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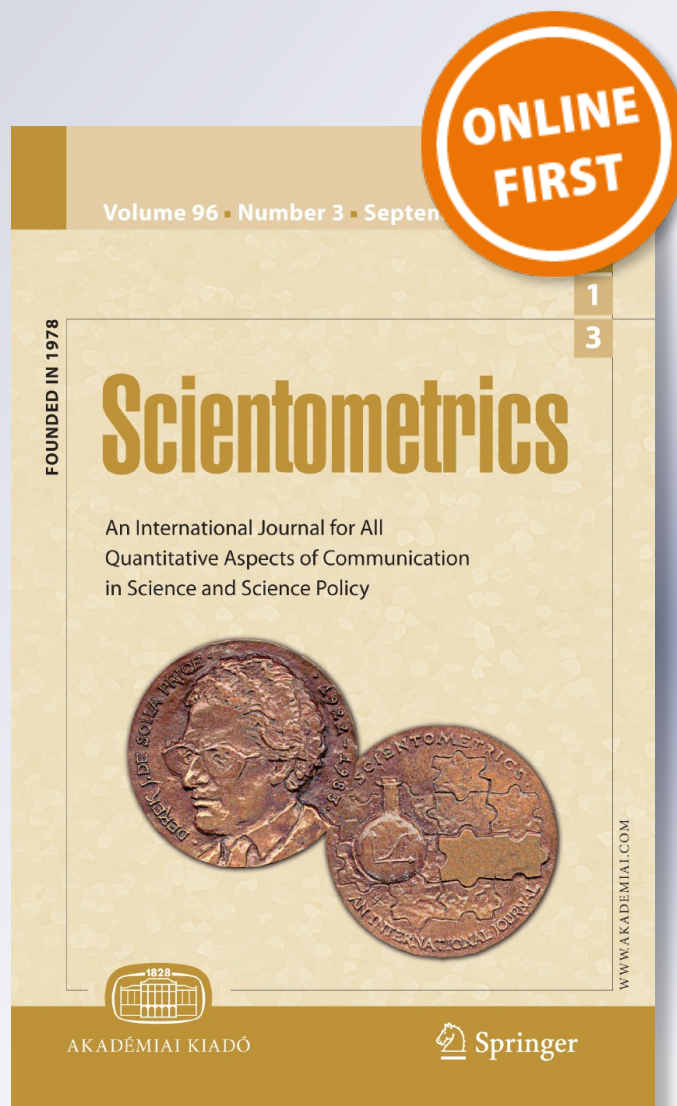
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The effect of characteristics of title on citation rates of articles

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Abstract This study aimed to assess the association between some features of articles title and number of citations in a volume of Addictive Behavior journal. All research articles published in the volume number 32 (2007) in the Addictive Behaviors journal ($n = 302$) were analyzed by two independent authors. For each article, the following information has been extracted: number of citations up to June 2013 in the Scopus citation database, type of and characteristics of titles, having different words in the keywords, reference to place and presence of an acronym. The summary statistics showed that mean number of citation was 16.36 ± 19.55 times. Articles with combinational title (use of a hyphen or a colon separating different ideas within a sentence) and articles with different words in the keywords (at least two different keywords) had higher number of citations. The number of citations was not correlated with the number of words in the title ($r = 0.05$, $P = 0.325$). Our results suggested that some features in the paper such as type of the title and articles with keywords different from words included in the title can help to predict the number of citation counts. These findings can be used by authors and reviewers in order to maximize the impact of articles. The length of title is not associated with citation counts. Therefore, the guide for authors of journals can be more flexible regarding the length of the title.

Keywords Scopus · Attractive title · Word count · Impact of article ·
Type of title · Citation

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Introduction

The number of citations for an article depends on many factors such as subject of the paper, importance of its results, publication type and availability and reputation of the journal in which it is published. The title is one of the most important parts of the article because it is the first contact that reviewers and readers have with the paper.

A limited number of studies have been carried out to evaluate the impact of some features in the title of articles on their citations counts. The results of these studies are inconsistent. Paiva et al. (2012) showed that, short-titled articles had higher citation rates than those with longer titles, and titles containing a question mark, containing a reference to a specific geographical region, and titles that used a colon or a hyphen were associated with a lower number of citations. While, Habibzadeh and Yadollahie (2010) concluded that longer titles seem to be associated with higher citation rates. Another study showed that the number of citations was positively correlated with the length of the title, the presence of a colon in the title, and the presence of an acronym (Jacques and Sebire 2010). In this study, we aimed to examine the association between some features of articles title and number of citations in a volume of a scientific journal, *Addictive Behavior*.

Methods

All research articles in the 2007 volume (32) of *Addictive Behaviors* journal were analyzed. *Addictive Behaviors* is an international, peer-reviewed scientific journal publishing human research on substance abuse. The 2012 impact factor of this journal is 2.021 in Thomson Reuters' journal citation report (JCR). The reason for selecting this journal was its internationality and a sizable number of articles in a volume. A pre-defined form was used to collect the title of article features. The following information was collected for each article: number of citation up to June 2013 in the Scopus citation database, type of the article (i.e. review, original or short communication) and characteristics of titles including type of the title, having different words in the keywords other than the words in the title (at least two different keywords), reference to the place of study (city, state, and country) and presence of an acronym. Type of titles were classified as nominal, combinational (i.e. use of a hyphen or colon separating different ideas within a sentence), question (use of question mark) and complete sentence. Authors independently analyzed the titles and in the case of disagreements, the authors tried to reach a final consensus. The distribution of number of citations was checked by Shapiro–Wilk test and the result indicated that it is not normally distributed ($P < 0.001$). For statistical analysis, Mann–Whitney U, Kruskal–Wallis and Spearman correlation were used in the SPSS-16 software.

Results

The total number of published articles in 2007 in the *Addictive Behaviors* journal was 302. Based on the Scopus citation database, the mean number of citation for the articles up to June 2013 was 16.36 ± 19.55 (percentiles: 25 = 6; 50 = 11 and 75 = 20). Comparison of the mean of citation by title characteristics and article type were presented in Table 1. As reported in the table, articles with combinational title and articles with different words in the keywords had higher number of citations.

Table 1 Comparison of the mean of citation by title characteristics and article type in the 2007 volume of Addictive Behaviors journal

Title characteristics	<i>N</i>	%	Mean (SD)	<i>P</i> value
Type of title				
Nominal	178	58.9	13.94 ± 13.13	0.043
Combinational	96	31.8	21.28 ± 27.80	
Question	22	7.3	12.64 ± 9.14	
Complete sentence	6	2.0	23.00 ± 32.78	
Total	302	100	16.36 ± 19.55	
Different words in the keywords				
No	102	33.8	11.38 ± 9.10	0.002
Yes	200	66.2	18.90 ± 22.73	
Reference to place				
No	260	86.1	16.96 ± 20.60	0.262
Yes	42	13.9	12.64 ± 10.37	
Presence of an acronym				
No	285	94.4	16.44 ± 20.03	0.335
Yes	17	5.6	15.06 ± 8.27	
Type of article				
Review	4	1.3	102.75 ± 89.46	<0.001
Original (full)	185	61.3	18.22 ± 16.21	
Short communication	113	37.4	10.27 ± 8.46	

The results showed that the number of citations was not correlated with the number of words in the title ($r = 0.05$, $P = 0.325$). Also, the number of words in the title was similar in articles with and without different words in the keywords (12.88 ± 3.88 vs. 13.31 ± 4.17 , $P = 0.331$). The numbers of words in the title in review, original and short communication articles were 10.25 ± 1.71 , 13.01 ± 3.87 and 13.16 ± 4.18 , respectively, which is statistically not significant ($P = 0.227$).

Discussion

Journal editors and experienced authors suggest an attractive, simple, understandable, concise, and informative title for articles (Neill 2007; Vintzileos and Ananth 2010). Even some scientific journals impose a maximum limit on the word count for titles. The rationale for this suggestion is that, short title might be more attractive to readers and longer title could be seen as complex and/or boring (Vintzileos and Ananth 2010). Paiva et al. (2012) demonstrated that short-titled articles had higher citation rates than those with longer titles. Habibzadeh and Yadollahie (2010) and Jacques and Sebire (2010), on the other hand, showed that longer titles had higher citation rates. Surprisingly our results showed that the length of the title is not associated with citation counts. Majority of the article searches are restricted to title or keywords. Thus, titles containing more words have a higher chance of being found. In contrast, articles with shorter title are viewed more often (Paiva et al. 2012). Therefore, we think simplicity of the title and being understandable and informative is important.

The results of our study showed that review articles and original articles have more citation than short communication articles. If number of words in the title of an article varies by the article type, then type of the article can confound the relationship between length of title and citations counts. The results, however, showed that this relationship was not confounded by type of the article since the average numbers of words in review, original and short communication articles were similar.

In combinational titles (separated with a colon or a hyphen), the second part of the title usually implies to study design, an especial analysis, or a famous study name. In the most cases, adding the second part of title is an advantage for the title which referring to it can increase the chance of acceptance and citation numbers. Our findings also showed that the mean number of citations of combinational title were more than others. This finding is similar with the results of the previous study by Jacques and Sebire (2010). This result does not necessary mean that adding colon or hyphen can increase the number of citations.

Based on our results, higher citation rates are associated with having at least two keywords other than the words used in the title. Having keywords other than the words in the title can increase the chance of finding and reading of the article and as the results increases the number of citations. Similar results also were found in a study by Jacques and Sebire (2010).

It may be that articles with long title compared to short title ones have lower chance to use different keywords in the paper due to higher number of relevant words in the title. To check this possibility, we compared the average number of words in two groups of articles with and without different keywords. The results showed that having different keywords is not related to the length of the title. This might be explained by the fact that the authors with higher cited articles used different keywords from what they included in the title which, in turn, increased their articles chance to be found in article search results.

In conclusion, some feature in the paper such as type of the title and articles with keywords different from words included in the title can help to predict the number of article citation counts. These findings can be used to maximize the impact of articles by authors and reviewers. Our study demonstrated that the length of title is not associated with citation counts. Thus, the guide for authors of journals can be more flexible regarding the length of the title. Nevertheless, more studies, specially with higher sample size, are required in order to generalize the findings of our study.

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