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Do highly cited clinicians get more citations when being present at social networking sites?

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Abstract:

BACKGROUND AND AIMS: The advent of social networking sites has facilitated the dissemination of scientific research. This article aims to investigate the presence of Iranian highly cited clinicians in social networking sites.

MATERIALS AND METHODS: This is a scientometrics study. Essential Science Indicator (ESI) was searched for Iranian highly cited papers in clinical medicine during November–December 2015. Then, the authors of the papers were checked and a list of authors was obtained. In the second phase, the authors' names were searched in the selected social networking sites (ResearchGate [RG], Academia, Mendeley, LinkedIn). The total citations and h-index in Scopus were also gathered.

RESULTS: Fifty-five highly cited papers were retrieved. A total of 107 authors participated in writing these papers. RG was the most popular (64.5%) and LinkedIn and Academia were in 2nd and 3rd places. None of the authors of highly cited papers were subscribed to Mendeley. A positive direct relationship was observed between visibility at social networking sites with citation and h-index rate. A significant relationship was observed between the RG score, citations, reads indicators in RG, and citation numbers and there was a significant relationship between the number of document indicator in Academia and the citation numbers.

CONCLUSION: It seems putting the papers in social networking sites can influence the citation rate. We recommend all scientists to be present at social networking sites to have better chance of visibility and also citation.

Keywords:

Academia, clinical medicine, highly cited, Iran, LinkedIn, Mendeley, ResearchGate, social networking sites

Introduction

Researchers usually communicate and share their knowledge through publications.^[1] On the other hand, during the few past decades, web has dramatically changed the way researchers communicate and disseminate their knowledge.^[2-4] Social networks as a new generation of web (Web 2.0) have presented a revolutionary new and opportunities for users to generate and share information in different formats.^[5-8] Social media has broadly been used including in health-care

contexts.^[5] Social networks not only have fundamentally influenced the way scientists communicate but also have changed the way of the measurement of the researcher's impact. Researchers increasingly use them to communicate and raise their visibility.^[9,10] Van Noorden reported that of 3500 scientists and engineers responding to the Nature e-mail from 95 countries, 3000 ones were familiar with social networks such as ResearchGate (RG), Academia, LinkedIn, and Mendeley.^[11]

On the other hand, to measure the impact of scientists, some metrics such as total

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number of publications, total citation counts, and citations per publication were the most commonly used metrics for a long time.^[12] Studies have shown that the more citations a paper receives; the better quality it has.^[13,14] In other words, citation analysis can differentiate papers with higher impact from a large body of publications. With regard to the importance of citations, many studies have reported highly cited papers in different specialties – emergency medicine,^[15] critical care medicine,^[16] neurosurgery,^[17,18] pediatrics neurosurgery,^[19] and orthopedic surgery.^[20]

Given the importance of the citation, Thomson Reuters has launched Essential Science Indicator (ESI) in which hot papers, top papers, and highly cited papers in 22 disciplines are introduced.^[21]

Citation-based metrics, although widely used,^[22] have some limitations,^[23] so there is currently a shift from traditional bibliometric impact scores toward new indicators. Some new approaches have been proposed such as web citation counts^[24] and download data.^[25,26] More recently new metrics called altmetrics, derived from social networking sites, have been emerged as alternative means to measure scholarly impact^[3] and give information about the wider societal impacts of research than traditional indicators such as citation counts.^[27] The presence of scholars in social networks has been investigated^[22,23,28-30] and studies have indicated the correlation between altmetrics indices and traditional citation metrics.^[23]

Bar-Ilan *et al.* found that Mendeley bookmarks were significantly correlated to Scopus citation counts.^[23] According to Mohammadi *et al.*, Mendeley readership counts can supplement citation counts in social science and some areas of engineering.^[31] Madhusudhan found that RG (54%), Academia (51%), LinkedIn (39%), and CiteULike (35%) were used by scholar at the University of Delhi.^[32] Thelwall and Kousha assessed the RG usage among different countries. RG had most users in Brazil, India, and Academia used more in China, South Korea, and Russia. Iran also had many RG members. Although web, especially social networks play an important role in disseminating research, a few studies have studied the familiarity and use of these sites by influential scientists.^[33] Mas-Bleda *et al.* assessed the use of social web by highly cited Researchers in European institutions.^[3]

Iran has tried to increase the quality and quantity of papers, in this way, the number of citations a paper receives is important. Some of the researchers have tried social networking sites to disseminate, publicize their findings, and communicate. This study investigated the presence of highly cited authors in clinical medicine in

social networking sites. If a positive relationship is found between the citations and being in social networking sites, it can be recommended to policymakers, researchers that publicizing the publications can be a way to increase the citation rate. Moreover, it can imply that new metrics based on social networking sites may be used as supplement or complement of the old citation-based metrics.

Materials and Methods

This scientometrics study was conducted in two phases. In phase I, the ESI was used to gather the data on highly cited papers during November to December 2015.

“Highly cited papers” feature was selected and Iran was entered in “country/territories” box, the retrieved data was limited to “Clinical Medicine.” To control the name variations, last name, first name (or its initial), affiliation, and subject area were considered. Then, the authors of the paper were checked and a list of authors was provided. In phase II, authors were separately searched in the selected social networking sites. Table 1 indicates the social networking sites and the indicators assessed. The data were analyzed using descriptive (frequency and percent) and inferential (Pearson’s) statistics in SPSS version 16 (SPSS, Inc., Chicago, IL, U.S.A) [Table 1].

Results

Searching ESI, 55 highly cited papers were retrieved. Of 107 researchers, participating in these papers, 64.5% were found in RG, so the RG was the most used social networking sites and LinkedIn placed in the 2nd rank, but no profile was retrieved in Mendeley [Table 2].

The mean and standard deviation of h-Index for Iranian highly cited researchers and citations in Scopus were 15 ± 12.3 and 1988.9 ± 3079.1 , respectively.

Table 3 indicates the mean and standard deviation for the indicators in the social networking sites. The means of publications in RG was 128 ± 146.5 . The means of profile views and reads were 834.5 ± 1274.9 , 6862 ± 7675.2 , respectively. The mean of citations was 1799.2 ± 3039.61 and RG score was 30.1 ± 11.9 .

Table 1: The social networks and the indicators

Web present	Indicator used
Scopus	URL citations, citation, h-index
Mendeley	URL citations, readers
Academia	URL citations, followers following, total views, documents
RG	URL citation, RG score, publications, reads, citations, profile views
LinkedIn	URL citations

RG=ResearchGate

Table 2: The presence of highly cited clinical medicine scientist in social networks

Profile	Frequency (%)
Mendeley	0
Academia	16 (15)
RG	69 (64.5)
LinkedIn	58 (54.2)

RG=ResearchGate

Table 3: Mean and standard deviation of indicators in each social networking sites

Social networks	Indicators	Mean±SD
Scopus	Citation	1988.9±3079.1
	h-index	15±12.3
RG	Publications	128±146.5
	Profile views	834.5±1274.9
	Reads	6862±7675.2
	Citations	1799.2±3039.61
Academia	RG score	30.1±11.9
	Following	3.12±4.85
	Followers	21.37±18.2
	Documents	59.13±130.2
Mendeley	Total views	741.69±1397.2
	Readers	0

SD=Standard deviation, RG=ResearchGate

In Academia, the means and standard deviation of following and followers were 3.12 ± 4.85 and 21.37 ± 18.2 , respectively. The authors had moderately 59.13 ± 130.2 papers in their profile and the mean of total views was 741.69 ± 1397.2 . None of 107 researchers were found the Mendeley.

The findings demonstrated that a large percent of the researchers (33.6%) registered in three social networking sites, whereas only 14% of them had profiles in all four social networks. Thirty (28%) of the researchers had a profile in one of and 24.3% in two of the social networks. A positive direct relationship was observed between visibility at social networking sites with citation and h-index rate ($P < 0.01$). According to regression model, visibility at social networking sites can be used to anticipate the citation rate ($P < 0.01$, $R^2:0.087$).

A significant relationship was observed between the citation rates and RG indicators ($P < 0.01$). Although according to regression model, the relationship between profile views and the number of publications was not statistically signification, the relationship between reads, citations, and RG score was significant. In other words, reads, citations and RG score can be used to anticipate the citation rate ($P < 0.01$, $R^2:0.76$).

There was a significant relationship between the total citation and Academia indicators ($P < 0.01$). The relationship was significant for all 4 indicators (followers,

following, total views, documents). According to regression model, no significant relationship was observed between the followers and following numbers and the total views with citation number, but the documents number can predict the citation rate ($P < 0.01$, $R^2:0.17$).

Discussion and Conclusion

Nowadays, social networks can be used to disseminate scholarly information in different ways. The highly cited researchers have been successful in traditional publishing,^[3] but we are going to see if they have used social networking sites to publicize their publications and if there is a relationship between citations as a traditional metrics with the presence at the social sites.

According to ESI, 55 highly cited papers were written by 107 Iranian authors. The number of highly cited papers in Turkey, Pakistan, Uganda, Egypt, and Iran was higher than other Islamic countries in the field of clinical medicine.^[34] Therefore, according to the number of highly cited papers in the field of clinical medicine in 2011, Iran was placed after the abovementioned Islamic countries. Iran should have some plans to improve its place and the number of highly cited papers. All around the world, the USA had the most highly cited scientists in this field.^[35]

Among the social networking sites investigated, RG had the most subscribers so that 64.5% of the authors of highly cited papers were found in RG. Scientists and engineers in Van Noorden's study were most familiar with RG than LinkedIn, Academia, and Mendeley. Among the scientists at art, humanities, and social science, LinkedIn was after Facebook but preceded RG, Academia, and Mendeley. The findings of our study confirm the findings of Saadat^[36] and Li *et al.*^[37] As a whole, the two largest disciplines were medicine and biology.^[38] Madhusudhan^[32] Asnafi *et al.*^[39] also reported RG as the most popular social networking site. LinkedIn was the most popular social network among highly cited researchers at European institutes.^[3] In a similar study, Haustein *et al.*^[22] demonstrated that RG followed LinkedIn, Academia, and Mendeley. In our study, LinkedIn was in the second rank, the third rank belonged to Academia while no researchers were found in Mendeley.

Since the studies have proved the relationship between the number of highly cited papers and researchers with the joint authors^[34] and the impact factor of journals,^[40] the Iranian researchers should be directed to publish their papers in journals with higher impact factor and they should be encouraged to have scientific cooperation's with authors from other countries.

Social networking sites can help them to be visible to other scientists and be visited by their colleagues and other scientists around the world, it is suggested that the Iranian researchers be encouraged to subscribe these sites to have more chance to be cited.

Some studies have shown the relationship between Mendeley readership and citation numbers,^[23,31] but none of Iranian influential scientists were found in this social networking site. The scientists should be informed about the advantages of these social networking sites such as Mendeley. The mean of h-index in Scopus was 15 ± 12.3 . This is higher than the h-index of Iranian epidemiologists which was 3.9.^[41] This study confirmed the relationship between the citation rate and social networking sites indicators. A significant relationship was observed between the RG score, total reads, and total citations in RG and there was a significant relationship between a total number of papers in Academia and the citation numbers.

Social networking sites have introduced new channels to scholars to disseminate information and communicate. On the other hand, citation metrics show the impact of a scientist. This study indicated the relationship between social networking sites presence and citation rates and h-index. It implies that presenting the papers in social networking sites can increase the chance of citation and h-index. Besides that, it includes this message that new metrics based on social networking sites can supplement and complement the old metrics, especially that these new metrics have some advantages rather than old ones. We recommend all scientists to be present at social networking sites to have better chance of visibility and also citation.

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Conflicts of interest

There are no conflicts of interest.

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