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**Abstract**

**Background:** Citations analysis is one of the most widely used bibliometric tools to evaluate the academic importance of a study in a specific area of knowledge. The objective of the present study was to identify the 100 most cited articles on oral cancer and to analyse their principal characteristics.

**Methods:** We performed a literature search in the Web of Science database using the Science Citation Index Expanded tool to determine the number of citations of all articles on oral cancer identified up to 10th August 2017. The 100 most referenced articles were then selected and the following information was gathered: ranking based on the number of citations; citation density; citations in Scopus; number and names of the authors; language and year of publication; country and institution of origin; financial support; journal of publication, with its impact factor, category and quartile; type of research; evidence level; and area of study.

**Results:** The number of citations of the 100 articles varied from 1959 to 165, and the number of authors from a single author to 23. The oldest article was from 1948 and the most recent was from 2013. All the studies were published in English, the majority (56%) was from the United States and 80% were published in journals in the first quartile.

**Conclusions.** The majority of articles were of studies that had received financial support, were published in journals with a high impact factor and were focussed on the aetiology and pathogenesis of oral cancer.

## Introduction

Citations analysis is one of the most widely used bibliometric tools to evaluate the academic importance of an article in a specific area of knowledge [1]. The number of citations that a publication receives does not necessarily reflect the quality of the research or the relevance of its authors [2], but it has been suggested that articles with a larger number of citations may have the capacity to generate changes in clinical practice, controversy, discussion, and further research [3].

Reviews have been published on the most cited articles in various disciplines, including oncology [4] and dentistry [5]. However, no systematic analyses of this type have yet been

published on oral cancer. The objective of the present study was therefore to identify the 100 most cited articles on oral cancer and to analyse their principal characteristics.

## Material and Methods

A title search with no language restriction was performed in the *All Databases* section of the Web Of Science (WOS) database, applying the search strategy described in Table 1. The SCIE index was used to determine the number of citations for each of the articles on oral cancer identified between 1900 and August 10th, 2017.

The 100 most cited articles were selected and the full text of each one was obtained. The following information was gathered in a standardised manner from each study:

- Number and density of citations. The articles were positioned in the ranking according to the number of citations recorded in the WOS database. The relative impact of the published papers was evaluated by calculating citation density (mean number of citations per year = total number of citations/years since publication of the article). In the case of studies with an equal absolute number of citations, the article with the highest citation density was positioned higher in the heirachial order of the ranking. We also analysed the number of citations of the 100 selected articles in the Scopus database.

- Authors, language and year of publication. We recorded the number and names of the authors, the language and the year of publication of each article.

- Institution/department, country of origin and financial support. We registered the institution/department and country of origin of the first author. We also analysed the existence of specific financial support.

- Journal, category, quartile, and impact factor. For each article, we recorded the journal in which it was published and the impact factor (IF), category or categories and quartile of the journal (2016 Journal of Citation Reports (JCR): Science Edition). In the case of journals classified into several categories, we recorded the quartile of the category or categories in which the journal was best positioned.

- Type of research, evidence level and area of study. Articles were classified as primary research studies (basic, clinical or epidemiological) or secondary research (narrative review, systematic review or meta-analysis) [6]. The evidence level was analysed using the classification proposed by the Oxford Centre for Evidence-Based Medicine [7]. The evidence level was not recorded for basic research as the classification system was not applicable to these studies. We also analysed the specific area of study of each paper (diagnosis, epidemiology, aetiology and pathogenesis, management of the complications of oral cancer, clinical-pathological presentation, prevention, prognosis and treatment).

Two independent reviewers (MPC and MDF) performed the selection and subsequent analysis of the articles. In case of discrepancy, we used the opinion of a third reviewer to reach consensus (PDD).

**Results**

- Number of citations and citation density

With the search strategy applied, we obtained a total of 40,234 results in the WOS database. From this collection we selected the 100 most cited articles (Table 2). The number of citations registered ranged from 1,959 to 165 (mean 294±237); the total number of citations was 29,449.The most cited article, was a study published by Slaughter et al. [8] in 1953 in the journal *Cancer*; this study analysed the microscopic multicentric origin of oral squamous cell carcinoma (OSCC) through a process of field cancerization.The following article, with 1,116 citations, reported a basic research study that analysed the usefulness of the optical properties of antibody-conjugated gold nanoparticles for the detection of oral cancer cells; the paper was published by El-Sayed et al. [9] in 2005 in the journal *Nano Letters*. The third most cited article, with 1,045 citations, was published by Blot et al. [10] in 1988 in the journal *Cancer Research*. In that study the authors analysed the potential impact of smoking and drinking on the epidemiology of oral and pharyngeal cancer in the United States of America (USA).

The article with the highest citation density and, therefore, the greatest relative impact, was the study by Warnakulasuriya [11] with a mean of 92 citations per year.

In the Scopus database, the number of citations for each of the 100 selected articles ranged from 2,099 to 160 (mean 315±260); the total number of citations was 31,548. The most cited article in the WOS was the same as the most cited article in Scopus. However, Scopus recorded a higher number of citations than the WOS for 77% of the selected articles, a lower number in 19%, and in only 4% did the 2 databases showed concordance in the number of citations recorded.

- Authors, language and year of publication

The mean number of authors was 6±4, with a range between a single author (8 articles) and 23 authors in a multicentre study by Herrero et al. [12]; the most frequent number of authors was 4 (15 articles). There were fewer than 10 authors in 86 studies. In total, more than 500 researchers participated in the 100 most cited articles on oral cancer. In quantitative terms, 14 authors stood out because they hadcontributed in at least 3 studies included in this ranking (Table 3).

All the articles were written in English. The oldest publication was the one by Ackerman [13], published in 1948 in the journal *Surgery*. That article was a narrative review on the clinical and pathological characteristics of verrucous carcinoma of the oral cavity. The most recent article was published by Chaturvedi et al. [14] in 2013 in the *Journal of Clinical Oncology*. Their article described an epidemiological research study of the worldwide trends in incidence rates for oral cavity and oropharyngeal cancers in relation to human papillomavirus (HPV) infection.

The majority of the selected studies were published inthe decade 2000-2009 (46%), followed by thedecade 1990-1999 (26%) and 1980-1989 (16%). The mean number of citations recorded in the WOS database was higher for the articles published in the decade 1950-1959, with 1,202 citations, followed by the decade 1940-1949, with 499 citations.

- Institution/department, country of origin and financial support

The MD Anderson Cancer Centre of the University of Texas, with 7 articles included in this bibliometric analysis, was the institution with the greatest scientific representation (Table 4).

The 100 most cited articles on oral cancer came from 22 different countries. The USA stands out as the country of origin of 56% of the articles, followed by the United Kingdom and China, with 8 and 5 articles, respectively.

Specific financial support was grantedto 56% of the studies. The decades with the largest number of studies that received financial support were 2000-2009 (n=27) and 1990-1999 (n=16).

- Journal, Category, Quartile and Impact Factor

The 100 most cited articles on oral cancer were published in 39 different scientific journals (Table 5), 26 of which were positioned in the first quartile of their category, 9 in the second and only 1 in the third; 80% of studies were published in journals included in the first quartile. The *Scandinavian Journal of Dental Research, Archives of Otolaryngology-Head and Neck Surgery* and the *Journal of Chronic Diseases and Management* were the journals that werenot included in the 2016 JCR: Science Edition. The journal with the largest number of studies included in this ranking was *Cancer,* with 11 articles, followed by *Oral Oncology* and *Clinical Cancer Research* with 9.

The most frequent category of journals in which the most cited articles were published was Oncology (n=14), followed by, Dentistry, Oral Surgery & Medicine (6) and Surgery (5).

The impact factor (IF) of the journals in which the 100 articles were published varied from 187.040 to 1.416 (mean 10.975±21.604). The journal with the highest IF was *CA: A Cancer Journal for Clinicians*, which, in 2002, published a narrative review by Neville et al. [15] on the clinical and pathological presentation of oral cancer and of precancerous lesions. The journal

with the lowest IF was *Oral Surgery Oral Medine Oral Pathology Oral Radiology*, in which 3 of the selected articles were published.

- Type of research, evidence level and area of study

The majority of articles were classified as primary research (n=81); in this group there was a predominance of clinical research (n=30) over basic (n=27) or epidemiological (n=24) research. With regard to secondary research (n=19), the majority were narrative reviews (n=17); there were only 2 meta-analyses. The most cited meta-analysis, with 275 citations in WOS, was published by Miller et al. [16] in 2001 in *Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics*. That study focused on the role of HPV as a risk factor for OSCC.

The majority of studies were classified asevidence level 4 (n=45); only 2 articles (the meta-analyses) were considered level 1. The 17 narrative reviews were classified as level 5. We also calculated the mean number of citations in the WOS for the articles in each evidence level; this was highest for articles in evidence level 4 (mean 329±300), followed by level 5 (mean 275±176).

The predominant area of study was the aetiopathogenesis of oral cancer (42%), followed by prognosis (16%) and treatment (11%). The most widely studied risk factor was tobacco, including chewing tobacco and other products, followed by HPV and alcohol.

**Discussion**

It has been suggested that "classic papers" are those that have received 100 or more citations [17]; all the studies included in this analysis can therefore be considered classic.

The time factor has a clear influence on citation analysis. Recently published articles are at a disadvantage and could be underrated with regard to their scientific impact as they have had less time to accumulate citations [18]. In contrast, the oldest articles may have a high number of citations independently of their current impact [19].

The decade with publication of the largest number of articles in this ranking was 2000-2009. This finding contrast with recent reviews by other authors, on other topics and specialties, in which the majority of the most cited papers were published in the 1990s [17,20,21]. It may appear surprising that the studies with the largest number of citations are recent studies; among other factors, this could be due to the appearance of scientific journals in electronic format, facilitating access and thus favouring circulation in the scientific community.

All the articles included in this analysis were published in English and the majority of papers analysed were published by institutions in the USA, as has been found in bibliometric studies performed in other disciplines [3,12,20,22]. The USA has a strong influence on research in the

health sciences; this can be attributed to the high level of grant support given to research in that country and the large number of American scientists [23].

The 100 most cited articles on oral cancer were published in scientific journals with a high IF, the majority of which were in the first quartile for their category. Thus a significant number of studies were concentrated in a limited nucleus of journals, as has been observed in other bibliometric reviews [18]; this phenomenon is known as Bradford's Law [24,25]. Authors are attracted to journals with a higher IF, as studies published in such journals will presumably receive a larger number of citations, thus maintaining the IF of the journals [34]. Open-access journals also have appeal as they can be consulted easily and thus attract more citations.

In recent years, great importance has been given to evidence-based dentistry and medicine, and efforts are being made to improve the quality of research. However, the large majority of the most cited articles in the field of oral cancer had a low evidence level. It has been suggested that the most cited articles are not necessarily those with greatest scientific rigour [27]; this is supported by our study and other similar studies, in which the evidence level of the majority of articles had level 4 [3,12].

Apart from the WOS, there are a number of databases that allow us to calculate the number of citations of a publication, including Google Scholar and Scopus [35]. In our study, we used the WOS database as it is widely recognised and accepted by the scientific community for performing bibliometric research, probably as it was the first to incorporate a tool for citation analysis. It has been shown that the WOS, Google Scholar and Scopus vary considerably in the number of citations assigned to an individual article. In general, Scopus and Google Scholar assign slightly higher citation values than the WOS [27]. We analysed the number of citations assigned by Scopus to the 100 selected articles and also found that the total number of citations was higher than in the WOS.

This study has certain limitations that must be taken into account. In the scientific literature, a large number of expressions and definitions are used to refer to oral cancer, making it difficult to locate and analyse information on the disease [28]. For this reason, a number of authors have highlighted the importance of the need for a clear definition of the term "oral cancer", the anatomical sites and the types of malignant neoplasm associated with this term [29]. In our study, we used more than 20 search terms, combined using a wildcard character in order to identify the largest possible number of articles on oral cancer.

Perhaps the greatest limitation of the present study is the possible omission of highly cited articles not detected by the search methods employed; there may be articles or additional citations in journals not included in the WOS database. In addition, this research strategy was orientated towards studies that included the selected keywords in their title. This may have excluded studies that are relevant to oral cancer but that did not include these terms in their title. However, subject searches return numerous results not related to the subject of interest, and further article selection is therefore required, with the consequent risk of creating a new bias [22].

Citation analysis is not a perfect measure of the impact of an article in its field [18], as numerous factors influence the number of times a study is cited, including research quality, importance of the subject matter and the capacity to generate changeor stimulate future research. Although the citation index is not a direct measure of quality or importance, it does enable us to quantitatively evaluate the scientific impact of a publication.

There is a tendency in the scientific community to adhere to a paradigm; in the present context, we find that authors tend to prefer to cite articles that have previously been cited in other studies, independently of their content or quality, leading to a "snowball effect" [30]. Unfortunately, some authors may not review the primary sources of citation and simply use those listed by other investigators [5].A further factor is that some authors have a tendency to cite their own research and that of their colleagues in order to increase their number of citations and *h* index, or to mention studies by known reviewers [23]. However, the percentage of self-citation in the 100 studies analysed as calculatedwith the WOS was of only 0.65%.

The selected articles are considered important in the field of oral oncology as they can provide information on advances in the knowledge of oral cancer, the areas of most intense study and the future objectives of research. This is also relevant from an educational and economic point of view. First, it is considered that the most cited articles could be included in training programmes, as they should form part of the knowledge base of clinicians and investigators in contact with this disease. Also, citation analysis is one of the tools that allow us to quantitatively analyse the scientific production of an investigator or any research group; this is taken into ever greater account when attempting to obtain financial support for research.

## Conclusions

In summary, the 100 most cited articles on oral cancer were all published in English and the majority were from the decade 2000-2009, originated from the USA and received financial support for their undertaking. The majority of articles were published in journals with a high IF, and there was a predominance of clinical research. The evidence level was generally low. The aetiopathogenesis of oral cancer was the most common field of study, specifically tobacco smoking, HPV and alcohol intake.

## Compliance with ethical standards

**Conflict of interest:** The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

**Ethical approval:** Not required for this type of study.

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8. Slaughter DP, Southwick HW, Smejkal W. Field cancerization in oral stratified squamous epithelium-clinical implications of multicentric origin. *Cance*r 1953; 6: 963-968.

9. El-Sayed IH, Huang XH, El-Sayed MA. Surface plasmon resonance scattering and absorption of anti-EGFR antibody conjugated gold nanoparticles in cancer diagnostics: Applications in oral cancer. *Nano Letter*s 2005; 5: 829-834.

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12. Herrero R, Castellsague X, Pawlita M, et al. Human papillomavirus and oral cancer: The international agency for research on cancer multicenter study. *J Natl Cancer Ins*t 2003; 95: 1772-1783.

13. Ackerman LV. Verrucous carcinoma of the oral cavity. *Surger*y 1948; 23: 670-678.

14. Chaturvedi AK, Anderson WF, Lortet-Tieulent J, et al. Worldwide trends in incidence rates for oral cavity and oropharyngeal cancers. *J Clin Onco*l 2013; 31: 4550-4559.

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|---|
| Title = oral cancer* OR oral carcino* OR oral squamous cell carcino* OR oral tumor* OR oral tumour* OR oral malign* OR oral cancer* lesion* OR oral neoplasm* OR oral cavity cancer* OR mouth cancer* OR mouth carcino* OR mouth neoplasm* OR mouth tumor* OR mouth tumour* OR tongue cancer* OR tongue carcino* OR tongue neoplasm* OR tongue tumor* OR tongue tumour* OR intraoral cancer* OR malign* oral tumor* OR malign* oral tumour* |

Table 1. Search strategy.

| Ranking position | Article | Web of Science Citations | Web of Science Citation Density | Scopus Citations |
|---|---|---|---|---|
| **1** | Slaughter DP, Southwick HW, Smejkal W. Field cancerization in oral stratified squamous epithelium - clinical implications of multicentric origin. Cancer 1953; 6: 963-8. | 1,959 | 30.14 | 2,099 |
| **2** | El Sayed IH, Huang XH, El Sayed MA. Surface plasmon resonance scattering and absorption of anti-EGFR antibody conjugated gold nanoparticles in cancer diagnostics: applications in oral cancer. Nano Lett 2005; 5: 829-34. | 1,116 | 85.85 | 1,261 |
| **3** | Blot WJ, Mclaughlin JK, Winn DM, et al. Smoking and drinking in relation to oral and pharyngeal cancer. Cancer Res 1988; 48: 3282-7. | 1,045 | 34.90 | 1,178 |
| **4** | Warnakulasuriya S. Global epidemiology of oral and oropharyngeal cancer. Oral Oncol 2009; 45: 309-16. | 835 | 92.78 | 926 |
| **5** | ChaturvediAK, Engels EA, Anderson WF, Gillison ML. Incidence trends for human papillomavirus-related and unrelated oral squamous cell carcinomas in the United States. J Clin Oncol 2008; 26: 612-9. | 713 | 71.30 | 774 |
| **6** | Herrero R, Castellsague X, Pawlita M, et al. Human papillomavirus and oral cancer: the international agency for research on cancer multicenter study. J Natl Cancer Inst 2003; 95: 1772-83. | 689 | 45.93 | 767 |
| **7** | Soulieres D, Senzer NN, Vokes EE, Hidalgo M, Agarwala SS, Siu LL. Multicenter phase II study of erlotinib, an oral epidermal growth factor receptor tyrosine kinase inhibitor, in patients with recurrent or metastatic squamous cell cancer of the head and neck. J Clin Oncol 2004; 22: 77-85. | 526 | 37.64 | 621 |
| **8** | Ackerman LV. Verrucous carcinoma of the oral cavity. Surgery 1948; 23: 670-8. | 499 | 7.13 | 508 |
| **9** | Neville BW, Day TA. Oral cancer and precancerous lesions. CA-Cancer J Clin 2002; 52: 195-215. | 493 | 30.81 | 568 |

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|---|---|---|---|---|
| **10** | Wong T, Liu X, Wong BY, Ng RW, Yuen AP, Wei WI. Mature miR-184 as potential oncogenic microRNA of squamous cell carcinoma of tongue. Clin Cancer Res 2008; 14: 2588-92. | 492 | 49.20 | 491 |
| **11** | Winn DM, Blot WJ, Shy CM, Pickle LW, Toledo A, Fraumeni JF. Snuff dipping and oral cancer among women in the Southern United States. N Engl J Med 1981; 304: 745-9. | 450 | 12.19 | 412 |
| **12** | Wynder EL, Bross IJ, Feldman RM. A study of the etiological factors in cancer of the mouth. Cancer 1957; 10: 1300-23. | 446 | 7.31 | 334 |
| **13** | **Ko YC, Huang YL, Lee CH, Chen MJ, Lin LM, Tsai CC. Betel quid chewing, cigarette smoking and alcohol consumption related to oral cancer in Taiwan. J Oral Pathol Med 1995; 24: 450-3.** | **422** | **18.35** | **460** |
| **14** | Rothman K, Keller A. Effect of joint exposure to alcohol and tobacco on risk of cancer of mouth and pharynx. J Chronic Dis 1972; 25: 711-6. | 407 | 8.85 | 378 |
| **15** | Shiboski CH, Schmidt BL, Jordan RCK. Tongue and tonsil carcinoma - increasing trends in the US population ages 20-44 years. Cancer 2005; 103: 1843-9. | 405 | 31.15 | 469 |
| **16** | Kozaki K, Imoto I, Mogi S, Omura K, Inazawa J. Exploration of tumor suppressive microRNAs silenced by DNA hypermethylation in oral cancer. Cancer Res 2008; 68: 2094-2105. | 382 | 38.20 | 405 |
| **17** | Franceschi S, Talamini R, Barra S, et al. Smoking and drinking in relation to cancers of the oral cavity, pharynx, larynx, and esophagus in northern italy. Cancer Res 1990; 50: 6502-7. | 379 | 13.54 | 422 |
| **18** | Schwartz SM, Daling JR, Doody DR, et al. Oral cancer risk in relation to sexual history and evidence of human papillomavirus infection. J Natl Cancer Inst 1998; 90: 1626-36. | 365 | 18.85 | 421 |
| **19** | Chiou S, Yu C, Huang C, et al. Positive correlations of Oct-4 and Nanog in oral cancer stem-like cells and high grade oral squamous cell carcinoma. Clin Cancer Res 2008; 14: 4085-95. | 361 | 36.10 | 369 |
| **20** | Park NJ, Zhou H, Elashoff D, et al. Salivary microRNA: discovery, characterization and clinical utility for oral cancer detection. Clin | 348 | 38.67 | 370 |

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|---|---|---|---|---|
| | Cancer Res 2009; 15: 5473-7. | | | |
| **21** | Kraus FT, Perezmesa C. Verrucous carcinoma - clinical and pathologic study of 105 cases involving oral cavity larynx and genitalia. Cancer 1966; 19:+. | 345 | 6.63 | 329 |
| **22** | Matsumoto K, Matsumoto K, Nakamura T, Kramer RH. Hepatocyte growth factor scatter factor induces tyrosine phosphorylation of focal adhesion kinase (P125 (fak)) and promotes migration and invasion by oral squamous cell carcinoma cells. J Biol Chem 1994; 269: 31807-13. | 317 | 13.25 | 306 |
| **23** | Lippman SM, Batsakis JG, Toth BB, et al. Comparison of low-dose isotretinoin with beta-carotene to prevent oral carcinogenesis. N Engl J Med 1993; 328: 15-20. | 314 | 12.56 | 308 |
| **24** | Spiro RH, Huvos AG, Wong GY, Spiro JD, Gnecco CA, Strong EW. Predictive value of tumor thickness in squamous carcinoma confined to the tongue and floor of the mouth. Am J Surg 1986; 152: 345-50. | 302 | 9.44 | 357 |
| **25** | Shah JP, Candela FC, Poddar AK. The patterns of cervical lymph-node metastases from squamous carcinoma of the oral cavity. Cancer 1990; 66: 109-13. | 292 | 10.43 | 313 |
| **26** | Miller CS, Johnstone BM. Human papillomavirus as a risk factor for oral squamous cell carcinoma: a meta-analysis, 1982-1997. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2001; 91: 622-35. | 275 | 16.18 | 315 |
| **27** | O'malley BW Jr., Weinstein GS, Snyder W, Hockstein NG. Transoral robotic surgery (TORS) for base of tongue neoplasms. Laryngoscope 2006; 116: 1465-72. | 269 | 22.42 | 328 |
| **28** | Smith EM, Ritchie JM, Summersgill KF, et al. Age, sexual behavior and human papillomavirus infection in oral cavity and oropharyngeal cancers. Int J Cancer 2004; 108: 766-72. | 265 | 18.93 | 304 |
| **29** | Li Y, St John MA, Zhou XF, et al. Salivary transcriptome diagnostics for oral cancer detection. Clin Cancer Res 2004; 10: 8442-50. | 256 | 18.29 | 287 |
| **30** | Tanaka T, Kojima T, Kawamori T, et al. Inhibition of 4-nitroquinoline-1-oxide-induced rat tongue carcinogenesis by the naturally- | 256 | 10.24 | 283 |

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|---|---|---|---|---|
| | occurring plant phenolicscaffeic, ellagic, chlorogenic and ferulic acids. Carcinogenesis 1993; 14: 1321-5. | | | |
| **31** | Anneroth G, Batsakis J, Luna M. Review of the literature and a recommended system of malignancy grading in oral squamous cell carcinomas. Scand J Dent Res 1987; 95: 229-49. | 255 | 8.23 | 305 |
| **32** | Ritchie JM, Smith EM, Summersgill KF, et al. Human papillomavirus infection as a prognostic factor in carcinomas of the oral cavity and oropharynx. Int J Cancer 2003; 104: 336-44. | 254 | 16.93 | 299 |
| **33** | Franco EL, Kowalski LP, Oliveira BV, et al. Risk factors for oral cancer in Brazil: a case control study. Int J Cancer 1989; 43: 992-1000. | 251 | 8.66 | 270 |
| **34** | Graham S, Dayal H, Rohrer T, et al. Dentition, diet, tobacco, and alcohol in epidemiology of oral cancer. J Natl Cancer Inst 1977; 59: 1611-8. | 245 | 5.98 | 223 |
| **35** | Sankaranarayanan R, Ramadas K, Thomas G, et al. Effect of screening on oral cancer mortality in Kerala, India: a cluster-randomised controlled trial. Lancet 2005; 365: 1927-33. | 244 | 18.77 | 275 |
| **36** | Lumerman H, Freedman P, Kerpel S. Oral epithelial dysplasia and the development of invasive squamous-cell carcinoma. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1995; 79: 321-9. | 244 | 10.61 | 273 |
| **37** | Mashberg A, Boffetta P, Winkelman R, Garfinkel L. Tobacco smoking, alcohol-drinking, and cancer of the oral cavity and oropharynx among united-states veterans. Cancer 1993; 72: 1369-75. | 243 | 9.72 | 284 |
| **38** | Vandenbrouck C, Sanchogarnier H, Chassagne D, Saravane D, Cachin Y, Micheau C. Elective versus therapeutic radical neck dissection in epidermoid carcinoma of the oral cavity - results of a randomized clinical-trial. Cancer 1980; 46: 386-90. | 242 | 6.37 | 270 |
| **39** | Massano J, Regateiro FS, Januario G, Ferreira A. Oral squamous cell carcinoma: review of prognostic and predictive factors. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006; 102: 67-76. | 238 | 19.83 | 255 |

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| **40** | Lavecchia C, Tavani A, Franceschi S, Levi F, Corrao G, Negri E. Epidemiology and prevention of oral cancer. Oral Oncol 1997; 33: 302-12. | 237 | 11.29 | 279 |
| **41** | Sakai E, Tsuchida N. Most human squamous cell carcinomas in the oral cavity contain mutated p53 tumor-suppressor genes. Oncogene 1992; 7: 927-33. | 236 | 9.08 | 214 |
| **42** | Mclaughlin JK, Gridley G, Block G, et al. Dietary factors in oral and pharyngeal cancer. J Natl Cancer Inst 1988; 80: 1237-43. | 236 | 7.87 | 236 |
| **43** | Hu S, Arellano M, Boontheung P, et al. Salivary proteomics for oral cancer biomarker discovery. Clin Cancer Res 2008; 14: 6246-52. | 232 | 23.20 | 255 |
| **44** | Li J, Huang H, Sun L, et al. MiR-21 indicates poor prognosis in tongue squamous cell carcinomas as an apoptosis inhibitor. Clin Cancer Res 2009; 15: 3998-4008. | 231 | 25.67 | 245 |
| **45** | Chaturvedi AK, Anderson WF, Lortet-Tieulent J, Curado MP, Ferlay J, Franceschi S, Rosenberg PS, Bray F, Gillison ML. Worldwide trends in incidence rates for oral cavity and oropharyngeal cancers. J Clin Oncol 2013; 31: 4550-9. | 230 | 46.00 | 241 |
| **46** | Xia WY, Lau YK, Zhang HZ, et al. Combination of EGFR, HER-2/neu, and HER-3 is a stronger predictor for the outcome of oral squamous cell carcinoma than any individual family members. Clin Cancer Res 1999; 5: 4164-74. | 228 | 12.00 | 233 |
| **47** | Llewellyn CD, Johnson NW, Warnakulasuriya, K A A S. Risk factors for squamous cell carcinoma of the oral cavity in young people-a comprehensive literature review. Oral Oncol 2001; 37: 401-18. | 227 | 13.35 | 277 |
| **48** | Hu L, Crowe DL, Rheinwald JG, Chambon P, Gudas LJ. Abnormal expression of retinoic acid receptors and keratin-19 by human oral and epidermal squamous-cell carcinoma cell-lines. Cancer Res 1991; 51: 3972-81. | 226 | 8.37 | 205 |
| **49** | Lo TCM, Wiley AL, Ansfield FJ, et al. Combined radiation-therapy and 5-fluorouracil for advanced squamous-cell carcinoma of oral cavity and oropharynx - randomized study. Am J Roentgenol 1976; 126: 229-35. | 226 | 5.38 | 186 |

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| **50** | Byers RM, Weber RS, Andrews T, McGill D, Kare R, Wolf P. Frequency and therapeutic implications of "skip metastases" in the neck from squamous carcinoma of the oral tongue. Head Neck 1997; 19: 14-9. | 224 | 10.67 | 249 |
| **51** | Urken ML, Buchbinder D, Weinberg H, et al. Functional evaluation following microvascular oromandibular reconstruction of the oral cancer patient: a comparative study of reconstructed and nonreconstructed patients. Laryngoscope 1991; 101: 935-50. | 224 | 8.30 | 253 |
| **52** | Devilliers EM, Weidauer H, Otto H, Zurhausen H. Papillomavirus DNA in human tongue carcinomas. Int J Cancer 1985; 36: 575-8. | 223 | 6.76 | 204 |
| **53** | Elwood JM, Pearson JCG, Skippen DH, Jackson SM. Alcohol, smoking, social and occupational factors in the etiology of cancer of the oral cavity, pharynx and larynx. Int J Cancer 1984; 34: 603-12. | 223 | 6.59 | 233 |
| **54** | Kunkel M, Reichert TE, Benz P, et al. Overexpression of Glut-1 and increased glucose metabolism in tumors are associated with a poor prognosis in patients with oral spuamous cell carcinoma. Cancer 2003; 97: 1015-24. | 219 | 14.60 | 233 |
| **55** | Glaser CM, Millesi W, Kornek GV, et al. Impact of hemoglobin level and use of recombinant erythropoietin on efficacy of preoperative chemoradiation therapy for squamous cell carcinoma of the oral cavity and oropharynx. Int J Radiation Oncol Biol Physics 2001; 50: 705-15. | 216 | 12.71 | 241 |
| **56** | Shah JP, Gil Z. Current concepts in management of oral cancer- surgery. Oral Oncol 2009; 45: 394-401. | 212 | 23.56 | 222 |
| **57** | Brugere J, Guenel P, Leclerc A, Rodriguez J. Differential-effects of tobacco and alcohol in cancer of the larynx, pharynx, and mouth. Cancer 1986; 57: 391-5. | 211 | 6.59 | 233 |
| **58** | Grant WE, Hopper C, Macrobert AJ, SPEIGHT PM, BOWN SG. Photodynamic therapy of oral cancer- photosensitization with systemic aminolevulinic acid. Lancet 1993; 342: 147-8. | 210 | 8.40 | 210 |
| **59** | Maciejewski B, Withers HR, Taylor JMG, Hliniak A. Dose fractionation and regeneration in radiotherapy for cancer of the oral cavity and | 210 | 7.24 | 225 |

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| | oropharynx - tumor dose-response and repopulation. Int J Radiation Oncol Biol Physics 1989; 16: 831-43. | | | |
| **60** | Lingen MW, Kalmar JR, Karrison T, Speight PM. Critical evaluation of diagnostic aids for the detection of oral cancer. Oral Oncol 2008; 44: 10-22. | 209 | 20.90 | 253 |
| **61** | Kim JW, Wieckowski E, Taylor DD, Reichert TE, Watkins S, Whiteside TL. Fas ligand-positive membranous vesicles isolated from sera of patients with oral cancer induce apoptosis of activated T lymphocytes. Clin Cancer Res 2005; 11: 1010-20. | 207 | 15.92 | 208 |
| **62** | Kurahara S, Shinohara M, Ikebe T, et al. Expression of MMPs, MT-MMP, and TIMPs in squamous cell carcinoma of the oral cavity: Correlations with tumor invasion and metastasis. Head Neck-J Sci Spec Head Neck 1999; 21: 627-38. | 205 | 10.79 | 215 |
| **63** | Kligerman J, Lima RA, Soares JR, et al. Supraomohyoid neck dissection in the treatment of T1/t2 squamous-cell carcinoma of oral cavity. Am J Surg 1994; 168: 391-4. | 205 | 8.54 | 218 |
| **64** | Syrjanen K, Syrjanen S, Lamberg M, Pyrhonen S, nuutinen J. Morphological and immunohistochemical evidence suggesting human papillomavirus (HPV) involvement in oral squamous cell carcinogenesis. Int J Oral Surg 1983; 12: 418-24. | 205 | 5.86 | 226 |
| **65** | Funk GF, Karnell LH, Robinson RA, Zhen WNK, Trask DK, Hoffman HT. Presentation, treatment, and outcome of oral cavity cancer: a national cancer data base report. Head Neck-J Sci Spec Head Neck 2002; 24: 165-80. | 202 | 12.62 | 216 |
| **66** | Silverman S. Demographics and occurrence of oral and pharyngeal cancers - the outcomes, the trends, the challenge. J Am Dent Assoc 2001; 132: 11S. | 199 | 11.71 | 288 |
| **67** | Bryne M, Koppang HS, Lilleng R, KjaerheimA. Malignancy grading of the deep invasive margins of oral squamous cell carcinomas has high prognostic value. J Pathol 1992; 166: 375-81. | 198 | 7.62 | 231 |
| **68** | Smith BD, Smith GL, Carter D, Sasaki CT, Haffty BG. Prognostic significance of vascular | 197 | 10.94 | 201 |

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| | endothelial growth factor protein levels in oral and oropharyngeal squamous cell carcinoma. J Clin Oncol 2000; 18: 2046-52. | | | |
| **69** | Malhotra R, Patel V, Vaque JP, Gutkind JS, Rusling JF. Ultrasensitive electrochemical immunosensor for oral cancer biomarker IL-6 using carbon nanotube forest electrodes and multilabel amplification. Anal Chem 2010; 82: 3118-23. | 196 | 24.50 | 200 |
| **70** | Petersen PE. Oral cancer prevention and control- the approach of the World Health Organization. Oral Oncol 2009; 45: 454-60. | 195 | 21.67 | 212 |
| **71** | Loning T, Ikenberg H, Becker J, Gissmann L, Hoepfer I, Hausen HZ. Analysis of oral papillomas, leukoplakias, and invasive carcinomas for human papillomavirus type related dna. J Invest Dermatol 1985; 84: 417-20. | 193 | 5.85 | 199 |
| **72** | Martinez I. Factors associated with cancer of esophagus, mouth, and pharynx in puertorico. J Natl Cancer Inst 1969; 42: &. | 192 | 3.92 | 161 |
| **73** | Saranath D, Chang SE, Bhoite LT, et al. High-frequency mutation in codons 12 and 61 of H-Ras oncogene in chewing tobacco-related human oral carcinoma in India. Br J Cancer 1991; 63: 573-8. | 189 | 7.00 | 193 |
| **74** | Winn DM, Ziegler RG, Pickle LW, Gridley G, Blot WJ, Hoover RN. Diet in the etiology of oral and pharyngeal cancer among women from the southern united-states. Cancer Res 1984; 44: 1216-22. | 188 | 5.53 | 176 |
| **75** | Day GL, Blot WJ. 2nd primary tumors in patients with oral cancer. Cancer 1992; 70: 14-9. | 187 | 7.79 | 214 |
| **76** | Saunders WS, Shuster M, Huang X, et al. Chromosomal instability and cytoskeletal defects in oral cancer cells. Proc Natl Acad Sci USA 2000; 97: 303-8. | 186 | 10.33 | 197 |
| **77** | Loree TR, Strong EW. Significance of positive margins in oral cavity squamous carcinoma. Am J Surg 1990; 160: 410-4. | 186 | 6.64 | 206 |
| **78** | Nair U, Bartsch H, Nair J. Alert for an epidemic of oral cancer due to use of the betel quid substitutes gutkha and pan masala: a review of agents and causative mechanisms. Mutagenesis | 185 | 13.21 | 240 |

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| | 2004; 19: 251-62. | | | |
| **79** | Mcgregor IA. The temporal flap in intra-oral cancer: its use in repairing the post-excisional defect. Br J Plast Surg 1963; 16: 318-35. | 185 | 3.36 | 171 |
| **80** | Choi S, Myers JN. Molecular pathogenesis of oral squamous cell carcinoma: implications for therapy. J Dent Res 2008; 87: 14-32. | 183 | 18.30 | 194 |
| **81** | Woolgar JA. Histopathological prognosticators in oral and oropharyngeal squamous cell carcinoma. Oral Oncol 2006; 42: 229-39. | 181 | 15.08 | 195 |
| **82** | Kantak SS, Kramer RH. E-cadherin regulates anchorage-independent growth and survival in oral squamous cell carcinoma cells. J Biol Chem 1998; 273: 16953-61. | 179 | 8.95 | 176 |
| **83** | Sano D, Myers JN. Metastasis of squamous cell carcinoma of the oral tongue. Cancer Metastasis Rev 2007; 26: 645-62. | 177 | 16.09 | 169 |
| **84** | Yuan P, Temam S, El-Naggar A, et al. Overexpression of podoplanin in oral cancer and its association with poor clinical outcome. Cancer 2006; 107: 563-9. | 176 | 14.67 | 183 |
| **85** | Yuen APW, Wei WI, Wong YM, Tang KC. Elective neck dissection versus observation in the treatment of early oral tongue carcinoma. Head Neck-J Sci Spec Head Neck 1997; 19: 583-8. | 176 | 8.38 | 181 |
| **86** | Fakih AR, Rao RS, Borges AM, Patel AR. Elective versus therapeutic neck dissection in early carcinoma of the oral tongue. Am J Surg 1989; 158: 309-13. | 176 | 6.07 | 204 |
| **87** | Kademani D. Oral cancer. Mayo Clin Proc 2007; 82: 878-87. | 174 | 15.82 | 180 |
| **88** | Snijders AM, Schmidt BL, Fridlyand J, et al. Rare amplicons implicate frequent deregulation of cell fate specification pathways in oral squamous cell carcinoma. Oncogene 2005; 24: 4232-42. | 173 | 13.31 | 182 |
| **89** | Muller MG, Valdez TA, Georgakoudi I, et al. Spectroscopic detection and evaluation of morphologic and biochemical changes in early human oral carcinoma. Cancer 2003; 97: 1681-92. | 172 | 11.47 | 187 |

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|---|---|---|---|---|
| **90** | Schwartz SR, Yueh B, McDougall JK, Daling JR, Schwartz SM. Human papillomavirus infection and survival in oral squamous cell cancer: A population-based study. Otolaryngol Head Neck Surg 2001; 125: 1-9. | 172 | 10.12 | 195 |
| **91** | St John, MA, Li Y, Zhou XF, et al. Interleukin 6 and interleukin 8 as potential biomarkers for oral cavity and oropharyngeal squamous cell carcinoma. Arch Otolaryngol Head Neck Surg 2004; 130: 929-35. | 171 | 12.21 | 212 |
| **92** | Scully C, Field JK, Tanzawa H. Genetic aberrations in oral or head and neck squamous cell carcinoma (SCCHN): 1. carcinogen metabolism, DNA repair and cell cycle control. Oral Oncol 2000; 36: 256-63. | 171 | 9.50 | 191 |
| **93** | Spiro RH, Alfonso AE, Farr HW, Strong EW. Cervical node metastasis from epidermoid carcinoma of oral cavity and oropharynx - critical assessment of current staging. Am J Surg 1974; 128: 562-7. | 171 | 3.89 | 171 |
| **94** | Hecht SS, Rivenson A, Braley J, Dibello J, Adams JD, Hoffmann D. A study of tobacco carcinogenesis .32. induction of oral cavity tumors in F344 rats by tobacco-specific nitrosamines and snuff. Cancer Res 1986; 46: 4162-6. | 170 | 5.31 | 165 |
| **95** | Rogers SN, Brown JS, Woolgar JA, et al. Survival following primary surgery for oral cancer. Oral Oncol 2009; 45: 201-11. | 169 | 18.77 | 175 |
| **96** | Alevizos I, Mahadevappa M, Zhang X, et al. Oral cancer in vivo gene expression profiling assisted by laser capture microdissection and microarray analysis. Oncogene 2001; 20: 6196-204. | 167 | 9.82 | 167 |
| **97** | Bova RJ, Quinn DI, Nankervis JS, et al. Cyclin D1 and p16INK4A expression predict reduced survival in carcinoma of the anterior tongue. Clin Cancer Res 1999; 5: 2810-9. | 167 | 8.79 | 181 |
| **98** | Pavia M, Pileggi C, Nobile CG, Angelillo IF. Association between fruit and vegetable consumption and oral cancer: A meta-analysis of observational studies. Am J Clin Nutr 2006; 83: 1126-34. | 165 | 13.75 | 171 |
| **99** | Martin-Villar E, Scholl FG, Gamallo C, et al. Characterization of human PA2.26 antigen (T1 | 165 | 12.69 | 160 |

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| | alpha-2, podoplanin), a small membrane mucin induced in oral squamous cell carcinomas. Int J Cancer 2005; 113: 899-910. | | | |
| **100** | Byers RM, El-Naggar AK, Lee YY, et al. Can we detect or predict the presence of occult nodal metastases in patients with squamous carcinoma of the oral tongue? Head Neck 1998; 20: 138-44. | 165 | 8.25 | 193 |

Table 2. The 100 most cited articles on oral cancer.

| **Name** | **First Author** | **Co-author** | **Last author** | **Total** |
|---|---|---|---|---|
| Blot, WJ | 1 | 4 | 0 | 5 |
| Franceschi, S | 1 | 2 | 1 | 4 |
| Fraumeni, JF | 0 | 0 | 4 | 4 |
| Winn, DM | 2 | 2 | 0 | 4 |
| Abemayor, E | 0 | 3 | 0 | 3 |
| Austin, DF | 0 | 3 | 0 | 3 |
| Elashoff, D | 0 | 3 | 0 | 3 |
| Greenberg, RS | 0 | 3 | 0 | 3 |
| Jordan, RCK | 0 | 2 | 1 | 3 |
| McLaughlin, JK | 1 | 2 | 0 | 3 |
| Prestonmartin, S | 0 | 3 | 0 | 3 |
| Schoenberg, JB | 0 | 3 | 0 | 3 |
| Strong, EW | 0 | 0 | 3 | 3 |
| Wong, DT | 0 | 0 | 3 | 3 |

Table 3. Authors with at least 3 articles included in the top 100.

| Institution/Department | Country | Number of Articles |
|---|---|---|
| M.D. Anderson Cancer Center, University of Texas,Houston | USA | 7 |
| National Cancer Institute, Bethesda, Maryland | USA | 6 |
| Memorial Sloan-Kettering Cancer Center, New York | USA | 6 |
| University of California, San Francisco | USA | 6 |

Table 4. Institutions and departments with the highest representation in this ranking.

| JournalName (*abbreviated*) | Impact Factor (2016 JCR: Science Edition) | Quartile | Category/ies | Number of Articlesin the top 100 |
|---|---|---|---|---|
| Cancer *(Cancer)* | 5.997 | 1 | -Oncology | 11 |
| Clinical Cancer Research *(Clin Cancer Res)* | 9.619 | 1 | -Oncology | 9 |
| CancerResearch *(Cancer Res)* | 9.122 | 1 | -Oncology | 6 |
| Journal of the National Cancer Institute *(J Natl Cancer Inst)* | 12.589 | 1 | -Oncology | 6 |
| International Journal of Cancer *(Int J Cancer)* | 6.513 | 1 | -Oncology | 6 |
| American Journal of Surgery *(Am J Surg)* | 2.612 | 2 | -Surgery | 5 |
| Head and Neck-Journal for the Sciences and Specialties of the Head and Neck *(Head Neck-J Sci Spec Head Neck)* | 3.376 | 1 | -Otorhinolaryngology<br>-Surgery | 5 |
| Journal of Clinical Oncology *(J ClinOncol)* | 24.008 | 1 | -Oncology | 4 |
| Oncogene *(Oncogene)* | 7.519 | 1 | -Oncology<br>-Biochemistry & Molecular Biology<br>-Cell Biology | 3 |

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|---|---|---|---|---|
| | | | -Genetics&Heredity | |
| Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics[c] *(Oral Surg Oral Med Oral Pathol Oral RadiolEndod)* | 1.416 | 3 | -Dentistry, Oral Surgery& Medicine | 3 |
| International Journal of Radiation Oncology Biology Physics *(Int J RadiatOncolBiol Phys)* | 5.133 | 1 | -Oncology<br>-Radiology, Nuclear Medicine & Medical Imaging | 2 |
| Journal of Biological Chemistry *(J BiolChem)* | 4.125 | 2 | -Biochemistry& Molecular Biology | 2 |
| Journal of Oral Pathology & Medicine *(J Oral Pathol Med)* | 2.043 | 2 | -Dentistry, Oral Surgery & Medicine<br>-Pathology | 2 |
| Lancet *(Lancet)* | 47.831 | 1 | -Medicine, General &Internal | 2 |
| Laryngoscope *(Laryngoscope)* | 2.471 | 1 | -Otorhinolaryngology | 2 |
| New England Journal of Medicine *(N Engl J Med)* | 72.406 | 1 | -Medicine, General &Internal | 2 |
| American Journal of Clinical Nutrition*(Am J ClinNutr)* | 6.926 | 1 | -Nutrition&Dietetics | 1 |
| American Journal of Roentgenology*(Am J Roentgenol)* | 2.778 | 2 | -Radiology, Nuclear Medicine & Medical Imaging | 1 |
| Analytical Chemistry (*Anal Chem)* | 6.320 | 1 | -Chemistry, Analytical | 1 |
| Archives of Otolaryngology-Head & Neck Surgery*(Arch Otolaryngol Head Neck Surg)* | n/a* | n/a | n/a | 1 |
| British Journal of Cancer *(Br J Cancer)* | 6.176 | 1 | -Oncology | 1 |
| British Journal of Plastic Surgery[a] *(Br J PlastSurg)* | 2.048 | 2 | -Surgery | 1 |
| CA-A Cancer Journal for Clinicians *(CA-Cancer J Clin)* | 187.040 | 1 | -Oncology | 1 |

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|---|---|---|---|---|
| Cancer and Metastasis Reviews *(Cancer Metastasis Rev)* | 4.697 | 2 | -Oncology | 1 |
| Carcinogenesis *(Carcinogenesis)* | 5.105 | 1 | -Oncology | 1 |
| International Journal of Oral Surgery[b] *(Int J Oral Surg)* | 1.918 | 2 | -Dentistry, Oral Surgery & Medicine<br>-Surgery | 1 |
| Journal of Chronic Diseases and Management *(J Chronic Dis)* | n/a* | n/a | n/a | 1 |
| Journal of Dental Research *(J Dent Res)* | 4.755 | 1 | -Dentistry, Oral Surgery& Medicine | 1 |
| Journal of Investigative Dermatology *(J Invest Dermatol)* | 6.287 | 1 | -Dermatology | 1 |
| Journal of Pathology *(J Pathol)* | 6.894 | 1 | -Oncology<br>-Pathology | 1 |
| Journal of the American Dental Association (JADA) | 2.150 | 2 | -Dentistry, Oral Surgery& Medicine | 1 |
| Mayo ClinicProceedings *(Mayo ClinProc)* | 6.686 | 1 | -Medicine, General &Internal | 1 |
| Mutagenesis *(Mutagenesis)* | 2.507 | 2 | -Toxicology | 1 |
| Nano Letters *(Nano Lett)* | 12.712 | 1 | -Chemistry, Multidisciplinary<br>-Chemistry, Physical<br>-Materials Science, Multidisciplinary<br>-Nanoscience & Nanotechnology<br>-Physics, Applied<br>-Physics, Condensed Matter | 1 |
| Otolaryngology-Head and Neck Surgery *(Otolaryngol Head Neck Surg)* | 2.276 | 1 | -Otorhinolaryngology | 1 |

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|---|---|---|---|---|
| Proceedings of the National Academy of Sciences of the United States of America *(Proc Natl AcadSci USA)* | 9.661 | 1 | -MultidisciplinarySciences | 1 |
| Scandinavian Journal of Dental Research *(Scand J Dent Res)* | n/a * | n/a | n/a | 1 |
| Surgery *(Surgery)* | 3.904 | 1 | -Surgery | 1 |

[a]*British Journal of Plastic Surgery*now called *Journal of Plastic Reconstructive and Aesthetic Surgery*; [b]*International Journal of Oral Surgery* now called *International Journal of Oral and Maxillofacial Surgery*; [c]*Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics*now called *Oral Surgery Oral Medicine Oral Pathology Oral Radiology*; *Not available in the 2016 JCR: Science Edition.

Table 5. Journals in which the 100 most cited articles on oral cancer were published.