Content Analysis of the Top 25 Most Cited Articles of the *Journal of Craniofacial Surgery* With ChatGPT-4o

Yusuf Muhammed Durna, MD, Mustafa Said Tekin, MD,† Yaşar Kemal Duymaz, MD,‡ Ahmet Mahmut Tekin, MD,§‖ and İlhan Bahşi, MD, PhD¶*

Objective: Since 1990, the *Journal of Craniofacial Surgery* has been an important resource for clinicians and basic scientists. The journal addresses clinical practice, surgical innovations, and educational issues. This study aims to evaluate the contribution of these articles to clinical practice innovations and surgical procedures by analyzing the content of the 25 most cited articles published in the journal. It also aims to demonstrate the potential of artificial intelligence tools in academic content analysis.

Methods: All articles published in the *Journal of Craniofacial Surgery* on June 13, 2024, were searched using the Web of Science Database, and the 25 most cited articles were identified. The full texts of these articles were saved in PDF format and metadata were saved as plain text files. Content analysis of these 25 articles was performed using ChatGPT-4o.

Results: As a result of the analysis, some articles stood out in terms of clinical importance. It also appeared that ChatGPT could be used to compare multiple articles.

Conclusion: In this study, the authors analyzed the content of the 25 most cited articles published in the *Journal of Craniofacial Surgery* using ChatGPT-4o. These articles were evaluated according to the criteria of innovations in clinical practice and compliance with surgical procedures. This study presents interesting findings in terms of the use of artificial intelligence tools in academic content analysis. The authors thought that this study could be a source of inspiration for future studies.

From the *Ear Nose and Throat Specialist, Private Practice, Istanbul, Turkey; †Department of Otolaryngology, Medipol Mega Hospital, Medipol University, Istanbul, Turkey; ‡Department of Otolaryngology, University of Health Sciences, Umraniye Training and Research Hospital, Istanbul, Turkey; §Department of Otorhinolaryngology and Head & Neck Surgery, University Hospital UZ Brussel, Vrije Universiteit Brussel, Brussels Health Campus, Brussels, Belgium; ‖Department of Otorhinolaryngology, Klinikum Bad Salzungen, Bad Salzungen, Germany; and ¶Department of Anatomy, Faculty of Medicine, Gaziantep University, Gaziantep, Turkey.

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Address correspondence and reprint requests to İlhan Bahşi, MD, PhD, Department of Anatomy, Faculty of Medicine, Gaziantep University, Gaziantep TR-27310, Türkiye; E-mail: dr.ilhanbahsi@gmail.com

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Launched in 1990, the *Journal of Craniofacial Surgery* is one of the leading journals in its field, appealing to both clinicians and basic scientists from all over the world.[1] The journal addresses clinical applications and current surgical innovations as well as educational topics.[2]

More than 15,000 articles have been published in the *Journal of Craniofacial Surgery*, which has been continuing its publication life for more than 3 decades.[3] Previous studies[4–6] have conducted bibliometric analyses of studies published in *Journal of Craniofacial Surgery*. Although bibliometric analyses provide valuable findings, they do not provide information about the content of the articles.[7]

We believe that content analysis of previously published articles in the *Journal of Craniofacial Surgery*, which has such an important position in the literature, can provide valuable data. On the other hand, it is not possible to analyze the content of such a large number of articles. Therefore, examining the most cited papers in the journal may provide valuable results. In addition to this, we also believe that content analysis with artificial intelligence (AI) tools can provide more objective results than human analysis.

Especially in the last few years, AI tools have gained momentum to revolutionize many fields, especially health and education.[8,9] In addition, AI tools have also become widely used for academic support.[10] ChatGPT, a chatbot recently developed by OpenAI, is one of the most widely used AI tools. It is known that ChatGPT can make very important contributions in education, training, and academic studies.[11] One of these contributions is that it analyzes a large number of articles in a short time.

The aim of this study is to conduct a content analysis of the top 25 most cited articles among the articles published in the *Journal of Craniofacial Surgery* using ChatGPT-4o. It also aims to demonstrate the potential of AI tools in academic content analysis.

METHODS

On June 13, 2024, through the advanced search section of the Web of Science Database, all previously published articles in the *Journal of Craniofacial Surgery* were listed [*Search Field: IS = 1049-2275*], and the top 25 most cited articles were determined (Supplemental Table 1, Supplemental Digital Content 1, http://links.lww.com/SCS/G725). The full texts of these 25 articles were saved in PDF format. In addition, the metadata of these 25 articles were also saved as plain text files via the export tab of

the Web of Science Database. These PDFs and metadata were analyzed for content via ChatGPT-4o on June 15, 2024. ChatGPT-4o was asked to review the content and importance of the articles and then rank these 25 articles according to clinical practice, innovation, and relevance to surgical procedures.

RESULTS

On June 13, 2024; with the advanced search option of Web of Science, it was found that there was a total of 15,074 articles published in the *Journal of Craniofacial Surgery* from 1995 to the present. These articles were ranked according to the number of citations and the top 25 most cited articles were identified (Supplemental Table 1, Supplemental Digital Content 1, http://links.lww.com/SCS/G725).[12–36] The full texts of these 25 articles are saved as PDFs and metadata are saved as plain text files. All PDFs and metadata have been uploaded to ChatGPT-4o. When ChatGPT-4o was asked to evaluate 25 articles in terms of clinical practice, innovation, and relevance to surgical procedures, according to this data, the following answers were received.

Answers Given by ChatGPT-4o

Here's the categorization and ranking of the 25 articles based on their clinical importance, innovation, and relevance to surgical procedures:

Clinical Importance

Reconstruction of large cranial defects using human dental pulp stem cells.[14] This study provides significant clinical implications for craniofacial reconstruction without immunosuppression.

Clinical outcome in cranioplasty: Critical review in long-term follow-up.[24] Offers comprehensive insights into long-term outcomes of various materials used in cranioplasty.

Adipose-derived stromal vascular fraction cells and platelet-rich plasma: basic and clinical evaluation for cell-based therapies in patients with scars on the face.[17] Highlights the effectiveness of using these cells for treating facial scars.

Innovation

Platelet-rich plasma: biology and new technology.[25] Discusses innovative technologies in platelet-rich plasma applications, which could revolutionize treatments in surgical settings.

Autologous fat graft in scar treatment.[18] This paper covers the novel use of autologous fat grafting for scar treatment, providing insights into regenerative medicine techniques.

Tissue-engineered bone repair using autologous bone marrow stromal cells.[29] Provides a novel approach to cranial defect repair using tissue-engineering techniques.

Relevance to Surgical Procedures

Autogenous bone graft: basic science and clinical implications.[28] Essential reading for understanding the use of autogenous bone in various surgical applications.

Precision and accuracy of the 3dMD photogrammetric system in craniomaxillofacial application.[21] Important for surgical planning and postoperative assessment using 3D photogrammetry.

Importance of the critical-size bone defect in testing bone-regenerating materials.[13] Offers insights into the evaluation of bone regenerative materials in craniofacial surgery.

These rankings are based on the details provided in each article concerning their impact on clinical practice, innovative approaches, and specific relevance to surgical methods and procedures.

DISCUSSION

The Journal of Craniofacial Surgery is a very important journal that has been publishing developments and innovations in the field for more than 30 years. Habal[37,38] stated that the *Journal of Craniofacial Surgery* aims to inspire young researchers to pursue the best path for the future and to inform readers of technological innovations that will impact clinical practice. In addition, Liechty et al[39] reported that *Journal of Craniofacial Surgery* appeals to academics from a larger number of countries compared with other journals in this field. Therefore, analyzing the content of the articles in the *Journal of Craniofacial Surgery*, which has been published for more than 30 years and addresses a large number of academics worldwide, will provide important data. However, it is hardly possible to analyze more than 15,000 articles. Therefore, the first 25 most cited articles were analyzed.

AI tools, which have been widely used in the academic field as in many fields in recent years, can be used for content analysis of articles and can examine the importance of articles.[40] In addition, to the best of our knowledge, this is the first study that analyses multiple articles in terms of content and categorizes them according to certain criteria. In addition, we think that the comparison of 25 articles, which are very valuable in their field and have an important place in the literature, with AI tools can be very valuable in terms of understanding the potential of AI tools in the academic field.

Limitations

When we tried to analyze the content of a large number of articles with ChatGPT, we could not get a response, so we were limited to 25 top-cited articles. With technological developments and updates, it will probably be possible to analyze a much larger number of articles at once in the future.

CONCLUSIONS

In this study, we analyzed the content of the 25 most cited articles published in the *Journal of Craniofacial Surgery* using ChatGPT-4o. These articles were evaluated according to the criteria of innovations in clinical practice and compliance with surgical procedures. This study presents interesting findings in terms of the use of AI tools in academic content analysis. We think that this study can be a source of inspiration for future studies.

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During the preparation of this work, the authors used ChatGPT to translate parts of the manuscript. After using this tool/service, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

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