ORIGINAL ARTICLE

Social media interaction of publications in the field of general surgery: A comparative analysis of the twitter performances of Q1 medical journals with their impact factor

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Abstract

Background: It is a well-known fact that social media has the power to reach a great number of audiences through robust information, interaction, and communication. Twitter is also known to be one of the strongest social media tools, which is especially known for its high volume of information sharing. In this study it is aimed to analyse the relationship between the impact factor (IF) of Quartiles1(Q1) journals in the field of General Surgery and their performances on Twitter.

Method: Surgical Q1 journals have been listed. While creating the list, journals without a Twitter account have been excluded from the study. The IF of the journals has been compared with their total shares, comments, likes, retweets, total views, followers, and total shares for all time between June 1st, 2023, and November 30th, 2023.

Results: Results indicated moderate positive correlations between IF and engagement metrics like shares, comments, likes, and retweets, with follower count and total shares showing stronger statistically significant correlation.

Conclusion: No comparative relationship or correlation is found between the parameters of the last six months and the IF. Only, a correlation has been observed with the total number of views within the last six months. A correlation is noted between the number of followers and the total number of shares for all time. These results are attributed to the fact that journals with a high IF are established and respected and lead to these outcomes even if they share at similar rates as other journals.

Keywords: General Surgery, social media, Impact Factor, Twitter.

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INTRODUCTION

Today, the effect of academic publications has been evaluated and discussed not only by the scientific community but also by the wider public. An important platform that attracts the attention of these broader audiences is social media. Specifically, for the dissemination of any scientific information and the transfer of knowledge, the platform that stands out is Twitter, which was officially renamed as X, on July 24th, 2023.(1) By 2023, Twitter has approximately 528.3 million active monthly users worldwide. This number represents the total of users who regularly participate in and engage with the content on the platform. In Turkey, the number of Twitter users is reported to be approximately 18.55 million.(2)

The role of social media in the development of medical and surgical education, and the transmission of innovations and experiences has been increasingly gaining importance. Besides, its function for news and announcements, the interactions and shares on social media accounts have become a different indicator of impact factor today.(3)

The Journal Impact Factor (JIF) is a number calculated annually for each scientific journal, based on the average number of citations to articles published in the previous two years.(4) Quartile 1 (Q1) is a classification given by Journal Citation Reports (JCR), indicating that a scientific journal is in the top 25% in its field based on its impact factor. This classification demonstrates the importance and the prestige of a journal in its field, usually indicating journals that publish high-quality and influential researches.(5)

In this study, it is aimed to examine the relationship between the Twitter account metrics of medical journals in the Q1 category of the surgical field – such as follower counts, the number of shares, and the number of comments / replies, likes, retweets (RT), and views – and their impact factors. In the literature review, particularly in the field of general surgery, no study examining the social media usage of surgical Q1 journals has been found. This research is the first of its kind aiming to fill this gap by examining and comparing the social media activities of reputable general surgery journals. This study would help researchers to understand the strategies and the impact of Q1 journals in the field of general surgery better by exploring the relationship between their impact factor and social media usages.

MATERIAL AND METHOD

Q1 scientific journals in the field of surgery have been listed on the Scimago Journal & Country Rank page. (6) Journals in general surgery, emergency surgery, burn unit, surgical intensive care, hepatobiliary surgery, colorectal surgery, breast-endocrine surgery, and upper gastrointestinal system surgery have been included in this study. Journals in the listed Q1 category with Twitter accounts have been identified and the IF of these identified journals have been listed and ranked. Various elements such as the total number of shares, comments / replies on the shares, retweets (RT), likes, and views between June 1st, 2023 and November 30th, 2023 (last six months) on their Twitter accounts have been detected. The journals that did not share anything within the last six months have been excluded from the study. Additionally, the number of the followers of the accounts and the total number of shares since the account was opened have also been included in the study. The data for the study are collected via Twitter analytics channels and by checking account shares. In line with the objectives of this study, only the profiles that are associated with journals have been included in the analysis. The accounts that are associated with communities are excluded.

Statistical analysis

In the statistical analysis, SPSS v. 25.0 software (SPSS Inc., Chicago, IL, USA) is used. The distributions of numerical variables are examined by using both visuals (histograms and probability plots) and analytical methods (Kolmogorov-Smirnov / Shapiro-Wilk tests). Descriptive statistics are presented as median, minimum-maximum (min-max) values due to the non-normal distribution of continuous variables. Because of the non-normal distribution of the data, the Spearman method is used in the correlation analysis, and the Spearman's correlation coefficient is calculated. Scatter plots are utilized to demonstrate the correlation between the impact factor and other data. A p-value of < 0.05 is considered to be statistically significant.

RESULTS

In this study, out of the 128 journals in the Q1 category, 24 journals related to the field of general surgery have been evaluated. Of these, 18 journals (14%) that had a Twitter account and made posts within the last 6 months have been included in the study. (Table 1)

Table 1. Journals included in the study and data related to their journal accounts

Journal	Twitter handle	IF	T.posts p6m	T.replying p6m	T.likes p6m	T.RT p6m	T. view p6m	Followers	Total posts
JAMA Surgery	@JAMASurgery	16,9	201	110	2957	6579	2022887	51617	16977
Annals of Surgery	@AnnalsofSurgery	10,1	7	5	89	165	74398	55460	9967
British Journal of Surgery (BJS)	@BJSurgery	9,6	906	7530	13590	28086	1194918	45537	16036
Liver Transplantation	@LTxJournal	5	114	840	342	798	106308	5461	2768
Journal of the American College of Surgeons	@acsJACS	5,2	156	1680	468	1248	535728	34149	8186
Surgery for Obesity and Related Diseases	@SOARD_ JOURNAL	3,1	48	528	384	672	47220	4525	1588
Surgery Journal	@SurgJournal	3,8	636	1836	5724	9540	432894	22782	11059
BJS open	@BjsOpen	3,2	510	4590	4590	7650	1053606	10139	1674
Annals of Surgical Oncology	@AnnSurgOncol	3,7	582	5796	2910	6402	940344	14287	5458
Obesity Surgery	@JournalObesity	2,9	48	510	336	480	44166	2066	297
Journal of Trauma and Acute Care Surgery	@JTraumAcuteSurg	3,4	486	6174	1458	4860	1091742	25581	7658
European Journal of Surgical Oncology	@ejsotweets	2,5	167	61	1127	2179	375228	7624	3064
Journal of Gastrointestinal Surgery	@ JournalofGISurg	3,2	26	5	203	582	91052	6190	1385
World Journal of Surgery	@WorldJSurg	2,6	38	11	199	450	107021	14489	3206
American Journal of Surgery Techniques in Coloproctology	@AmJSurgery	3	594	4002	5940	12474	521796	20286	3216
Techniques in Coloproctology	@TechColoproctol	3,3	106	134	1264	3053	594542	8676	1425
Journal of Surgical Research	@JSurgRes	2,2	65	65	398	1298	214835	9983	1386
Langenbeck's Archives of Surgery	@LAOS1860	2,3	1	0	8	30	3004	1348	272

p6m: per 6 months, T. :total

The median and minimum-maximum values for IF, total shares, total comments, total likes, total RTs, total views, and the number of account users, as well as the total number of shares for all time, are presented in Table 2. This table also includes the names of the journals with the highest values for these metrics. Additionally, the correlation r and p values with IF for these parameters are also included in Table 2. (Table 2) The median value (MD) of the Impact Factor (IF) is 3.23 (min: 2.2-max:16.9). The journal with the highest IF is determined to be "JAMA Surgery".

Table 2. Statistical analysis of the parameters

	Median	Min-max	correlation with IF. r	correlation with IF. p	the highest-ranking journal
IF	3,23	2,20 – 16,90	-	-	JAMA Surgery
T.posts *p6m*	135,00	1,00 – 906,00	0,36	0,133	BJS
T.reply *p6m*	519,00	0 – 7530,00	0,37	0,127	BJS
T.likes *p6m*	797,50	8,00 – 13590,00	0,33	0,169	BJS
T.RT *p6m*	1738,50	30,00 – 28086,00	0,33	0,790	BJS
T.view *p6m*	404061,00	3005,00 – 2022887,00	0,49	**0,037**	JAMA Surgery
Followers	12213,00	1348,00 – 55460,00	0,68	**0,002**	Annals of Surgery
Total Tweet	3135,00	272,00 – 16977,00	0,76	**<0,001**	JAMA Surgery

p6m: per 6 months, T. :total, IF: Impact Factor, r: (-1)-(+1) correlation Spearman method, p< 0,05 statistically significant

Examining the data from the last six months: The MD for the total number of shares is 135 (min:1-max:906). The highest number of shares belongs to the "British Journal of Surgery (BJS)". When the correlation with IF is examined, it is found that r=0.36 and p=0.133 (Table 2, Figure 1). The MD for the total number of comments/replies is 519 (min:0-max:7530). The highest number of comments/replies is found in the BJS. The correlation value with IF is r=0.37 and p=0.127 (Table 2, Figure 2). The MD for the total number of likes is 797.5 (min:8-max:13590). The highest number of likes is in the BJS. The correlation value with IF is r=0.33 and p=0.169 (Table 2, Figure 3). The MD for the total number of retweets (RT) is 1738.5 (min:30-max:28086). The highest number of RTs is in the BJS. The correlation value with IF is r=0.49 and p=0.037 (Table 2, Figure 4). The MD for the total number of views is 404061 (min:3005-max:2022887). The highest number of views is in the JAMA Surgery. The correlation value with IF is r=0.33 and p=0.790 (Table 2, Figure 5).

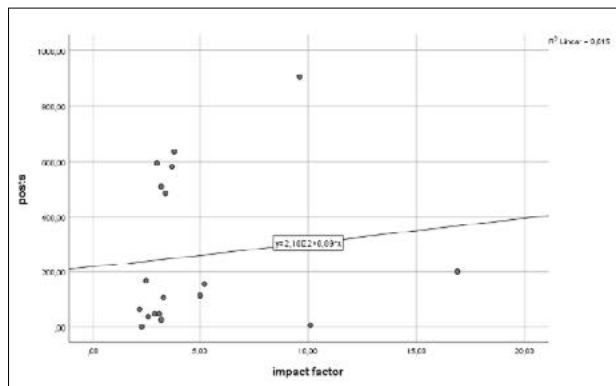**Figure 1. Correlation between IF and total shares/posts over six months**

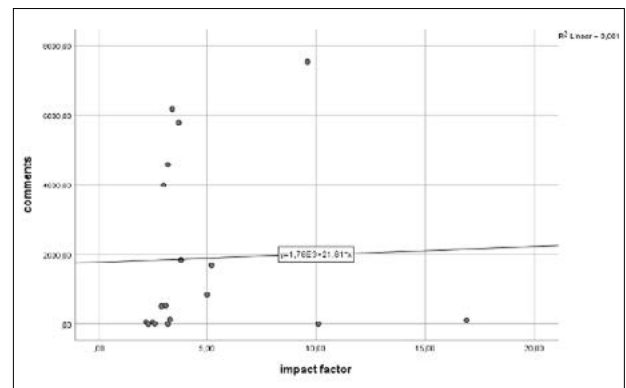**Figure 2. Correlation between IF and total comments/replies over six months**

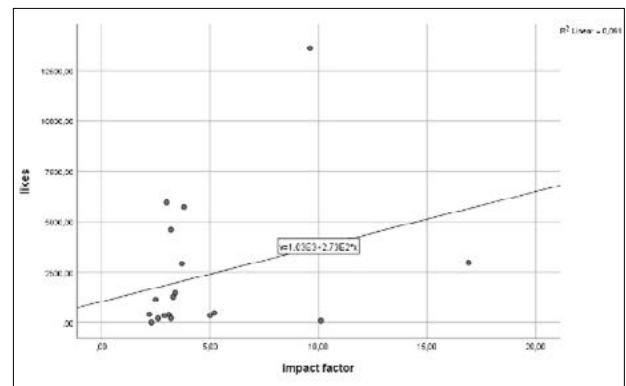**Figure 3. Correlation between IF and total likes over six months**

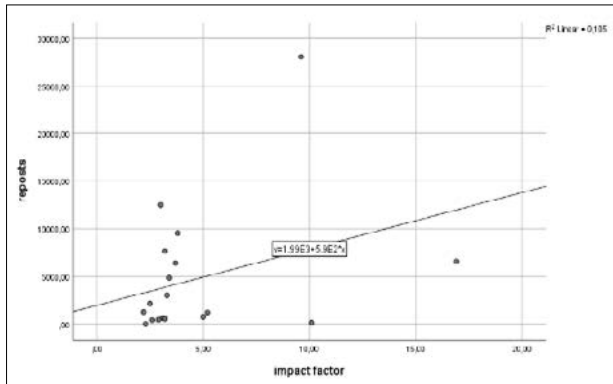**Figure 4. Correlation between IF and total reposts/RT over six months**
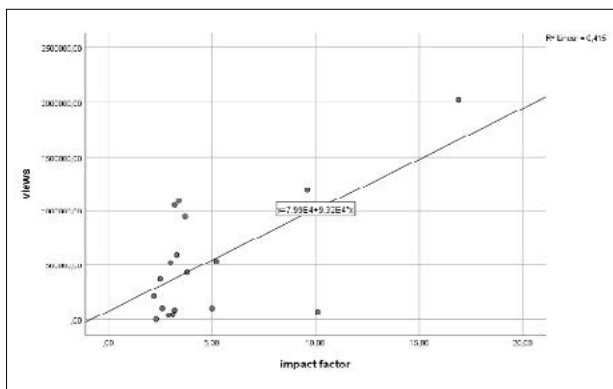

**Figure 5. Correlation between IF and total views over six months**

When the follower numbers of the journal accounts are examined, it is seen that the MD is 12213 (min:1348 – max: 55460). The highest number of followers belongs to the account of the "Annals of Surgery". Examining the correlation with IF, it shows a significant positive linear correlation with r=0.68 and p=0.002, which is considered to be statistically significant (Table 2, Figure 6).

Figure 6. correlation between IF and follower count over six months
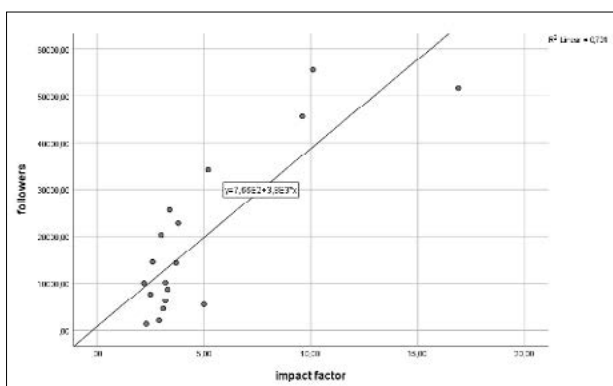
Finally, when the total number of shares (total tweets) have been evaluated since the accounts were opened, it is detected that the MD is 3135 (min: 272 – max:16977). Examining the correlation with IF, r=0.76 indicates that there is a strong significant positive linear correlation and P<0.001, which is statistically highly significant (Table 2, Figure 7).

Figure 7. Correlation between IF and total number of posts
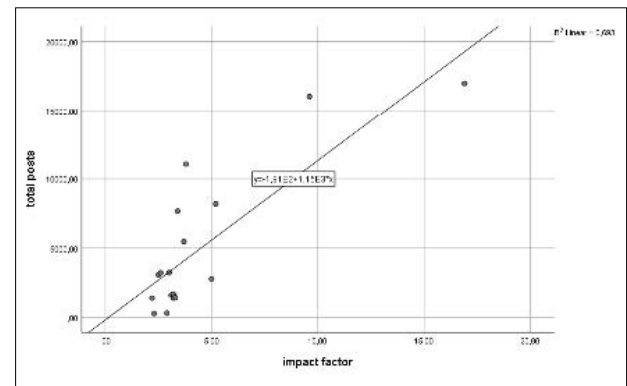
DISCUSSION

Social media has made significant contributions to medical and surgical education. Academic journals, doctors, surgeons, and medical students actively use social media for different purposes such as announcing publications, introducing new procedures and medications.(7) Using social media in this way not only facilitates information sharing, but also expands professional networks and provides faster access to information. In this context, many academic publications have been made on the use of social media in the medical field and its effects. These publications thoroughly examine the role and the importance of social media in the field of medicine.(8, 9)

In a study, it is shown that physicians use social media, particularly X (Twitter), more frequently in order to catch up on the agenda and to ensure the public has access to accurate information. This study has demonstrated that scientific journals, surgical societies, and surgeons are more active on the social media platform, resulting in an increased interaction. It is seen that on Twitter, especially under the hashtag #SoMe4Surgery, posts containing articles, guidelines, videos, and podcasts have formed a significant network for surgeons in their professional communication, access to current information, and

education. Furthermore, it has been observed that journals with high activity on social media, particularly Twitter, tend to have a high index.(10)

In this study, the total number of shares, total number of comments, total number of likes, and total number of views on the Twitter accounts of journals within the last six months have been examined to evaluate their activities. When analysing the relationship of these parameters with the IF, a significant difference and correlation have not been observed, except for the total number of views (Table 1, Figure 5). A statistically significant relationship between the total number of views and IF has been detected. (p=0.037)

Another study in the literature has indicated that urology journals with a Twitter profile have a higher average JIF compared to those without a Twitter profile. This suggests that the presence on social media can enhance or be associated with the perceived academic impact of a journal.(11)

In contrast to the literature, in our study, no relationship is found between the intensity and the activity of journals on social media and their Ifs. The average shares, likes, comments, and RT of all journals in the study have been similar. However, it is seen that a strong correlation has existed between the number of followers and the total number of shares since the account was opened with the IF. Consequently, it is believed that there is no significant relationship between a journal's IF and its activity or frequency of posting on social media. This discrepancy could be due to the differences in research methodology, specialty fields, or even the time period in which the study has been conducted. Our study encompasses a period when social media's influence has been at its peak, and using social media has been intense and widespread. Therefore, it is considered that the results in this study are to be more meaningful.

Given these results, it is believed that the correlation between IF and the number of followers and the total number of shares over time is attributed to the prestige of well-established and academically respected journals with high IF. The significant difference in viewing numbers is also a result of this. High IF reputable journals tend to have large numbers of followers and reach a wider audience due to their scholarly influence, even without

publishing large numbers of submissions or receiving heavy interaction. In summary, although social media is seen as a new tool in impact assessment in the literature, the findings of our study suggest otherwise. (12)

In conclusion, although it is commonly thought that journals actively using social media have higher Impact Factors (IF) and that there is a strong relationship between the impact power and social media activity, our study has found no difference in average activity, number of shares, likes, comments, and RTs as IF increases. On the other hand, journals with high IF, even when making a similar number of posts and receiving a similar number of likes, comments, and RTs, tend to have more followers, a higher total number of shares, and a greater average number of views. This situation is due to the high-IF journals being more established, having a longer presence on social media, consequently having more followers, and being more reputable.

Declarations

The authors have no conflicts of interest to declare. The authors declared that this study has received no financial support.

Ethics committee approval is not required since the data related to the study were obtained from the publicly available internet environment and human participants were not included in the study.

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