term impact of diet on cancer survivorship, treatment tolerance, and recurrence. While keep in mind that the tool needs to be user-friendly, scalable that can be implemented in real-world clinical settings, particularly in resource-constrained environments.

Conclusion

In summary, a rise in publications was observed from 1975 to 2025, during which research focus shifted from risk factors to supportive nutritional care in the field of diet assessment in HNC. The USA and its institutions topped in terms of publication volume, highest citation count, origin country of most published journals and as a central hub of collaboration in the field. Collaboration from rich economies should extend to poorer economies, this can promote research on context-sensitive, validated diet assessment tools. India needs to enhance its research capacity, given its high mortality from HNC and emerging dietary risk factors such as higher intake of carbohydrates.

Recommendation

Studying dietary assessments related to head and neck cancer in India is crucial for identifying risk factors and developing targeted prevention strategies. This research can guide public health initiatives to promote helathier eating habits and reduce cancer incidence in high-risk populations.

Limitation of the Study

Our bibliometric investigation spans 50 years of research (1975 to 2025) using Scopus, a high-coverage multidisciplinary database, and robust tools such as Bibliometrix, Biblioshiny and VOSviewer. The search strategy and inclusion/exclusion criteria followed a PRISMA-guided approach for transparency and reproducibility. However, the use of a single database and the English language may have biased the inclusion of literature and associated metrics. Our focus on diet survey tools covered both nutritive and non-nutritive risk factors, such as betel quid and alcohol. However, research studying the impact of addictive substances such as betel quid, outside of a diet assessment framework, was not included. This may have contributed to the underrepresentation of high-burden countries like India. Lastly, we have utilised arriving at a thematic conclusion based on keywords, which are voluntarily assigned by authors and journals, may be inaccurate.

Relevance of the Study

This study add to current knowledge by identifying specific gaps in the research on dietary assessments related to head and neck cancer, particularly in the context of India. It emphasises the importance of understanding local dietary patterns and their potential influence on cancer risk, thereby highlighting the need for targeted research in diverse populations. Furthermore, it advocates for international collaboration to enhance the study of dietary impacts on head and neck cancer, suggesting that such partnerships could lead to more comprehensive and applicable findings that consider cultural and regional dietary variations.

Authors Contribution

MY: Concepts, design, definition of intellectual content, literature search, data acquisition, data analysis, manuscript preparation. SMM: Concepts, statistical analysis, visualisation, data acquisition, manuscript preparation. KKRE: Concepts, design, definition of intellectual content, methodology, data analysis, manuscript review, guarantor. MP: Design, definition of intellectual content, data acquisition, data analysis, manuscript preparation. SJ: Design, definition of intellectual content, data analysis, manuscript preparation, manuscript editing. TA: Design, data analysis, manuscript preparation, manuscript review. PD: Design, data analysis, manuscript preparation, manuscript review.

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Nil

Conflict of Interest

Nil

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None

Declaration of Generative AI and AI Assisted Technologies in the Writing Process

The authors haven't used any generative AI/AI assisted technologies in the writing process.

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