THE ATLANTIC Journal of Medical Science and Research

Atlantic J Med Sci Res 2026;6(2):158-64
DOI: 10.5455/atjmed.2025.12.052

Original Article

Ayza Kilic[1], Rezan Kocak Ulucakoy[2]

[1]Anamur State Hospital, Department of Physical and Rehabilitation Medicine, Mersin, Türkiye
[2]Gazi University, Faculty of Medicine, Department of Physical and Rehabilitation Medicine, Division of Rheumatology, Ankara, Türkiye

Received: 14 January, 2026
Accepted: 15 March, 2026
Published: 02 April, 2026

Corresponding Author: Ayza Kilic, Anamur State Hospital, Department of Physical and Rehabilitation Medicine, Mersin, Türkiye
Email: dr.ayza.mamedova@gmail.com

CITATION
Kilic A, Ulucakoy R. A cross-sectional study of the relationship between altmetric attention scores and impact factor in top-quartile (Q1) rheumatology journals. Atlantic J Med Sci Res. 2026;6(2):158-64. DOI: 10.5455/atjmed.2025.12.052

A cross-sectional study of the relationship between altmetric attention scores and impact factor in top-quartile (Q1) rheumatology journals

Abstract

Aim: The objective of this study is to evaluate the relationship between the journal-level altmetric attention score (AAS) and bibliometric measures (journal impact factor (JIF) and citation count) in high-ranking rheumatology journals (Q1- first quartile).
Materials and Methods: The 15 Q1 rheumatology journals were identified via Web of Science Journal Citation Reports (JCR). For each journal, the 2023 JIF and the 50 articles contributing most to it were analysed. Citation counts (2021-2023) and AAS for these articles were recorded. Data on the journals' X (Twitter) presence (accounts, followers, posts, interactions in 2023) was also collected.
Results: Moderate positive correlations were found between the journal's AAS and its JCR citation count, total citation count, and 2023 citation count (r=0.528, r=0.560, r=0.531 respectively; $p<0.001$ for all).
Conclusion: The significant relationships between altmetrics and traditional bibliometrics, suggest the AAS reflects not just online engagement, but also underlying scientific activity. This highlights digital visibility's role in science, the growing relevance of social media in academia, and the potential of altmetrics as a complementary measure of academic impact.

Keywords: Altmetrics, bibliometrics, citations, journal, rheumatology, social media, impact factor

INTRODUCTION

The proliferation of internet access and the evolution of social media platforms have significantly facilitated global information dissemination. While offering substantial advantages—such as enabling real-time access to scientific updates, fostering direct communication among researchers, and stimulating scholarly discourse—these developments also introduce critical challenges. Foremost among these are information pollution and the misrepresentation of medical knowledge by non-experts, underscoring the need for reliable sources. In this context, official social media accounts of scientific journals serve as credible conduits for distributing validated information to both academic communities and the public, enhancing engagement in scientific discourse (1,2). Two fundamental metrics are employed to gauge the prestige and academic influence of scientific journals: the journal impact factor (JIF) and the quartile value (Q value). The JIF, a proprietary bibliometric metric curated by Clarivate Analytics, quantifies the mean citation frequency per citable item published in a journal over a two-year window. Specifically, it

represents the ratio of citations received in the current year to articles published in the preceding two years, divided by the total number of citable items (e.g., research articles, reviews) published in that journal during the same biennial period. Consequently, an elevated count of citations per article serves to augment the journal's impact factor. The Q value signifies the quartile within which a journal is positioned in relation to other journals within its field. Q1 value is indicative of a journal's position within the top 25% of journals in its category with the highest impact factor (3).

The increasing interaction of academic journals on social media has given rise to novel alternative metrics. One such alternative metric is altmetrics, which aims to measure the attention a publication has received in the digital environment. Altmetric Attention Score (AAS) quantifies the interactions a scholarly article receives on social media platforms such as X (previously known as Twitter), Facebook, news sites, blogs, and Wikipedia, employing a proprietary scoring system (4-6). In contrast to conventional citation-based measures, AAS captures real-time, publicly accessible engagement, tracking the frequency and context in which a paper is discussed in digital media. Among the platforms serving this purpose, X is at the forefront as of 2023 (7). X, formerly known as Twitter, was founded in 2006 and is a social media platform focused on sharing short text-based content. In recent years, AAS have been investigated across various medical disciplines, including rheumatology (8-12). However, no studies have specifically assessed journal-based AAS within the field, thus leaving a gap for a more holistic assessment. This study, as the first to adopt a journal-level perspective, aims to explore the relationship between alternative bibliometric indicators of Q1 rheumatology journals, JIF, and citation counts, under the assumption that researchers and clinicians in this field actively engage with social media (13). A secondary objective is to conduct a separate evaluation of X, which accounts for the largest proportion of AAS.

MATERIALS AND METHODS

The study encompassed journals classified within the rheumatology category and assigned to the Q1 quartile by the Web of Science Journal Citation Reports (JCR) database. This restriction to Q1 journals was implemented specifically to control for high-impact bias. Consistent with methodologies in analogous research, we recorded for each journal: the 2023 JIF, country of origin, year of establishment, and the total citations of the top 50 articles contributing to its 2023 JIF (14). Total citation counts in the subsequent 3 years (i.e., 2021–2023) were retrieved by searching Web-of-Science for the corresponding article. Furthermore, the 2023 citation counts and the AAS for the articles mentioned above were obtained from Altmetric badges with public, free basic access. In addition, the number of X posts related to the 50 articles selected based on AAS was also recorded. Official X accounts of the journals were identified through systematic searches of journal websites and the X platform. For each account, the following metrics were manually extracted and recorded: year of account creation, follower count, following count, total posts, and 2023 specific engagement data (posts, likes, comments, reposts, views). Only original content was included; sponsored posts and advertisements were deliberately excluded from the analysis.

This study did not entail human subjects research and thus did not require institutional ethics committee approval.

The obtained data were then subjected to analysis using IBM SPSS Statistics version 27.0 (IBM Corp., Armonk, NY, USA). The conformity of the numerical data to normal distribution was assessed by both visual (Histogram and Detrended Q-Q charts) and analytical (Shapiro-Wilk or Kolmogorov-Smirnov tests) methods. Non-normally distributed numerical data were presented as median. Given the absence of a normal distribution in the data, statistical evaluation was conducted via Spearman correlation analysis. To facilitate data visualization, log-log scaled distribution graphs were created to assess the relationship between the count of X posts and the AAS and the n count of citations. A simple linear regression analysis was applied to obtain the regression curve (trend line). Since multiple correlation analyses were performed, A p-value<0.05 was considered statistically significant.

RESULTS

Among the 57 journals classified within the rheumatology category in the JCR database, 15 journals in the Q1 quartile were selected for inclusion in the study (Table 1).

A moderate positive correlation was identified between the JCR citation count, total citation count, and 2023 citation count of 15 journals entering the Q1 quartile of rheumatology and AAS ($r=0.528$, $r=0.560$, and $r=0.531$; $p<0.001$ for all respectively). A significant positive correlation was identified between the count of posts on X and AAS ($r=0.805$; $p<0.001$). A comprehensive analysis of all Q1 journals, irrespective of X account ownership, revealed no significant correlation between JIF and AAS. However, subsequent correlation analysis restricted to journals with dedicated X accounts demonstrated a strong positive correlation between JIF and AAS. ($r=0.470$, $p=0.080$; $r=0.730$, $p=0.001$, respectively) (Table 2).

While 10 of the 15 journals had official X accounts, 5 were found to be present on X through general publisher accounts. Despite the existence of an X account in one journal, it was determined that no posts had been made in 2023. Therefore, a total of nine journals were incorporated into the correlation analysis for X data, as illustrated in Table 3.

Table 4 shows the correlations between X-metrics and both JIF and total citation count. The X-metrics exhibiting significant correlations with both JIF and total citation count were follower count, total count of posts, post, repost and count of views (2023).

Figure 1 depicts the relationship between social media activity and citation count through a log–log scatter plot. The analysis revealed that the correlation between total X post count and citation count was statistically stronger than the correlation between AAS and citation count.

Table 1. Traditional and alternative bibliometric measures of first quarter (Q1) journals in the rheumatology category on Web of Science

Journal	2023 JIF	Year of first publication	Country	JCR citation count *	AAS
Nature Reviews Rheumatology	29.4	2005	USA	2185	36 (8-488)
Annals of the Rheumatic Diseases	20.3	1935	England	2855	73.5 (1-772)
Lancet Rheumatology	15	2019	England	996	52.5 (8-802)
Arthritis and Rheumatology	11.4	2014	USA	1899	48 (1-888)
Osteoarthritis and Cartilage	7.2	1993	England	1047	8 (1-250)
RMD Open	5.1	2015	England	707	26 (1-664)
Rheumatology	4.7	1999	England	982	13 (1-3595)
Best Practice and Research in Clinical Rheumatology	4.5	1975	England	325	9 (1-114)
Current Opinion in Rheumatology	5.2	1989	USA	552	4 (1-295)
Current Rheumatology Reports	5.7	1999	USA	514	4.5 (1-262)
Seminars in Arthritis and Rheumatism	4.6	1971	USA	705	11 (1-133)
Arthritis Research and Therapy	4.4	2003	England	704	5 (1-249)
Arthritis Care and Research	3.7	1988	USA	705	22 (1-158)
Joint Bone Spine	3.8	2000	France	388	7 (1-175)
Lupus Science and Medicine	3.7	2014	England	402	10 (1-187)

*Total count of citations from the top 50 most influential articles in JIF. JIF: Journal impact factor, AAS: Altmetric attention score, min: minimum, max: maximum

Table 2. Correlation analysis between AAS and other parameters

Variables	AAS*		
	r	*p*	*CI*
JCR citation count	0.528	<0.001	0.467-0.581
Total citation count	0.560	<0.001	0.504-0.611
2023 citation count	0.531	<0.001	0.471-0.585
The count of posts on X[a]	0.805	<0.001	0.767-0.836
2023 JIF (with X account)	0.733	0.016	0.160-1.000
2023 JIF (all Journals)	0.470	0.080	-0.25-0.740

*Correlation analysis Spearman test. r: correlation coefficient, p: significance level, CI: Confidence Interval, AAS: altmetric attention score, JCR: journal citation reports, JIF: journal impact factor, [a]Number of posts made on X regarding articles that impact JIF

Table 3. X data of the first quarter (Q1) journals in the rheumatology category indexed in Web of Science

Journal	Official X account	Follower count	Total post count	Year of joining X platform	Following count	Post in 2023	Comment 2023	Reposts 2023	Likes 2023	Views 2023
Nature Reviews Rheumatology	@NatRevRheumatol	18300	6739	2011	434	283	68	3338	7107	706643
Annals of the Rheumatic Diseases	@eular_ARD	12800	5766	2010	235	323	71	3604	7048	1294816
Lancet Rheumatology	@TheLancetRheum	14300	2935	2019	284	346	356	3334	7431	2850762
Osteoarthritis and Cartilage	@OACJournal	4193	2028	2018	270	338	151	1634	4860	674530
RMD Open	@bmj_rmdopen	529	297	2024	97	0	0	0	0	0
Rheumatology	@RheumJnl	12100	4542	2015	1801	437	200	1802	4789	911139
Best Practice and Research in Clinical Rheumatology	@best_rheum	297	740	2021	128	267	259	2128	5448	6186
Seminars in Arthritis and Rheumatism	@seminarthrheum	4295	824	2020	59	267	259	2128	5448	6186
Arthritis Research and Therapy	@ArthritisRes	3512	854	2011	1266	1	0	7	4	467
Lupus Science and Medicine	@Lupus_SM	2036	1747	2014	110	128	14	551	441	189580

The value “0” for RMD Open denotes unavailable data (account opened in 2024), whereas the “0” values for Arthritis Research and Therapy reflect genuine zero interactions in 2023

Atlantic J Med Sci Res 2026;6(2):158-64
DOI: 10.5455/atjmed.2025.12.052

Table 4. Correlation of X data with JIF and citation counts

Variables	2023 JIF			Total citation count		
	r	*p*	*CI*	*r*	*p*	*CI*
Follower count	0.883	0.002	0.526-1.000	0.833	0.005	0.263-1.000
Total post count	0.800	0.010	0.211-1.000	0.850	0.004	0.296-0.964
Post in 2023	0.661	0.053	-0.155-0.946	0.594	0.092	-0.321-0.848
Repost in 2023	0.812	0.008	0.123-0.973	0.628	0.070	-0.125-0.982
Views in 2023	0.745	0.021	0.254-0.977	0.711	0.032	0.232-0.952

*Correlation analysis Spearman test. r: correlation coefficient, p: significance level, CI: Confidence interval, AAS: altmetric attention score, JCR: journal citation reports, JIF: journal impact factor, [a] Number of posts made on X regarding articles that impact JIF

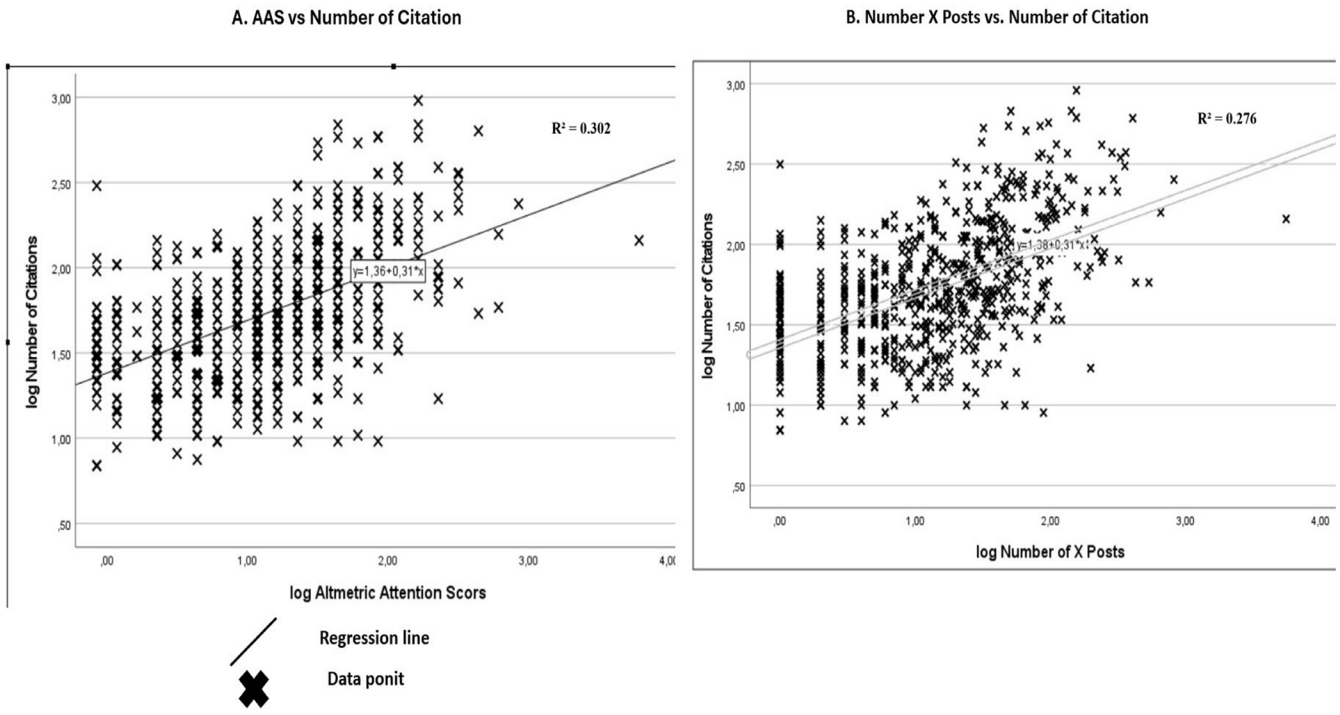

Figure 1. Relationship between social media activity and number of citations (Log-log scale with regression lines, N=15 journals, 750 articles).
This figure presents two log–log scatter plots examining the association between social media metrics and citation count. A) Altmetric Attention Score (AAS) also shows a positive relationship with citations, though the correlation appears weaker compared to X post count. B) The count of X posts is positively associated with citation count

DISCUSSION

In addition to conventional bibliometric metrics, the visibility of scientific publications on social media platforms has also been evaluated as part of scientific impact in the digital age. Research has been conducted on the social media interaction of scientific journals in the field of medicine(14-25). To the best of our knowledge, this is the first study to evaluate the relationship between alternative metrics of top rheumatology journals and the journal's impact factor and citation count. A high correlation was identified between AAS and JIF, and a moderate correlation was identified between JCR citation count, total citation count, and citation count for 2023. In a study examining the relationship between AAS and citation counts in 15 gynecological journals, the authors found a

high positive correlation between AAS and JIF, similar to the findings of our study (20). A parallel investigation, undertaken with the aid of pediatric surgery journals, yielded a modest positive correlation between citation counts and AAS (21). This discrepancy may be attributed to the temporal difference between the data collection for this study and the current period, as the study was conducted with data from 2012 to 2015, whereas social media usage has seen significant growth since that time. In the correlation analysis conducted with all journals included in the study, a relationship between AAS and JIF could not be detected initially. Therefore, when the analysis was limited to journals with dedicated X accounts, a strong positive correlation was observed, indicating that engagement on X is closely linked to higher AAS in rheumatology journals. A parallel investigation, conducted in collaboration with radiology journals, yielded analogous findings, with X shares being identified as the platform exerting the most significant influence on AAS, a conclusion that aligns with the results of our study (22). X's academic user base may explain the significant role this platform plays in AAS. A high level of positive correlation was identified between the JIF and certain interaction indicators of X accounts. A parallel investigation, conducted with stroke journals in the domain of neurology, identified a linear correlation between the count of citations and X posts, as well as between the count of citations and AAS, findings that align with our study (14). Another study, which was conducted with general surgery journals, found a high correlation between JIF and X posts and between followers, similar to the findings of our study (23). Our research revealed that prominent rheumatology journals are actively utilizing the X platform. A total of 10 out of 15 journals have established their own accounts on X, while five are actively engaged on the platform, even under the aegis of a general publisher. A 2023 study in the field of neurology found that 60% of stroke journals had an X account (14). while a 2019 study of plastic surgery journals found that only 50% of the included journals had an X account (18). This finding suggests a general trend of increasing social media usage over time. In the scientific community, X is employed as a medium for the dissemination of current research findings and the facilitation of scientific discourse. In particular, the official X accounts of academic journals can increase the visibility of the articles they publish, thereby increasing the likelihood of these publications being read and cited. A parallel investigation of cardiovascular literature revealed a positive correlation between heightened X promotion and increased citations (24). This study has several important limitations. First, the exclusive focus on Q1 journals limits the generalizability of the findings to journals in lower quartiles, which may exhibit different patterns of social media engagement and citation dynamics. Second, the cross-sectional design precludes the assessment of long-term trends or causal relationships between social media visibility and bibliometric impact. Third, factors inherent to the journals themselves, such as their age and established audience reach, could influence follower counts and subsequent citation rates independently of social media activity, but were not comprehensively controlled for. Fourth, the inherent variability and potential susceptibility to manipulation of social media algorithms pose a significant challenge. While increased visibility on social media can enhance citation counts and accelerate dissemination, algorithmic manipulation can artificially promote articles based on desired headlines or advertisements, potentially biasing metrics like the AAS (25). Consequently, the AAS requires cautious interpretation. For these reasons, it should not be extrapolated the findings of this study to the long term. Nevertheless, this study has several strengths. First, to our knowledge, this is the first study to specifically examine the relationship between alternative metrics and traditional bibliometric indicators in leading rheumatology journals, thereby filling an important gap in the literature. Second, the data were obtained from publicly available and standardized sources, which increases the transparency and reproducibility of the findings. Third, the AAS, JIF, citation counts, and interaction metrics from the X platform were evaluated simultaneously, enabling a more comprehensive assessment than a limited analysis based on a single metric. Finally, this study highlights the potential connection between social media, particularly X interactions, and scientific visibility and impact metrics in rheumatology.

In the future, observational studies examining more detailed alternative metrics with a focus on rheumatology journals can be conducted to determine the effect of social media visibility on the count of citations. Furthermore, studies can be designed to longitudinally assess the impact of social media interaction on changes in JIF and quartile indices. Consequently, studies can be conducted to evaluate the accuracy of information disseminated under the rubric of rheumatology on social media accounts. The implementation of comparative studies across various medical disciplines has the potential to elucidate interdisciplinary discrepancies. A potential avenue for further investigation would be to examine components influencing AAS separately, with the objective of identifying interaction sources. Furthermore, more comprehensive analyses could be conducted by considering ethical and structural factors such as social media manipulation, algorithmic promotion, and citation quality.

CONCLUSION

The existence of substantial relationships between alternative metrics and conventional bibliometric measures, such as the JIF and citation counts, suggests the capacity of the AAS to potentially reflect not only interaction but also scientific activity. This phenomenon highlights the possible role of digital visibility in scientific processes, indicates the growing relevance of social media in academic communication, and points to the potential usefulness of altmetrics as a complementary metric of academic impact. Publishers may consider incorporating altmetrics into impact dashboards.

Conflict of Interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that there is no financial support.

Ethical Approval
This study did not entail human subjects research and thus did not require institutional ethics committee approval.

Patient Consent
Not necessary for this manuscript.

REFERENCES

1. Mehrazar M, Kling CC, Lemke S, et al. Can we count on social media metrics? First insights into the active scholarly use of social media. In: Proceedings of the 10th ACM Conference on Web Science. 2018;215-9.
2. Ng JY, Stephen D, Liu J, et al. Bibliometrics and altmetrics in the context of traditional, complementary, and integrative medicine. Integr Med Res. 2025;101181.
3. Asan A, Aslan A. Quartile scores of scientific journals: Meaning, importance and usage. Acta Med Alanya. 2020;4:102-8.
4. Mullins CH, Boyd CJ, Ladowski JM. The association between altmetric attention scores and public engagement in the medical literature. J Surg Res. 2023;292:324-9.
5. Elmore SA. The altmetric attention score: what does it mean and why should I care? Toxicol Pathol. 2018;46:252-5.
6. Studenic P, Ospelt C. Do you tweet?: trailing the connection between Altmetric and research impact! RMD Open. 2020;6:e001034.
7. Mac R, Hsu T. From Twitter to X: Elon Musk begins erasing an iconic internet brand. New York Times. 2023;24:2023.
8. Zimba O, Korkosz M, Alnaimat F, et al. Global practice guidelines in rheumatology: a cross-sectional altmetric and citation analysis. Rheumatol Int. 2025;45:150.
9. Chen WM, Bukhari M, Cockshull F, et al. The relationship between citations, downloads and alternative metrics in rheumatology publications. Rheumatology. 2020;59:277-80.
10. Li M, Yin F, He Y, et al. Bibliometric and altmetric analyses of publication activity in idiopathic inflammatory myopathy. Rheumatol Int. 2023;43:1121-33.
11. He Y, Li M, Yu H, et al. Bibliometric and altmetric analysis of research relating to antiphospholipid syndrome. Clin Rheumatol. 2023;42:1285-95.
12. Xie X, Yu H, He Y, et al. Bibliometric analysis of systemic lupus erythematosus literature. Clin Rheumatol. 2024;43:175-87.
13. Nikiphorou E, Studenic P, Ammitzbøll CG, et al. Social media use among young rheumatologists and scientists. Ann Rheum Dis. 2017;76:712-5.
14. Sousa JA, Alves IA, Donato H, et al. The Twitter factor: impact on stroke journals and citation rates. Int J Stroke. 2023;18:586-9.
15. Kim D, Jung W, Jiang T, et al. Medical journals' Twitter use: exploratory study. J Med Internet Res. 2023;25:e43521.
16. Kelly BS, Redmond CE, Nason GJ, et al. Twitter use by radiology journals and impact factor. J Am Coll Radiol. 2016;13:1391-6.
17. Jeong J, Kim M, Oh HK, et al. Social media impact on citation rates in coloproctology. Colorectal Dis. 2019;21:1175-82.
18. Asyyed Z, McGuire C, Samargandi O, et al. Twitter use by plastic surgery journals. Plast Reconstr Surg. 2019;143:1092e-8e.
19. Koh A, Lewis-Lloyd CA, Wong T, et al. Correlation between Altmetric Attention Scores and citation scores. Br J Anaesth. 2025;134:703-12.
20. Chi AJ, Lopes AJ, Rong LQ, et al. Altmetric Attention Score and citation count in gynecologic oncology. Gynecol Oncol Rep. 2021;37:100778.
21. Chang J, Desai N, Gosain A. Correlation between altmetric score and citations in pediatric surgery. J Surg Res. 2019;243:52-8.
22. Rosenkrantz AB, Ayoola A, Singh K, et al. Alternative metrics for assessing article impact in radiology. Acad Radiol. 2017;24:891-7.
23. Ertenlice A. Social media interaction in general surgery publications. Arch Curr Med Res. 2024;5:21-7.
24. Ladeiras-Lopes R, Vidal-Perez R, Santos-Ferreira D, et al. Twitter promotion and citation rates. Eur Heart J. 2022;43:1794-8.
25. Smartz TM, Jabori SK, Djulbegovic MB, et al. Altmetric Scores and citation count in plastic surgery journals. Aesthet Surg J. 2023;43:NP943-8.