

Comparison of the Social Impact of Review Articles with Original Research Articles in the Field of Library and Information Science Indexed in WoS

Abbas Doulani*, Mahnaz Behpour, Zoya Abam

Department of Information Science, Faculty of Education and Psychology, Alzahra University, Tehran, IRAN.

ABSTRACT

The purpose of this study was to compare the social impact of review articles with the original research articles in the field of Library and Information Science indexed in Web of Science. This research has been done in terms of the purpose of the applied type and in terms of methodology is survey with the Altmetric analysis approach. The study population in this study consists of review and original research articles in the field of Library and Information Science. The results of the review of research questions showed that there is a significant difference between review articles and original research articles in terms of reading in Mendeley, sharing on Twitter, receiving citations in Wikipedia, and No significant differences between the reflection of review and original research articles in News media and policy. The results showed, the social impact of review articles was more than original research articles. So the results show the importance of review articles in the body of scientific publications. Accordingly, it is necessary for writers and researchers and subsequently scientific journals, realizing the importance of these articles in the development of science interactions with society, to pay more attention to their acceptance and publication.

Keywords: Library and Information Science, Social Impact, Review Article, Research Article, and Altmetric Indexes.

Correspondence

Abbas Doulani

Department of Information Science,
Faculty of Education and Psychology,
Alzahra University, Tehran, IRAN.
Email id: a.doulani@alzahra.ac.ir
ORCID ID: 0000-0002-6917-0097

Received: 11-06-2022

Revised: 02-08-2022

Accepted: 26-11-2022

DOI: 10.5530/jscries.11.3.41

INTRODUCTION

Citation has long been used as an indicator to measure the effectiveness of scientific products. However, citation has been affected by several shortcomings such as citation bias, the ability to distinguish between affirmative and negative citations, limited coverage of resources in citation databases, technical and human limitations of citation indexes, and linguistic bias.^[1] The emergence and subsequent expansion of the social web has promised to provide tools to address or reduce or complement some of these shortcomings.^[2] Therefore, Altmetrics indicators are one of the most important tools coming from the social web.

For the first time, Neylon and Wu introduced the concept of altmetrix in the form of metrics at the article level as an alternative to the impact factor and index h , both of which originated from traditional citation databases.^[3] Priem, Piwowar and Hemminger then extended the term to social media indexes.^[4] In various texts of these new indicators as a tool to measure the initial impact,^[1] Types of scientific impact,^[5] It is also mentioned as a new and complementary

method of citation-based indicators.^[6-8] Altmetric indicators have the potential to be used in addition to scientific articles as metrics to evaluate the effectiveness of journals, individuals, datasets, books, archives, web pages, presentations, and videos. In addition to the formal impact measured by the number of citations, these indicators are able to reflect other aspects of the impact, such as the number of times each article is read, viewed, or downloaded, as well as the number of times Social media and news media refer to it.^[9] Thus, while citations refer only to the impact and use of scientific products, Altmetric indicators are able to measure other types of impact called social, educational, economic, and technological impact of scientific works.^[10,11]

Despite the identification and acceptance of a wide range of Altmetric indicators, there are still ambiguities in determining the exact meaning of each indicator and their level of effectiveness.^[12] In this regard, categories of Altmetric indicators based on the level of application and acceptance have been presented.^[12-14] In the meantime, Junping and Houqiang, knowing that there is a lot of confusion in accepting or rejecting Altmetric indices, which is due to the number of indices and the uncertainty of the exact meaning of each of them, inspired by previous research (which in the lines Mentioned above) presented a new classification of types

Copyright

© The Author(s). 2022 This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

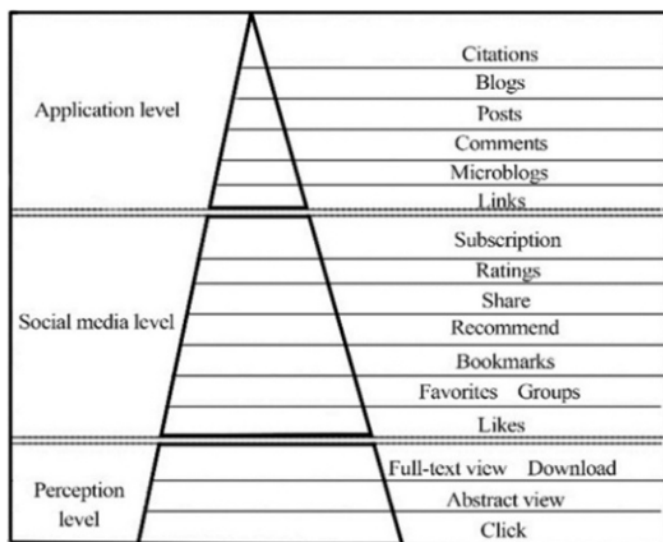


Figure 1: Stratification of Altmetrics indicators in the pyramid form.^[12]

of metamorphic indicators. This category has three main categories and is arranged in the shape of a triangle (Figure 1).

In general, Altmetric indicators are divided into three levels: perception, social media and application. Number of clicks, downloads, view the abstract or the full text of the article in the first category (perception level), and the number of likes, bookmarks, recommendations and sharing in the second category (social media level, and the number of links, comments, citations are also relevant indicators to the third level (application level).

It can be said that the classification of Altmetric indices so far includes the effectiveness of articles on levels other than citation databases such as Scopus and Web of Science. In fact, these indices are considered completely separate from traditional scientometric indices. However, there are other categories that examine the effectiveness of articles with both indicators, Scientometric and Altmetric, at the same time, such as Lin and Fenner.^[15] But apart from what has been said about Altmetric, the main concern of research policymakers right now is to ensure the effectiveness of research. This concern is expressed in the term “Based on Impact” and is used to describe organizations that are managed in order to create the desired impact on the environment, and not just to produce output.^[15] “Based on Impact” means that the most importance is given to the “effectiveness of research” and that decisions in the field of research are made with a view to the perspective of effectiveness. Raghu and Manjunatha believe that the effect of research should be a change or benefit to the economy, society, culture, public practice or services, health, environment or quality of life, beyond the scientific environment.^[17] In the midst of the heat of attention to the growth of scientific articles and productions, we must look

beyond the statistics of scientific productions with a forward-looking view. The launch of research and its impact after several years of its publication should bring prosperity, wealth, health and happiness to society. To achieve scientific and educational progress and achieve the minimum of development, research is the primary cornerstone and that is why it is always possible to establish a direct relationship between the level of research performance in any society and the level of development of that society. In a way, it can be claimed that without it, no country will be able to identify and solve existing problems and develop a strategy for development and progress. At present, there is much debate in scientific, academic, and even political circles about the effects that science and research have had on the development of society. For example, can economic development be expected to increase research and growth in the number of research outputs? If such an expectation exists, what part of the economy should be considered exactly? The same question is asked about the impact of research on other areas.

Achieving development and identifying the existing problems of any country requires practical and effective research. In order for the effects of research to be seen and evaluated, its dimensions and areas of impact must be clear and policy makers must know in what dimensions to evaluate the effectiveness of a research. The main question is how this effect can be measured and what indicators and dimensions are used to measure the effectiveness of research? In this regard, first of all, various indicators affected by research should be identified. Only then can policymakers be aware of the impact of research on various areas and then make better decisions. Now is the time for scientometrics specialists to take a step forward and, in addition to examining the production of science, also evaluate the impact and consequences of this production. Thus, in addition to paying attention to the initial product of the research, new knowledge that will be current as a result of this process in the fields of education, industry, etc. should also be considered. Identifying the dimensions and areas affected by the research as much as possible can be a key step in evaluating the impact of the research. A single list of dimensions of research effectiveness facilitates the measurement of research effectiveness for policymakers and researchers, and improves their decision-making and planning in the areas of investment.^[18]

In the meantime, academic publications, especially scientific articles, are a clear manifestation of scientific activities. One of the questions in this regard is which category of academic papers can have a greater social impact?

Bornmann^[10] believes that articles that review previous research and provide evaluative reports have greater potential for social impact. Accordingly, the present study seeks to answer the question of whether review articles really have

a greater social impact than original research articles? The answer to this question can lead to the enrichment of the field of measuring the social impact of science as well as improving the position of review articles in scientific texts.

On the other hand, previous studies in the field of Altmetric have generally examined articles with Altmetric indices or compared the scientometric indices of articles with Altmetric indices and their impact on each other. Therefore, in this study, according to social impact indicators,^[12] we intend to compare review and research articles in the field of Library and Information Science on WoS. It seems that the results of the present study can evaluate the process of scientific products Examine at the level of article types. Based on this, the following questions were designed as research questions that give the results of comparing articles in the field of library and information Science in three levels of reception, social media level and application level.

1. Is there a significant difference between review articles and original research articles in terms of Altmetric score?
2. Is there a significant difference between review articles and original research articles in terms of read index in Mendeley?
3. Is there a significant difference between review articles and original research articles in terms of sharing index in Twitter?
4. Is there a significant difference between review articles and original research articles in terms of citation index in Wikipedia?
5. Is there a significant difference between review articles and original research articles in terms of reflection index in news media?
6. Is there a significant difference between review articles and original research articles in terms of reflection index in policy documents?

Literature Review

Regarding Altmetric indices, various researches have been done which can be divided into several groups: 1- Studies comparing the effects of Altmetric indices on traditional scientometric indices. 2- Studies that examine articles in various subject areas or specific journals with Altmetric indicators. 3- Studies that review articles from different fields or specific journals based on in specific scientific social networks. In this section, due to the multiplicity of researches, only the most relevant cases will be mentioned.

In a study, Galickas, and Flahert assessed travel journal articles using scientometric and altmetric indices. The results showed that there is a weak correlation between traditional

indices and Altmetric indices. In other words, increasing the score of traditional indicators such as citations and etc. in databases, has had little effect on increasing the Altmetric score of the articles.^[19] Akella (2021) in a study entitled “Early indicators of scientific impact: Predicting citations with altmetrics” examined the impact of Altmetric indicators on traditional scientometric indicators. The results showed that Mendeley social networks, Twitter, have a great impact on increasing citations and traditional scientometric indicators in general.^[20] In this regard, studies such as the two above-mentioned studies have been conducted that have examined the effect of Altmetric indices on scientometric indices. Such as Lehane, and Black (2021), Nagarajan and *et al.* (2021), Mazarakis, and Peters (2021), Shenavar and Doulani (2020).^[21-24]

In a study, Moral-Munoz and Cobo, reviewed rehabilitation articles published between 2013–2017 on WoS based on Altmetrics indicators. The results showed that Twitter and Linked In had the most and the least impact on Scientometric Indicators of Rehabilitation Articles, respectively. In this study, they identified the top 10 articles based on the amount of citations received in WoS and Altmetric score. But the articles that came first in each ranking were different; therefore, the results showed that there is no permanent correlation between Altmetric score and citation rate.^[25] Pooladian and Borrego reviewed articles published in library and information journals indexed Social Science Citation index and their markup on the Mendeley social network over a 20-year period. The results showed that 61% of the articles mentioned had at least one markup on Mendeley.^[26] Xia and *et al.* reviewed articles in Journal of Nature and the impact of the process of sharing them on Twitter and increasing the rate of citations received in citation databases. Assuming that Twitter is the most important social media in sharing scientific articles, they showed that there is a statistically significant and positive relationship between the number of articles’ tweets and the citations they receive.^[27] In a study, Hausteina and *et al.* examined the relationship between citation rates for biomedical articles and their Altmetric activity on Twitter. The results showed that there is a positive and significant relationship between these two variables and the articles viewed or read and ... in the social network Twitter had experienced more citations.^[28] In a study, Piwowar reviewed research articles based on a variety of social media. The results showed that about 80% of the articles published in PLOS ONE Journals were read in Mendeley; while the citation rate for these articles on Wikipedia was only five percent.^[29] In a study, Bar-Ilan and *et al.* reviewed articles published in JASIST journal on the Mendeley social network. The results showed that there is a statistically significant relationship between the number of times the articles were marked in Mendeley and the number of citations received by those articles in the WoS. Therefore,

displaying information on social networks can affect the level of visibility and ultimately citation in databases.^[6] Li, Thelwall, and Giustini, while studying the bookmarking of articles published in Science and Nature journals on social media, state that 92% of these articles are tagged by at least one user on Mendeley and 60% on Ulike. In a study, Eysenbach (2011) reviewed 4,208 tweets published in 286 articles in Journal of Medical Internet Research. The results showed that there is a statistically significant relationship between the numbers of articles shared on Twitter and the amount of citations received on WoS. Also, articles published on Twitter are 11 times more likely to receive citations and become highly cited articles.^[30]

A review of the theoretical foundations and background of the research shows that most of the research on the subject of the present study is in the form of three groups of studies mentioned at the beginning of the research background, and in such studies, the study of indicators in Level of article type (review and original research) has not been done. It seems that the results of this research, while adding an innovation in the methods of measuring articles, cause similar studies in other subject areas and other types of articles and other information formats.

METHODOLOGY

This research is applied in terms of purpose and methodologically using Altmetric analysis method. The study population in this study is a review and original research articles in the field of Library and Information Science that have been indexed in the WoS during 2017. It should be mentioned, considering that the WoS is the most reliable citation database and also because the search strategies for separating review and research articles in other databases such as Scopus are different and often have false drops and There is too much mixing of different articles with each other, so the WoS was used for the uniformity of the research samples.

Because articles have a relative opportunity to be seen on social media, 2017 is considered for this study. Also It should be mentioned,, the reason for choosing the year 2017 for searching and selecting the articles was that according to the purpose of the research, which was to investigate the social impact of various types of review and research articles, a few years should pass since the publication of the articles before the articles have the opportunity to be cited. Also, due to the fact that old articles naturally have more citations, therefore, a period of almost 4 years was chosen to take into account both the time of citation and the novelty of the articles.

To retrieve research and review articles in each field, first, thematic categories were identified in consultation with experts and the following search formulas were used for review and research articles, respectively:

((PY=2017 AND WC= (“category1”) AND TI=(Meta analysis OR meta-analysis OR systematic review OR literature review OR Meta synthesis)))

((PY=2017 AND WC= (“ category1”) NOT TI= (Meta analysis OR meta-analysis OR systematic review OR literature review OR Meta synthesis)))

The search was conducted in April 2021, thus resulting in the retrieval of 16068 research articles and 126 review articles in the field under study, which form the current research community. Regarding the search strategy and the use of the number of parentheses, it is necessary to note that the amount of use of parentheses in separating search items and keywords will have a great impact on the number of searched articles, Subsequently this greatly affects the amount of false drops or unwanted results affect, so researchers with trial and error of different search strategies, selected strategy as the search strategy with the least unwanted results. Due to the heterogeneity of the statistical population, the number of samples in each category was determined separately based on the Krejcie-Morgan table, so that out of 16068 research articles, 376 articles were selected as samples and considering that the total review articles in the range at the time of the research, there were 126, so all articles entered the analysis stage. In selecting samples and to overcome the limitations of search strategies, which sometimes led to the retrieval of items that were not a review or research article, the title of the selected sample was reviewed, and in case of discrepancy the next article was replaced.

To collect data, Bookmarklet software belonging to Altmetrics.com was used to collect data. For each article selected as a sample, information from the WoS database including record number, article title, author name, journal title, number of citations received, and DOI number was collected and recorded in an Excel file. Also, in order to get the Altmetrics score of each article, the related DOI was searched on doi.org, and on the main page of the article publisher, by clicking on Bookmarklet, the article Altmetrics information including Altmetrics score, Twitter score, news score, score Mendeley, etc. were noted.

Regarding the Altmetric score, it should be noted that this score is a quantitative scale to show the amount of attention to articles, which is extracted from the following three main criteria.

Table 1: Frequency of review and research articles.

Type of Articles	No.	Samples
Research	16068	376
Review	126	126

Table 2: Kolmogorov-Smirnov test to check the normality of the data.

Variables	Standard deviation	Z Kolmogorov Smirnov	P-value
Research Articles	3/23	0/699	0/04
Review Articles	3/71	0/701	0/01

Table 3: Rate of review and research articles in terms of reading on Mendeley, mentioning on Twitter, receiving citations on Wikipedia, News media and policy documents.

Type of Articles	Mendeley		Twitter		Wikipedia		News media		Policy documents		Score of Altmetric
	Frequency	percent	Frequency	percent	Frequency	percent	Frequency	percent	Frequency	percent	
Research	74	58/13	11	9/5	2	2/1	5	4/2	1	0/9	18/79
Review	97	26	10	2/4	26	7/2	3	0/7	3	0/2	29/48

1. Volume: Article score increases in base of number of received citations to the article increases.
2. Sources: Each article gets different score depending on the source of publication; For example, a newspaper article has more score than a blog post, and a blog post has more than one tweet.
3. Authors: Examine in what period of time or how often authors of each citation talks about an article.^[29]

Also, descriptive statistics including mean and frequency were used to analyze the data and Kolmogorov-Smirnov and Mann-Whitney tests were used for inferential statistics. The Kolmogorov-Smirnov test was used to ensure the normality of the data distribution, and since the data distribution in this study was abnormal, the non-parametric Mann-whitney test was used to compare the medians, which is the nonparametric equivalent of the independent *t*-test.

Finding

After searching for articles in the study period, review and research articles were identified in the WoS database. Table 1 shows the number of articles in each group.

Kolmogorov-Smirnov test was used to check the normality of the data. The results show that the coefficient obtained is significant for the data, which indicates that the data does not have a normal distribution and non-parametric tests should be used to analyze them (Table 2).

Altmetrics Indicators

Assessing of review and research articles in terms of Altmetrics indicators shows that the average review articles in terms of readability in Mendeley, Twitter and reflection in news media and policy documents is higher than research articles, and only in Wikipedia more research articles are cited. Also, Altmetric score of review articles is 22.35 and Altmetric score of original research articles is 14.96, which indicates that the Altmetric score of review articles is higher (Table 3).

Table 4: Man-Whitney test results for comparing the average of review and research articles in terms of Altmetric score.

Variables	Mann-Whitney U test	p-value
Articles (review- research)	3/127	0/001

Table 5: Man-Whitney test results to compare the average of review and research articles in terms of reading score in Mendeley.

Variables	Mann-Whitney U test	p-value
Articles (review- research)	3/516	0/000

Table 6: Man-Whitney test results for comparing the average of review and research articles in terms of sharing on Twitter.

Variables	Mann-Whitney U test	p-value
Articles (review- research)	17/295	0/03

Research Questions

1. Is there a significant difference between review articles and original research articles in terms of Altmetric score?

Based on the collected data, the average altmetric score of review articles is 29.48 and the average altmetric score of original articles is 18.79, which indicates the higher social impact of review articles compared to original articles. Now, in order to investigate the fact that the difference between review and research articles is statistically significant in terms of Altmetrics indices, due to the abnormality of data distribution, the non-parametric Mann-Whitney test was used. The results of this test show that there is a significant difference (p -value= 0.001) between review articles and original research articles in terms of Altmetric score (Table 4).

2. Is there a significant difference between review articles and original research articles in terms of read index in Mendeley?

According to statistical data, the reading rate of review articles in Mendeley is 74 and the rate of the same index for original research articles is 97 (Table 3). Mann-Whitney test was used to evaluate and compare the average of review and research

articles in terms of reading score in Mendeley. The test results can be seen in Table 5. Considering the results and the difference between the reading rate of review and research articles in Mendeley (p -value = 0.000), that can be concluded, the difference between the articles the review and original research articles are worth considering in terms of reading.

3. Is there a significant difference between review articles and original research articles in terms of sharing index in Twitter?

According to Table 3, the rate of sharing review articles on the Twitter social network is 11 and the rate of the same index for original research articles is 10. Mann-whitney test was used to review and compare the average of review and research articles in terms of Twitter sharing index. The results in table 6, confirm the significant difference between the rate of sharing review and research articles on Twitter (p -value = 0.03).

4. Is there a significant difference between review articles and original research articles in terms of citation index in Wikipedia?

According to the data in Table 3, the rate of receiving citations of review articles in Wikipedia 2 and the rate of the same index for original research articles is 26. The Mann-Whitney test was used to examine and compare the average of review and research articles in terms of citation index in Wikipedia. The test results can be seen in Table 7. The results confirm the significant difference between the index of receiving citations of review and research articles in Wikipedia (p -value = 0.01).

5. Is there a significant difference between review articles and original research articles in terms of reflection index in news media?

According to the data in Table 3, the reflection rate of review articles in news media is 5 and the rate of the same index for

original research articles is 3. Mann-Whitney test was used to evaluate and compare the average reflection rate of review and research articles in news media. The test results can be seen in Table 8. The results confirm that the difference between the reflection index of review and research articles in news media is not significant (p -value = 0.07).

6. Is there a significant difference between review articles and original research articles in terms of reflection index in policy documents?

According to the data in Table 3, the reflection rate of review articles in policy documents is 1 and the rate of the same index for original research articles is 3. Mann-Whitney test was used to evaluate and compare the average reflection rate of review and research articles in policy documents. The test results can be seen in Table 9. The results confirm that there is no significant difference between the reflection index of review and research articles in policy documents (p -value = 0.12).

CONCLUSION

The summary of each research should answer the question: what is the final result of this research and what has been added to our previous knowledge about the subject of research? Examining the obtained answers to the research questions can somehow show the status of Library and Information Science articles at the level of various articles in scientific social networks. According to the introduction of the research, the present study has compared the social impact of reviewed and original research articles indexed on WoS, which based on the results of research tests, the following conclusion have been obtained.

In the first question of the present study, the Altmetric score of the reviewed and original research articles was analyzed. The results showed that the altmetric score of the review articles was 29.48 and the average altmetric score of the original articles was 18.79, which due to the statistical test and the significance of the difference, indicates a higher social impact of the review articles than the original articles. In explaining the result, it can be said that in review articles, the results presented in scientific writings on a specific topic are summarized and evaluated. These types of articles may examine anything, and are designed to summarize, analyze, and evaluate information that has already been published. In such articles, rare experimental and new findings are reported. Review articles have a well-defined narrative, are usually critical, and should provide theoretical and emerging interpretations. An important role of review articles is to guide the original scientific writings. For this reason, the accuracy and completeness of the citations provided is essential. Although most or all of the information provided in the review article has already been published, the new edition usually does not pose a problem

Table 7: Man-Whitney test results for comparing the average of review and research articles in terms of citation on Wikipedia.

Variables	Mann-Whitney U test	p-value
Articles (review- research)	8/121	0/01

Table 8: Man-Whitney test results for comparing the average of review and research articles in terms of reflection in news media.

Variables	Mann-Whitney U test	p-value
Articles (review- research)	5/589	0/07

Table 9: Man-Whitney test results for comparing the average of review and research articles in terms of reflection in policy documents.

Variables	Mann-Whitney U test	p-value
Articles (review- research)	3/326	0/12

because the nature of the review of a work is usually clear and accepted. Hence, the extent and scope of the influence of these articles is wider. With these descriptions, it can be concluded that review articles in scientific and social circles are the subject of discussion of many experts and researchers.^[31] Therefore, other researchers can use new ideas as a basis for their research by reviewing opinions, the amount of shares, observing what has been read, and so on.

The second research question examined the difference between review and original research articles in terms of reading index in Mendeley. The analysis of the average reading rate of reviewed and original articles studied in Mendeley showed that the reading rate of reviewed articles is higher than the original articles in Mendeley. Also, according to the results of the statistical test, the significance (p -value = 0.000) of the difference between the reading rate of review and research articles in Mendeley is confirmed. In explaining the result, it can be said that in some previous studies Mendeley and Twitter have been named as the most important social media Mendeley also provides popular communication tools, especially in information and computer science.^[27,28,32,30]

On the other hand, Mohammadi, Thelwall and Kousha, found in their research that Mendeley information content indicates the low presence of researchers in some fields of social sciences and instead the strong presence of basic sciences and medicine,^[33] which confirms the data of this study. The reason for not using Mendeley by other researchers may be the lack of knowledge of such scientific social networks or differences in research behaviors in the field. Mendeley shows the possibility of sharing the article in full text, as well as citing and tracking the use and reading of an article. It seems that the identification of these capabilities by members of the two scientific fields of information science and computer science is more; because information science is more concerned with citation studies and analysis of co-authored networks. Therefore, it is obvious that if the use of a platform in a field becomes common, experts will welcome it more, just as the large presence of information science and computer specialists from scientific social networks, can be a reason for more Mendeley success among these disciplines. In addition, Mendeley is a social reference management software and has many capabilities to manage, store, cite and share scientific works.^[28]

In the third question, the index of sharing review and original research articles on the social network Twitter was examined. The analysis of the average share of review and original articles on Twitter showed that the share of review articles is more than the original research articles on Twitter. Also, according to the results of the statistical test, comparing the means of these two groups, it was found that there is a significant difference between review articles and original

research articles in terms of sharing on Twitter. Explaining the result, it can be said that Twitter, as a social media that represents the public sharing of articles, is the second social media after Mendeley, in which review and research articles are mentioned more. In several studies, the results of the prominent role of the social network Twitter in the sharing and marking of scientific articles, which confirms the results of the present study. Moral-Munoz and Cobo, research showed that the rate of sharing researchers' articles on Twitter is more prominent among other social media.^[25] In a study by Xia and *et al.* the findings show that Twitter users paid more attention to Nature journal articles than Facebook users, and the impact of the magazine's articles grew faster and faster on Twitter than on Facebook compared to different years.^[27] Looking at the results of the above research, it can be concluded that the status of library and information Science articles of any kind in social networks are almost the same as articles in other similar subject areas. Therefore, the results of this research are in line with the results of the above research.

The fourth question examined the citation index of review and original research articles in Wikipedia. Examining the average citation rate of review and original articles in Wikipedia showed that the average citation rate of original research articles in Wikipedia is higher than review articles. Also, this difference was confirmed due to the significance (p -value = 0.01) of the statistical test result. Also, the findings of this study show that regardless of the higher number of citations of the original research articles than review articles, in general, the presence of review articles and research in "Wikipedia" is very low. Social media is the representative of public citations to scientific articles. Wikipedia was created in 2001 and is less popular among academics, but it is growing.^[29] This may indicate that Wikipedia articles rely heavily on academic and scientific research evidence, or that researchers and academics do not trust the scientific use of this social network.

In the fifth question, the index of reflection (presence) of review and original research articles in news media was examined. Examination of the average rate of reflection of review and original articles in news media showed that the frequency of news reflection of review articles is 5 and original research articles are 3. This means that review articles are reflected in the news media a little more than the original articles. However, according to Mann-Whitney statistics in comparing the average of these two groups, it was found that there is no significant difference between the news coverage of review and original articles in news media. It seems that in general, scientific articles in news media and other such media have a very low visibility rate or any other Altmetric index such as sharing, citation, reading, etc. This can be traced to the characteristics of news media and their users. Scientific articles, regardless of their type (review or research) can not be

as materials or sources or information related to news media. Therefore, such media are not a good source for the presence of scientific articles. This situation can also be seen in the results of question 6 of the research, which is the difference between the presence of review and research articles in policy documents. In a way, the reasons for the lack of prominent scientific articles (in this study, articles in the field of Library and Information Science) in the news media can also be considered true in policy documents.

As a final conclusion of this research, we can refer to the opinion of Bornmann, and Marx, (2014), they state that an approach called evaluation report can be offered to measure the social, cultural, environmental and economic impact of research. They believe that if research is a feature of an evaluation report, it will have a greater social impact. These features are: 1. the evaluation report should be a summary of the research situation on a particular topic that reflects the knowledge available to that community. 2. The evaluation report should be fully comprehensible so that readers unfamiliar with the subject can also understand it. 3. This report is in fact the secondary literature of science, so it should include all the articles on the subject that are published in review journals, monographs, manuals and textbooks. 4. The evaluation report should be written by experts in the field to ensure its quality. 5. The evaluation report should be reviewed by critics to both confirm its accuracy and provide suggestions for improvement. 6. Because these reports are read by scientists in other fields and non-scientists, they should be reviewed not only by an expert in the field but also by someone else such as a government, industry or counseling center trustee. 7. Based on the results of primary literature (systematic review). Given these characteristics that Bortman presents, and based on the findings of this study, which show that review articles have a greater social impact in almost all areas, it seems that current review articles largely have the characteristics of an evaluation report. Bar-Ilan, *et al.*, also points out that in the fields of technology, social sciences, and the humanities, it is possible to write more evaluative reports than in the basic sciences.^[6] On the other hand, the publication of research outputs in the social web environment, because it increases the visibility of these documents and exposes them to a wider group of audiences, is also effective in the amount of future citations of these outputs and causes It is possible to increase the quality performance indicators of the relevant journals in the future by receiving more citations. Therefore, it can be stated that there is a two-way relationship between Altmetric performance indicators and quality indicators of scientific journals, the increase of each of which can be effective in increasing the other.^[24] Finally, the results of this study give the importance of review articles in the body of scientific publications. Accordingly, it is necessary for writers and researchers and subsequently scientific journals,

realizing the importance of these articles in the development of science interactions with society, to pay more attention to their acceptance and publication. It can also be expressed as a recommendation for future research in this field, one of the search difficulties for users is to separate different types of scientific documents from each other in database search systems. If the strategy designed in the current research is very long and has many specialized signs and abbreviations, it is recommended to first take into account such matters in the design of databases and experts to facilitate such search processes and by Other information specialists should examine all kinds of scientific productions in terms of citation behavior and the amount of use by users.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

1. Thelwall M, Haustein S, Larivière V, Sugimoto CR. Do altmetrics work? Twitter and ten other social web services. *PLoS One*. 2013;8(5):e64841.
2. Wouters P, Costas R. Users, narcissism and control: tracking the impact of scholarly publications in the 21st century. 2012;847-57.
3. Neylon C, Wu S. Level metrics and the evolution of scientific impact. *PLoS Biology*. 2009;7(11):e1000242.
4. Priem J, Piwowar HA, Hemminger BM. Altmetrics in the wild: Using social media to explore scholarly impact. *arXiv preprint arXiv:1203.4745*. 2012.
5. Haustein S, Peters I, Sugimoto CR, Thelwall M, Larivière V. Tweeting biomedicine: An analysis of tweets and citations in the biomedical literature. *Journal of the Association for Information Science and Technology*. 2014;65(4):656-69.
6. Bar-Ilan J, Haustein S, Peters I, Priem J, Shema H, Terliesner J. Beyond citations: Scholars' visibility on the social Web. *arXiv preprint arXiv:1205.5611*. 2012.
7. Costas R, Zahedi Z, Wouters P. Do "altmetrics" correlate with citations? Extensive comparison of altmetric indicators with citations from a multidisciplinary perspective. *Journal of the Association for Information Science and Technology*. 2015;66(10):2003-19.
8. Mafrahi N, Thelwall M. When are readership counts as useful as citation counts? S copus versus M endeley for LIS journals. *Journal of the Association for information Science and Technology*. 2016;67(1):191-9.
9. Galligan F, Dyas-Correia S. Altmetrics: Rethinking the way we measure. *Serials review*. 2013;39(1):56-61.
10. Bornmann L. Do altmetrics point to the broader impact of research? An overview of benefits and disadvantages of altmetrics. *Journal of Informetrics*. 2014;8(4):895-903.
11. Holmberg K. Classifying Altmetrics by Level of Impact. In *ISSI 2015*. Retrieved February 20 2019, from <https://pdfs.semanticscholar.org/49df/91ccd2579b4b345c135a6ff751bf39f7ee86.pdf>
12. Junping Q, Houqiang Y. Stratifying Altmetrics Indicators Based on Impact Generation Model. In *Proceedings of ISSI 2015 Istanbul: 15th International Society of Scientometrics and Informetrics Conference*. 2015.
13. Colledge L. *Snowball metrics recipe book*. Amsterdam: Snowball Metrics Program Partners, 110. 2014. Retrieved February 20, 2019, from https://www.snowballmetrics.com/wp-content/uploads/snowball-recipe-book_HR.pdf
14. Holmberg K, Bowman T D, Diégah F. The meaning of impact in Into three altmetrics. *Scientometrics*. 2015;103(3):1123-44.
15. Lin J, Fenner M. Altmetrics in Evolution: Defining and Redefining the Ontology of Article-Level Metrics. *Information Standards Quarterly* 25:20-6. Online verfügbar unter http://www.niso.org/apps/group_public/download.php/11273/IP_Lin_Fenner_PLOS_altmetrics_isqv25no2.pdf, zuletzt geprüft am 2013;4:2016.
16. Smith G, Sutherland A. The new diplomacy: Real-time implications and applications. *Canadian Foreign Policy Journal*. 2002;10(1):41-56.
17. Raghu CN, Manjunatha A. Assessing effectiveness of research for load shedding in power system. *International Journal of Electrical and Computer Engineering*. 2017;7(6):3235.
18. Ouchi A, Saberi MK, Ansari N, Hashempour L, Isfandyari-Moghaddam A. Do altmetrics correlate with citations? A study based on the 1,000 most-cited articles. *Information Discovery and Delivery*. 2019;47(4):192-202.
19. Galickas D, Flaherty GT. Is there an association between article citations

- and altmetrics in travel medicine research?. *Journal of Travel Medicine*. 2021;28(8):taab115.
20. Akella AP, Alhoori H, Kondamudi PR, Freeman C, Zhou H. Early indicators of scientific impact: Predicting citations with altmetrics. *Journal of Informetrics*. 2021;15(2):101128.
 21. Lemke S, Mazarakis A, Peters I. Conjoint analysis of researchers' hidden preferences for bibliometrics, altmetrics, and usage metrics. *Journal of the Association for Information Science and Technology*. 2021;72(6):777-92.
 22. Nagarajan A, Raamkumar AS, Erdt M, Vijayakumar H, Luo F, Zheng H, Theng YL. Altmetrics for Research Impact Actuation (ARIA): An Impact Tracking Tool for Multidisciplinary and Role-based Cross-Metric Analysis. *Journal of Altmetrics*. 2021;4(1).
 23. Nuredini K, Peters I. Enriching the knowledge of altmetrics studies by exploring social media metrics for Economic and Business Studies journals. In *Proceedings of the 21st International Conference on Science and Technology Indicators (STI Conference 2016)*, València (Spain), September 14-16, 2016 2016. Berlin: European Network of Indicator Designers (ENID).
 24. Shenavar A, Doulani A. Review of Iranian Journal Articles Indexed in Web of Science Based on Altmetric Indicators in Scientific Social Media. *Webology*. 2020;17(1).
 25. Moral-Munoz JA, Cobo MJ. Measuring the online attention of the Rehabilitation Web of Science category: An Altmetrics-based analysis. In *STI 2018 Conference Proceedings*. 2018;677-84. Centre for Science and Technology Studies (CWTS).
 26. Pooladian A, Borrego Á. Twenty years of readership of library and information science literature under Mendeley's microscope. *Performance measurement and metrics*. 2017.
 27. Xia F, Su X, Wang W, Zhang C, Ning Z, Lee I. Bibliographic analysis of Nature based on Twitter and Facebook altmetrics data. *PLoS One*. 2016;11(12):e0165997.
 28. Haustein S, Peters I, Sugimoto CR, Thelwall M, Larivière V. Tweeting biomedicine: An analysis of tweets and citations in the biomedical literature. *Journal of the Association for Information Science and Technology*. 2014;65(4):656-69.
 29. Piwowar H. Value all research products. *Nature*. 2013;493(7431):159-.
 30. Li X, Thelwall M, Giustini D. Validating online reference managers for scholarly impact measurement. *Scientometrics*. 2012;91(2):461-71.
 31. Palmatier RW, Houston MB, Hullah J. Review articles: Purpose, process, and structure. *Journal of the Academy of Marketing Science*. 2018;46(1):1-5.
 32. Eysenbach G. Can tweets predict citations? Metrics of social impact based on Twitter and correlation with traditional metrics of scientific impact. *Journal of Medical Internet Research*. 2011;13(4):e2012.
 33. Mohammadi E, Thelwall M, Kousha K. Can Mendeley bookmarks reflect readership? A survey of user motivations. *Journal of the Association for Information Science and Technology*. 2016;67(5):1198-209.