

Keratokonüs Hakkında En Çok Alıntılan 100 Makalenin Altmetrik Analizi

The Altmetric Analysis of the Most Cited 100 Articles About Keratoconus

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ÖZ

Giriş: Çalışmamızda oftalmoloji dergilerinde 2010-2020 yılları arasında yayınlanan keratokonüs ile ilgili en çok atıf alan 100 makalenin hem geleneksel metriklerinin hem de altmetrik puanlarının (AS) değerlendirilmesi amaçlandı.

Yöntem: Web of Science veri tabanında “keratokonüs” kelimesi arandı. Oftalmoloji dergilerinde 2010-2020 yılları arasında yayınlanan makaleler filtrelendi. En çok atıf alan 100 makalenin geleneksel metrik ve altmetrik verileri, makalelerin konusuna, makale türüne, yayın yılına ve yayımlandıkları dergilere göre değerlendirildi. Ayrıca metrik ve altmetrik veriler arasındaki korelasyon da araştırıldı.

Bulgular: AS ile yıllık ortalama atıf ve yayın yılı arasında zayıf bir pozitif korelasyon bulunurken, AS ile yayından bu yana geçen yıl sayısı arasında zayıf bir negatif korelasyon vardı.

Sonuç: AS, geleneksel metrik verilerin yerine kullanılamaz ancak onların tamamlayıcısı olarak düşünülebilir.

Anahtar Kelimeler: altmetrik skor, keratokonüs, sosyal medya, bibliyometrik

ABSTRACT

Objective: The study aimed to evaluate both the traditional metrics and the altmetric scores (AS) of the most cited 100 articles regarding keratoconus published between 2010-2020 in ophthalmology journals.

Method: The word “keratoconus” was searched in the Web of Science database. The articles published in ophthalmology journals between 2010 and 2020 were filtered. The traditional metric and altmetric data of the most cited 100 articles were evaluated according to the subject of the articles, the type of the article, publication year, and the journals they were published in. The correlation between metric and altmetric data was also investigated.

Results: While there was a weak positive correlation between AS and average citation per year and the publication year, there was a weak negative correlation between AS and number of years since publication.

Conclusion: AS cannot be used as a substitute for traditional metric data, but can be considered as a complement to them.

Keywords: altmetric score, keratoconus, social media, bibliometrics

Sending Date: 15.01.2024 **Acceptance Date:** 30.12.2024

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Cite as: Ozer Ozcan Z, Berhuni M, Mete A, Gungor K. The Altmetric Analysis of the Most Cited 100 Articles About Keratoconus. Kocaeli Med J 2024; 13(3): 164-170, doi: 10.5505/ktd.2024.14554

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INTRODUCTION

Keratoconus is a non-inflammatory, progressive disease that can lead to severe vision loss with corneal thinning and astigmatism. (1) Additionally, keratoconus is the most common reason for corneal transplantation in developing countries. (2) This multifactorial disease begins in the 2nd or 3rd decade of life and affects the economically active individuals of society. In a study conducted in the Netherlands, the prevalence of keratoconus was found to be 265 cases per 100,000 individuals. (3) Another study indicated that the prevalence among Asian and Middle Eastern populations is six times higher than in Western European countries. (4) Since keratoconus typically affects young individuals (3), the duration of the condition can be prolonged. Therefore, it is important to recognize that the need for information about keratoconus lasts a lifetime. With the rising prevalence of keratoconus, particularly among young individuals, there has been an increase in information shared through social networks regarding its management. Initially, this diversity of information can be seen as beneficial, as it allows the population to become better informed—especially since varied media content fosters awareness of important public issues (5). Additionally, social media plays a crucial role in how society engages with information; many people rely on it to understand their environment and make decisions (6). However, this proliferation of information may also result in the spread of false or incomplete data, as a significant amount of misleading information and advertisements have been published.

The quality and scientific impact of an article are assessed using various metrics. The most well-known of these are the number of citations and impact factor (IF) of the journal in which the article was published. The IF is the ratio between the number of citations to a journal and all articles published in that journal in the previous two years.(7)

Citations are certainly important in calculating journal metrics. However, a certain period must pass for an article to be cited.(8) These publications are usually read by other researchers, so the usefulness of scientific knowledge is limited to the degree that the knowledge is not communicated to other people. However, scientists have a growing interest in communicating their findings to society [13], and social media is becoming a great way to communicate worldwide. Currently, articles are not only shared in scientific journals but also on many sources (e.g., Twitter, Facebook, blog posts, and news sites). By this way, authors and journals can reach a much wider readership.

Because relying solely on metrics data to evaluate the impact of a scientific publication is insufficient, a web-based measurement method called "altmetrics" was developed in 2010 by Priem. This method assesses the popularity of a publication on the internet and social media platforms. Altmetrics is a valuable tool for identifying publications that attract attention (9) which measures the impact of articles based on the number of mentions across various online sources, allowing for an assessment of a publication's influence in society beyond traditional citations. These new analytical methods enable the public to evaluate the quality of information available on social media, helping individuals distinguish between credible and misleading content. In other words, altmetrics plays a crucial role in combating the spread of misinformation.

Many scientific articles related to the diagnosis, management, and

treatment of keratoconus have been published. Although research in this field is growing, it is essential to understand how the findings are reaching the public. In this context, Altmetric.com tracks online shares and comments to offer critical, real-time insights into the research being produced. This platform provides a new level of visibility into the diverse interactions that occur daily among patients, patient advocates, healthcare professionals, researchers, companies, and other stakeholders. (10)

Altmetrics uses an algorithm that automatically calculates how many times a scientific publication has been shared on which web-based online platform, and makes a score.(11) In just minutes, authors can access Altmetrics data to integrate and display on their platforms or applications. Currently, the Altmetrics database includes citations from over four million research sources. The Altmetric.com algorithm calculates an overall score based on the volume, source, and author of mentions a document receives. This encompasses references to scholarly articles across various social media platforms, including Twitter, Facebook, Pinterest, Google+, science blogs, mainstream media outlets, non-English language publications, special interest publications, and peer review sites.(10) Altmetrics Score (AS) can provide earlier information than traditional metrics in evaluating a publication's impact.

The study aims to evaluate both the traditional metrics and the AS of the most cited 100 articles regarding keratoconus published between 2010 and 2020 according to the publication year, the study subject, the type of scientific study, and the journals in which articles were published and also examined the correlations between traditional metrics and AS.

MATERIALS AND METHODS

Articles were listed by typing "keratoconus" in the search section of the Web of Science Core Collection database. The results were filtered to include articles published in ophthalmology journals between 2010 and 2020 and ranked from the most cited to the least cited. The most cited 100 articles related to keratoconus were included in our study. Inclusion criteria were as follows: articles related to the imaging, diagnosis, and treatment methods, etiology, epidemiology, pathophysiology, follow-up, and prognosis of keratoconus. Only English-language articles were included in the study. Topics not related to the keratoconus were excluded from the study. The type of the study, the topic of the study, the publication year, the number of years since publication (NYsP), the number of citations, the average citations per year (ACpY), and the AS were evaluated. Additionally, the journals in which the articles were published, the journal's IF, 5-year IF, Q category, journal citation indicator (JCI), Eigenfactor score (EFS), article influence score (AIS), immediacy index (II), and h-index were recorded and examined. Ethics committee approval was not required because patient data were not used in our study.

The AS of the articles were obtained by using "Altmetric It!" placed among the bookmarks via "www.altmetric.com". Clicking this bookmark presents both AS and the colored "altmetrics donut" of the article. The altmetrics donut represents how many times a scientific publication has been shared on which web-based online platform. Each source has a different score. (Figure 1)

The h-index of the journals was obtained from scientific journal rankings for 2019 (www.scimagojr.com). All other metrics were obtained from Journal Citation Reports for 2019. (www.jcr.clarivate.com)

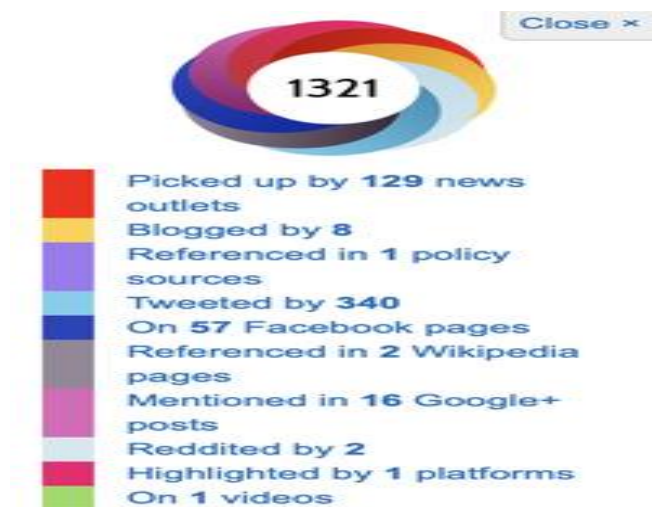


Figure 1. Altmetric donut

Statistical Analysis

All statistical analyses were performed using SPSS 20.0® for Mac (IBM SPSS Statistics for Mac, Version 22.0. Published 2014. IBM Corp., Armonk, NY, USA). The Kolmogorov-Smirnov test was used to understand whether numerical variables were distributed normally and the median and 25% to 75% interquartile range (IQR) were used because the data were not normally distributed. Spearman’s rank correlation analysis was performed to investigate the relationship between AS, citation number, ACPy, published year, NYsP, H index, IF, 5-year IF, JCI, EFS, AIS, and IL. The results of the Spearman correlation test are shown with the r-value. R values between 0.2-0.39, 0.4-0.59, and 0.6-0.79 represented a weak, moderate, and strong relationship, respectively. A value of p < 0.05 was accepted as statistically significant.

RESULTS

According to the Web of Science search, 4693 articles related to the topic of “keratoconus” published between 2010 and 2020 were listed in the ophthalmology category. The number of citations of the most cited 100 articles ranged from 77 to 497. The median citation number of the articles was 105.50 (IQR 86.25–137.00) (Table 1). The most cited article was “Long-term Results of Riboflavin Ultraviolet A Corneal Collagen Cross-linking for Keratoconus in Italy: The Siena Eye Cross Study”, which was published in “American Journal of Ophthalmology” in 2010. The AS of the articles ranged from 0 to 179. The median AS of the articles was 2 (IQR 0–6). “The Association Between Sociodemographic Factors, Common Systemic Diseases, and Keratoconus” had the highest AS (published in “Ophthalmology” in 2016). While 39 articles had no AS yet, 90% of the articles had AS less than 10, included in our study.

When the articles were classified according to publication year, 2012 was the year in which the most articles were published with 21 articles. While 87 of the articles were published between 2010-2015, 13 of them were published between 2016-2020. The citation number and AS median values of the articles according to the publication year were given in Table 2.

Table 1. The Number of Citation and AS Median and Interquartile Range Values of the Articles According to The Article Type

Article type	n	Number of citation	AS
All articles	100	105.50(86.25-137)	2(0-6)
Review	19	98(86-147)	5(1.50-9)
Retrospective comparative study	15	97(85-125)	0(0-2)
Cross-sectional	15	117(94.50-138.50)	0(0-2)
Prospective comparative study	14	89.50(83-100)	0.50(0-4)
Prospective, randomised controlled clinical trial	11	130(115-172)	6(0-4)
Cohort	5	102(81-121)	10(4-11)
Retrospective case series	5	160(131-181)	3(0-6)
Prospective, non randomised clinical trial	4	104(84-309)	7(3.50-10.50)
Prospective case series	3	148(114.50-160)	2(1-4)
Prospective interventional case series	3	89(84.50-107.50)	0(0-1)
Retrospective interventional case series	2	102(93-111)	0.50(0-1)
Comperative case series	2	146(137-155)	0(0-0)
Meta-analysis	1	90 (NA)	9 (NA)
Case reports	1	89 (NA)	0 (NA)

AS:Altmetric Score, NA:Not Applicable
Values are represented as median (25%–75% IQR).

Table 2. The Number of Citation and AS Median and Interquartile Range Values of the Articles According to the Publication Year

Publication Year	n	Number of Citation	AS
2010	16	109.50(92-168)	0(0-5)
2011	19	117(93-135)	3(0-6.50)
2012	21	97(87-131)	2(0-4)
2013	10	112.50(85-122)	3(0-6)
2014	11	85(81-121)	1(0-3)
2015	10	105(85-177)	7(2-11)
2016	7	87(83-116)	3(0.50-7.50)
2017	3	184(165-199)	3(2.50-10)
2018	1	102 (NA)	4 (NA)
2019	1	90 (NA)	9 (NA)
2020	1	109 (NA)	94 (NA)

AS:Altmetric Score, NA:Not Applicable
Values are represented as median (25%–75% IQR).

The articles included in our study were published in 23 different ophthalmology journals. With 14 articles, "Journal of Cataract And Refractive Surgery" was the journal with the most articles. The "Ophthalmology" journal had the highest impact factor. The citation number and AS median values of the articles according to the journals in

which they were published are given in Table 3. When the journals were evaluated in the "Scimago Journal and Country Rank" category, there were 14 in Q1, 7 in Q2, and 2 in Q3. All other metrics data of the journals were given in Table 3.

Table 3. The Number of Citation and AS Median and Interquartile Range Values of the Articles According to the Journals in Which Articles Were Published and Journal Metrics

JOURNAL NAME	N	IF	5-year IF	Q	Journal citation indicator	Normalized eigenfactor score	Immediacy index	Article influence score	H index	Number of citation	AS
JOURNAL OF CATARACT AND REFRACTIVE SURGERY	14	2.689	2.875	Q1	1.09	1.327	.539	.681	148	137(103-172)	3(0-6)
INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE	13	3.470	3.659	Q1	1.57	6.473	.598	1.020	229	98(86-117)	0(0-0)
AMERICAN JOURNAL OF OPHTHALMOLOGY	13	4.013	4.451	Q1	2.06	3.113	1.003	1.417	194	97(81-118)	2(1-6)
JOURNAL OF REFRACTIVE SURGERY	12	2.711	3.125	Q1	1.31	.722	.469	.822	99	121(89-172)	1.50(0-9.50)
CORNEA	11	2.215	2.362	Q1	1.06	1.386	.595	.593	123	102(94-110)	4(3.50-6.50)
OPHTHALMOLOGY	9	8.470	8.339	Q1	3.68	5.535	2.853	2.721	256	131(90-155)	0(0-9)
BRITISH JOURNAL OF OPHTHALMOLOGY	4	3.611	3.402	Q1	1.68	2.476	1.269	1.039	162	117.50 (84.50-131.50)	6.50(2-11)
ACTA OPHTHALMOLOGICA	3	3.362	3.181	Q1	1.23	1.542	.734	.893	93	87(87-111)	3(2.50-3.00)
CLINICAL OPHTHALMOLOGY	3	NA*	NA*	Q1	NA*	NA*	NA*	NA*	63	122(119-135)	5(3.50-5.50)
CLINICAL AND EXPERIMENTAL OPTOMETRY	3	1.918	1.724	Q2	0.71	.326	1.195	.484	59	85 (82.50-92.50)	1(0.50-3.50)
SURVEY OF OPHTHALMOLOGY	2	4.195	4.037	Q1	1.20	.548	1.190	1.209	137	138.50(93-184)	6.50 (2.00-11.00)
EYE	2	2.455	2.732	Q1	1.04	1.305	.785	.788	106	169(161-177)	7.50 (4.00-11.00)
JOURNAL OF OPHTHALMOLOGY	1	1.447	1.784	Q2	0.53	.455	.173	.455	46	85 (NA)	0 (NA)
JAMA OPHTHALMOLOGY	1	6.198	6.109	Q1	2.74	2.712	1.676	2.260	203	89 (NA)	8 (NA)
MOLECULAR VISION	1	2.202	2.392	Q2	0.75	.516	.200	.589	97	83 (NA)	0 (NA)
EXPERIMENTAL EYE RESEARCH	1	3.011	3.135	Q1	1.45	1.452	.732	.831	133	82 (NA)	0 (NA)
CLINICAL AND EXPERIMENTAL OPHTHALMOLOGY	1	2.832	3.092	Q1	1.23	.557	.962	.877	78	78 (NA)	0 (NA)
CONTACT LENS & ANTERIOR EYE	1	2.578	2.364	Q2	1.00	.278	.872	.473	54	339 (NA)	6 (NA)
EYE AND VISION	1	2.241	3.883	Q2	0.89	.224	.359	1.212	29	100 (NA)	7 (NA)
INDIAN JOURNAL OF OPHTHALMOLOGY	1	1.250	1.280	Q3	0.52	.507	.505	.283	59	83 (NA)	25 (NA)
JOURNAL OF CURRENT OPHTHALMOLOGY	1	NA*	NA*	Q2	NA*	NA*	NA*	NA*	NA*	85 (NA)	0 (NA)
OPHTHALMIC EPIDEMIOLOGY	1	1.500	1.703	Q2	0.83	.288	.400	.617	67	117 (NA)	0 (NA)
KLINISCHE MONATSBLATTER FUR AUGENHEILKUNDE	1	.605	.617	Q3	0.30	.133	.234	.123	39	132 (NA)	1 (NA)

IF: Impact Factor, AS: Altmetric Score, NA: Not Applicable
 Values are represented as median (25%–75% IQR).
 *: Journal citation reports do not include metric data for this journal for 2019.

The most common topic was “surgical treatments and follow-up” with 35 articles. The citation number and AS median values of the articles according to topics were given in Table 4. The most common article type was ‘review’ with 19 articles. The citation number and AS median values of the articles according to article type were given in Table 1.

Correlation analysis results between AS, citation number, ACpY, publication year, NYsP, H index, IF, 5-year IF, JCI, EFS, AIS, and II were given in Table 5. While there was a weak positive correlation between AS and ACpY and the publication year, there was a weak negative correlation between AS and NYsP.

Table 4. The number of Citation and AS Median and Interquartile Range Values of the Articles According to the Topic of the Articles

Topic	n	Number of citation	AS
Surgical treatment, follow up,	35	113(88-147)	3(0-9)
Imaging,diagnostic	27	104(91-136)	0(0-2.50)
Pathophysiology	11	117(84-148)	0(0-5)
Surgical treatment	6	91.50(87-93)	2(0-9)
Epidemiologic	5	83(81-117)	5(3-25)
Diagnostic,treatment	4	236(127.50-390)	5.50(4-16)
Prognostic	3	90(87.50-93.50)	1(0.50-5)
Genetics	3	86(84.50-135)	1(0.50-1.50)
Medical treatment	3	93(86.50-00.50)	4(2.50-5.50)
Etiology	2	103.5(98-109)	50(6-94)
Complication	1	95 (NA)	0 (NA)

AS:Altmetric Score, NA:Not Applicable
Values are represented as median (25%–75% IQR).

Table 5. Correlation of Journal Metrics, Altmetric Score and Number of Citations of Articles

	AS	Number of citation	NYsP	ACpY	Publication year	IF	5-year IF	Journal citation indicator	Normalized eigenfactor score	Immediacy Index	Article influence score	H index
AS	1	0.165	-0.274**	0.365**	0.282**	-0.091	-0.111	-0.128	-0.177	0.053	-0.076	-0.163
Citation number	0.102	1	0.123	0.723**	-0.115	-0.017	-0.028	-0.041	-0.085	-0.090	-0.032	0.019
NYSP	0.006	0.225	1	-0.503**	-0.983**	-0.060	-0.058	0.016	0.111	-0.265**	-0.106	0.145
ACYP	<0.001	<0.001	<0.001	1	0.506**	0.048	0.040	-0.021	-0.165	0.115	0.060	-0.097
Published year	0.005	0.254	<0.001	<0.001	1	0.065	0.065	-0.008	-0.107	0.253*	0.111	-0.145
Impact factor	0.375	0.871	0.562	0.642	0.530	1	0.971**	0.958**	0.676**	0.693**	0.970**	0.761
5 year impact factor	0.284	0.784	0.575	0.701	0.531	<0.001	1	0.940**	0.683**	0.623**	0.985**	0.754**
Journal citation indicator	0.213	0.695	0.879	0.841	0.936	<0.001	<0.001	1	0.739**	0.615**	0.937**	0.795**
Normalized eigenfactor score	0.085	0.410	0.283	0.108	0.300	<0.001	<0.001	<0.001	1	0.565**	0.661**	0.894**
Immediacy index	0.606	0.381	0.009	0.265	0.013	<0.001	<0.001	<0.001	<0.001	1	0.665**	0.587**
Article influence score	0.463	0.760	0.304	0.562	0.282	<0.001	<0.001	<0.001	<0.001	<0.001	1	0.730**
H index	0.106	0.850	0.150	0.335	0.149	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	1

The values above the diagonal consisting of the number "1" extending from the top left to the bottom right represent the "r" value, and the values below represent the "P" value.
*Correlation is significant at the 0.05 level, **Correlation is significant at the 0.01 level
AS:Altmetric score, IF:Impact factor, NYsP: number of years since publication, ACpY:Average citation per year

DISCUSSION

This study evaluated both the traditional metrics and AS of the most cited 100 articles regarding keratoconus published between 2010 and 2020 in ophthalmology journals according to publication year, the study subject, the type of scientific study, and the journals in which articles were published. We also examined the correlations between traditional metrics and AS.

The number of citations and the metrics data of the journals that have published articles are undoubtedly important criteria that show the effectiveness and quality of an article in the scientific community. (12) However, a certain amount of time must have passed after the publication time for citation. (13) In addition, many journals limit the number of references in their publication criteria. Another limitation is that readers who appreciate an article may not cite it unless they are writing a new article. As a result, the AS, which quickly and practically shows the interaction of a published article, has become popular in recent years. Currently, the Internet has become an important professional information-sharing platform for the medical community. Medical doctors follow the social media accounts of leading experts in their fields of interest, benefit from their informative posts, and follow their surgical techniques. YouTube seems to have become a popular source for transferring surgical techniques among surgeons. (14) Therefore, the internet and social media platforms have become beneficial for sharing scientific publications. (15) As soon as an article is published, it can be shared on various platforms on the internet by reaching relevant health professionals whether they are interested in writing an article or not. The above-mentioned process facilitates increasing the visibility of the publication and the journal. A neurosurgical study found that articles published in journals that have social media accounts have higher ASs compared with articles that do not. (16) For this reason, AS has become a data that has started to be accepted in the scientific community today. Even high-impact journals began giving altmetrics and metrics data together on their pages.

The present study showed that the majority of the articles related to keratoconus were published on “surgical treatment and follow-up” and “imaging and diagnosis”, respectively. Keratoconus is a progressive disease with a better visual prognosis if detected early and managed correctly. Therefore there is a growing number of developments in the diagnosis and treatment of the disease and also there is a growing number of articles focusing on this subject. (17) However, the ASs of the articles which were included in our study were not high. Technical issues may be less interesting because the AS measures interaction on online social platforms. (11,15) The three articles with the highest AS in our study were “The Association Between Sociodemographic Factors, Common Systemic Diseases, and Keratoconus” (AS:179, Ophthalmology), “The Prevalence and Risk Factors for Keratoconus: A Systematic Review and Meta-Analysis” (AS:94, Cornea), “Global Consensus on Keratoconus and Ectatic Diseases” (AS:26, Cornea). The relatively high altmetrics score of these articles may be because they are far from technical details that more people can understand and are interested in due to their subject matter. On the other hand, the AS of the article with the highest number of citations in our study was 10. (Long-term Results of Riboflavin Ultraviolet A Corneal Collagen Cross-linking for Keratoconus in Italy: The Siena Eye Cross Study). In addition, the AS of articles related to a popular or

epidemic disease in a specific period may be higher. A study in which altmetrics analysis of the articles related to the retina found that while the AS of an article on the ophthalmic effects of the Zika virus was 1340, the AS of the most cited article on retinal imaging was 17. (15) A recent study showed that AS of 100 articles related to COVID-19 is 3246 ± 3795 (85-16548). (18) Another study evaluating the altmetrics activity of 12.3 million Web of Science publications presented that infectious diseases draw more attention with a more social impact than other types of diseases. (19)

In this study, while 87 of the articles were published between 2010 and 2015, 13 of them were published between 2016 and 2020. This was an expected result because the number of citations increases as time elapses after the publication of the article. Since we built our study on the most cited 100 articles, the majority of the included studies were before 2016. On the other hand, the use of social media increased recently (20) therefore 90% of the articles had AS less than 10 in our study. 39 of them did not yet have an AS. The focus on only ophthalmology journals might also contribute to the lower AS observed in this study. A study related to emergency medicine demonstrated that the articles published in general medical journals have higher AS compared to those in emergency medicine journals. (21)

Most of the 100 articles included in our research were conducted using the “review” method. It was not surprising that most of the most cited 100 articles were “reviews” related to their high levels of evidence.

In this study, there was no correlation between AS and the number of citations and a weak correlation with the ACpY. Two studies including articles that were published in general medical journals have demonstrated a positive correlation between AS and the number of citations. (11,21) One possible explanation for this finding is that articles published in general medical journals reach a broader population, thereby achieving higher AS. (21) Similar to our findings, two other studies which were conducted in ophthalmology, and orthodontic journals found no relationship between the AS and the number of citations. (15,22)

A weak negative correlation was found between AS and NYsP in our study. This was an expected result when considering the widespread use of the internet and social media over time. No significant correlation was found between AS and any of the metric data of the journals in which the study was published. This finding showed that the scientific community's interest and general internet users could be in different directions. Given the increasing Internet and social media use, the relationship between AS and traditional metric data may increase over time.

The limitations of this study are the inclusion of only English-language articles published in ophthalmology journals and the presence of a time filter. We didn't check whether the journals had social media accounts. This situation may have an impact on the altmetrics scores. Additionally, the sources of the altmetrics score have not been determined in this study. To the best of our knowledge, the study is the first to examine and compare traditional metrics and AS on keratoconus in the English literature.

CONCLUSION

Altmetrics Score cannot be used as a substitute for traditional metric data, but may be considered as a supplement to them. The widespread use

of the internet and social media has increased the importance of the concept of altmetrics and we predict that the relationship between AS and traditional metric data will increase over time. The active use of social media by journals and authors may increase the visibility of articles and enable them to reach more people..

Ethics Committee Approval: Ethics committee approval was not required because patient data were not used in our study.

Author Contributions: All authors contributed to all stages of the article and read and approved the final version.

Conflict of Interest: There is no conflict of interest in our study to declare. There is no institutional and financial support.

Funding: There is no institutional and financial support.

Informed Consent: Patient consent was not obtained because it was a retrospective study.

REFERENCES

- Godefrooij DA, de Wit GA, Uiterwaal CS, Imhof SM, Wisse RP. Age-specific Incidence and Prevalence of Keratoconus: A Nationwide Registration Study. *Am J Ophthalmol.* 2017 Mar;175:169-172.
- Gordon-Shaag A, Millodot M, Shneur E, Liu Y. The genetic and environmental factors for keratoconus. *Biomed Res Int.* 2015;2015:795738.
- Godefrooij DA, De Wit GA, Uiterwaal CS, Imhof SM, Wisse RP. Age-specific incidence and prevalence of keratoconus: a nationwide registration study. *American journal of ophthalmology.* 2017;175:169-172.
- Georgiou T, Funnell C, Cassels-Brown A, O'conor R. Influence of ethnic origin on the incidence of keratoconus and associated atopic disease in Asians and white patients. *Eye.* 2004;18(4):379-383.
- Barabas J, Jerit J. Estimating the causal effects of media coverage on policy-specific knowledge. *American Journal of Political Science.* 2009;53(1):73-89.
- Longstaff PH. Security, resilience, and communication in unpredictable environments such as terrorism, natural disasters, and complex technology. *Center for Information Policy Research, Harvard University.* 2005;3:1-7.
- Kumar A. Is "Impact" the "Factor" that matters...? (Part I). *J Indian Soc Periodontol.* 2018;22(2):95-96.
- Çelik E, Dokur M, Borku Uysal B, Şengül Samancı N, Demirelli FH. Comparison of attention for cancer research on social media versus academia: an altmetric score analysis. *International Journal of Hematology and Oncology* 2020;30(1):32-42
- Chavda J, Patel A. Measuring research impact: bibliometrics, social media, altmetrics, and the BJGP. *British Journal of General Practice.* 2016;66(642):e59-e61.
- Alvarez-Peregrina C, Villa-Collar C, Martinez-Perez C, Barbosa MIP, Sánchez-Tena MÁ. Social media impact of myopia research. *International Journal of Environmental Research and Public Health.* 2022;19(12):7270.
- Bulut E, Celebi ARC, Dokur M, Dayi O. Analysis of trending topics in glaucoma articles from an altmetric perspective. *International Ophthalmology.* 2021;41(6):2125-2137.
- Durieux V, Gevenois PA. Bibliometric indicators: quality measurements of scientific publication. *Radiology.* 2010;255(2):342-351.
- Sud P, Thelwall M. Evaluating altmetrics. *Scientometrics.* 2014;98(2):1131-1143.
- McKee HD, Jhanji V. Learning DMEK From YouTube. *Cornea.* 2017;36(12):1477-1479.
- Sener H, Polat OA. Altmetric Analysis Of The Most-Cited 100 Articles On The Retina Published Between 2010 And 2020. *Retina.* 2022;42(2):283-289.
- Wang J, Alotaibi NM, Ibrahim GM, Kulkarni AV, Lozano AM. The Spectrum of Altmetrics in Neurosurgery: The Top 100 "Trending" Articles in Neurosurgical Journals. *World Neurosurg.* 2017;103:883-895.e1.
- Hashemi H, Heydari S, Hooshmand E, et al. The Prevalence and Risk Factors for Keratoconus: A Systematic Review and Meta-Analysis. *Cornea.* 2020;39(2):263-270.
- Borku Uysal B, Islamoglu MS, Koc S, Karadag M, Dokur M. Most notable 100 articles of COVID-19: an Altmetric study based on bibliometric analysis. *Ir J Med Sci.* 2021;190(4):1335-1341.
- Fang Z, Costas R, Tian W, Wang X, Wouters P. An extensive analysis of the presence of altmetric data for Web of Science publications across subject fields and research topics. *Scientometrics.* 2020;124(3):2519-2549.
- Perrin A. Social media usage. *Pew research center.* 2015;125:52-68.
- Barbic D, Tubman M, Lam H, Barbic S. An Analysis of Altmetrics in Emergency Medicine. *Acad Emerg Med.* 2016;23(3):251-268.
- Livas C, Delli K. Looking Beyond Traditional Metrics in Orthodontics: An Altmetric Study on the Most Discussed Articles on the Web. *Eur J Orthod.* 2018;40(2):193-199.