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Are Shorter Article Titles More Attractive for Citations? Cross-sectional Study of 22 Scientific Journals

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Aim To investigate the correlation between the length of the title of a scientific article and the number of citations it receives, in view of the common editorial call for shorter titles.

Methods Title and the number of citations to all articles published in 2005 in 22 arbitrarily chosen English-language journals (n = 9031) were retrieved from citation database *Scopus*. The 2008 journal impact factors of these 22 journals were also retrieved from Thomson Reuters' Journal Citation Report (JCR). Assuming the article title length as the independent variable, and the number of citations to the article as the dependent variable, a linear regression model was applied.

Results The slope of the regression line for some journals (n = 6, when titles were measured in characters but 7 when titles were measured in words) was negative – none was significantly different from 0. The overall slope for all journals was 0.140 (when titles were measured in characters) and 0.778 (when titles were measured in words), which is significantly different from 0 ($P < 0.001$, t test). Overall, articles with longer titles received more citations – Spearman $\rho = 0.266$ – when titles were measured in characters, and $\rho = 0.244$ when titles were measured in words ($P < 0.001$). This association was found for 7 of 8 journals with impact factor >10 and for 2 out of 14 journals with impact factor <10 ($P < 0.001$, Fisher exact test).

Conclusion Longer titles seem to be associated with higher citation rates. This association is more pronounced for journals with high impact factors. Editors who insist on brief and concise titles should perhaps update the guidelines for authors of their journals and have more flexibility regarding the length of the title.

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One of the most important responsibilities of editors is to improve the quality of the accepted articles before publication in the journal. To increase the quality of articles, they usually give some advice on how to present data and how to arrange different parts of the manuscript. Some of the advice can be found in the information for authors.

One of the most important parts of a manuscript is its title. Writing a title for a scientific article is a challenging exercise (1) particularly regarding its length. Journal editors usually give advice that the titles of articles should be concise (2-6). As an example, the information for authors of the *Archives of Perinatal Medicine* reads "Title of the article should be concise yet informative," (6) and the *Annals of Internal Medicine* suggests that authors "use titles that stimulate interest, are easy to read and concise (12 words or fewer), and contain enough information to convey the essence of the article" (4). If the advice of editors regarding the conciseness of article titles is correct, it could result in greater clarity of the message and greater attractiveness for the readers. The articles with shorter titles would then receive more attention and be used more often, and thus receive more citations. Since we could not find any evidence supporting this assertion, we conducted this study to look at whether there was any correlation between the length of the title of a scientific article and the number of citations it receives.

METHODS

In a cross-sectional study, we retrieved the title and the number of citations to all articles published in 2005 in 22 English-language journals indexed in the citation database *Scopus®*. The search query for the Croatian Medical Journal (*CMJ*), as an example, was: SRCTITLE(Croatian Medical Journal) AND DOCTYPE(ar) AND PUBYEAR IS 2005 AND LIMIT-TO(EXACTSRCTITLE, "Croatian Medical Journal"). The document type we searched for was article – "ar" according to the *Scopus®* classification. Other types of documents were excluded: "ab" for Abstract Report, "ip" for Article in Press, "bk" for Book, "bz" for Business Article, "cp" for Conference Paper, "cr" for Conference Review, "ed" for Editorial, "er" for Erratum, "le" for Letter, "no" for Note, "pr" for Press Release, "rp" for Report, "re" for Review and "sh" for Short Survey (7).

The studied journals included a convenience sample of 15 general medical journals (eg, *New England Journal of Medicine, Lancet, JAMA, British Medical Journal, CMJ*) with high, medium, and low journal impact factors (JIF) as reported by the Journal Citation Report (JCR) 2008 database, Thomson Reuters® (formerly, ISI); 2 specialty clinical journals; 2 basic science journals, and multidisciplinary journals *Nature, Science,* and *Cell* (Table 1).

Using linear regression analysis, the slope of the regression line was determined, assuming the article title length (in characters including spaces, and in words) as the independent variable, and the number of citations to that article as the dependent variable. For controlling the confounders such as changes in the editorial work quality and peer review process in a certain journal, only articles published in a single year were included in the study. All data were retrieved within 3 hours on February 10, 2009, to minimize the change in the number of citations over time. The hypothesis was tested separately for journals with high (>10) and low (<10) JIF. Statistics were presented as median and interquartile range (IQR). All the analyses were performed by SPSS for Windows, version 16 (SPSS, Chicago, IL, USA) for the data retrieved from each journal and for the pooled data from all journals.

RESULTS

A total of 9031 articles retrieved from 22 journals were analyzed (Table 1). Of these 22 journals, 12 were from the US, 5 from the UK, and 5 from other countries (Table 1). The studied journals had a JIF ranging from a minimum of 0.352 (*Irish Journal of Medical Sciences*) to a maximum of 50.017 (*New England Journal of Medicine*) with a median of 4.717 (IQR, 26.246). The number of articles varied from a minimum of 30 for *Medicine* to a maximum of 1731 for *Journal of Immunology*. The median of article title length was 87 (IQR, 50) (range, 4 to 313) characters (including spaces) and 12 (IQR, 6) (range, 1 to 43) words. There was an expected high correlation between the length of titles in characters and number of words (Spearman $\rho = 0.943$, $P < 0.001$). The median number of characters per word in article titles was 7.4 (IQR, 1.437). The number of citations to each article varied from 0 to 1576, with a median of 25 (IQR, 53).

The slope of the regression line for the length of the article title in characters and the received number of citations varied from a minimum of -0.127 ($P = 0.093$) for *Journal of Molecular Biology* to a maximum of 2.476 ($P < 0.001$) for *New England Journal of Medicine* (Figure 1). The respective values were -1.018 ($P = 0.058$) and 13.360 ($P < 0.001$) when titles were measured in words (Table 1). The slope for some journals (n = 6, when titles were measured in characters but 7 when titles were measured in words) was negative, but

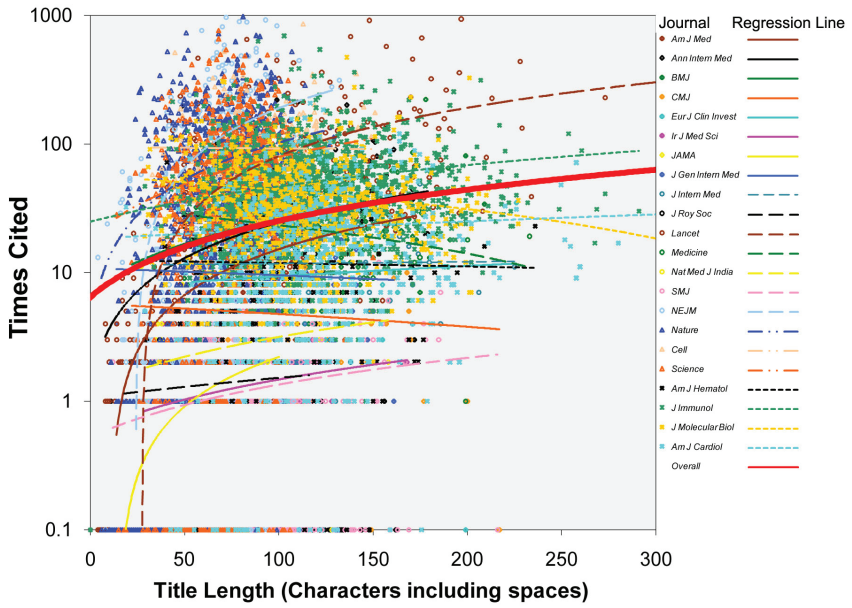
TABLE 1. Characteristics of the titles in 22 journals included in the study. Title length and the relevant statistical analyses are presented in both characters and words.

Journal title	Journal Impact Factor (2008)	Country	Number of articles	Median (IQR*) title length	Median (IQR) number of citations	Slope of the regression line	*P* value†
American Journal of Medicine	5.105	US	186	85 (45.25) C‡	7 (14.25)	0.170	<0.001
				11 (5) W§		1.337	<0.001
Annals of Internal Medicine	17.457	US	184	94.5 (47.5) C	0.5 (35)	0.233	0.003
				12.5 (5.75) W		1.563	0.010
British Medical Journal	12.827	England	263	104 (49) C	21 (23)	0.182	<0.001
				15 (6) W		1.152	0.003
Croatian Medical Journal	1.114	Croatia	101	99 (48) C	3 (7)	-0.010	0.424
				13 (7) W		-0.089	0.361
European Journal of Clinical Investigation	2.784	Germany	91	94 (42) C	7 (10)	0.019	0.491
				12 (6) W		0.128	0.549
Irish Journal of Medical Sciences	0.352	Ireland	49	84 (36) C	1 (2)	0.009	0.220
				11 (5.5) W		0.071	0.194
Journal of the American Medical Association	31.718	US	415	68 (62) C	22 (67)	0.898	<0.001
				9 (7) W		6.211	<0.001
Journal of General Internal Medicine	2.720	US	125	90 (35.5) C	8 (11)	-0.004	0.892
				13 (4) W		-0.112	0.613
Journal of Internal Medicine	5.412	England	89	111 (49.5) C	8 (12)	0.003	0.930
				15 (7) W		-0.060	0.822
Journal of the Royal Society of Medicine	1.356	England	84	47 (35.25) C	1 (2)	0.005	0.729
				6 (4) W		0.005	0.956
Lancet	28.409	England	513	56 (71.5) C	5 (50)	1.110	<0.001
				8 (9)		8.870	<0.001
Medicine	4.329	US	30	101 (61.5) C	14.5 (22.75)	-0.093	0.180
				13 (7.25) W		-0.557	0.298
National Medical Journal of India	0.911	India	45	84 (42) C	1 (4.5)	0.019	0.342
				10 (5) W		0.193	0.181
Saudi Medical Journal	0.396	Saudi Arabia	413	79 (47) C	0 (2)	0.008	0.004
				11 (6) W		0.062	0.004
New England Journal of Medicine	50.017	US	487	65 (31) C	8 (107)	2.476	<0.001
				9 (4) W		13.360	<0.001
Nature	31.434	England	1289	66 (38) C	38 (77)	0.991	<0.001
				9 (5) W		5.862	<0.001
Cell	31.253	US	279	96 (37) C	66 (68)	-0.023	0.917
				13 (5) W		-0.232	0.884
Science	28.103	US	1030	75 (25.25) C	43 (62.25)	0.616	<0.001
				10 (4) W		2.605	0.004
American Journal of Hematology	2.126	US	161	104(50.5) C	8 (10.5)	-0.007	0.788
				13 (6.5) W		0.006	0.974
Journal of Immunology	6.000	US	1731	114 (48) C	40 (42)	0.016	0.628
				15 (6) W		-0.133	0.592
Journal of Molecular Biology	4.146	US	891	105 (46) C	29 (30)	-0.127	0.093
				14 (7) W		-1.018	0.058
American Journal of Cardiology	3.905	US	575	114 (48) C	14 (22)	0.033	0.233
				15 (6) W		0.259	0.238
Overall	—	—	9031	87 (50) C	25 (53)	0.140	<0.001
				12 (6) W		0.778	<0.001

*Interquartile range.
†Slope different from zero.
‡Characters including spaces.
§Words.

not significantly different from 0 (Table 1), indicating that articles with shorter title did not receive significantly more citations than those with a longer title. The overall slope for all journals (Figure 1; solid red line in web-extra Figure) was 0.140 when titles were measured in characters, and 0.778 when titles were measured in words – significantly different from 0 ($P < 0.001$). Overall, articles with longer titles received more citations –Spearman $\rho = 0.266$ when titles were measured in characters, and $\rho = 0.244$ when titles were measured in words ($P < 0.001$).

Figure 1.



Number of citations to original articles published in 22 journals as a function of their title length. The ordinate has a logarithmic scale.

We also analyzed journals with different JIF, a measure of journal influence (8). Overall, compared with those with low JIF, journals with high JIF received more citations (Spearman $\rho = 0.226$, $P < 0.001$) but had shorter article titles (Spearman $\rho = -0.386$, $P < 0.001$). The median article title length was 73 (IQR, 40) characters (10 [IQR, 5] words) for journals with JIF>10 and 105 (IQR, 49) characters (14 [IQR, 6] words) for journals with JIF<10 (Mann-Whitney U test, $P < 0.001$). The median number of citations articles received was 32 (IQR, 74) for journals with JIF>10 and 21 (IQR, 37) for those with JIF<10 (Mann-Whitney U test: $Z = -9.949$, $P < 0.001$).

The journals with a significant positive correlation between the length of the title and the number of citations the article received (n = 9) had a median JIF of 28.103 (IQR, 22.610) (range, 0.396 to 50.017), whereas journals which did not have a significant correlation (n = 13) had a median JIF of 2.784 (IQR, 3.636) (range, 0.352 to 31.253) (Mann-Whitney U test: $Z = -2.638$, $P = 0.007$). On the other hand, while article title length had a significant positive correlation with the number of citations to the articles published in 7 of 8 journals with JIF>10, the correlation was found for only 2 of 14 journals with JIF<10 (Fisher exact test, $P = 0.0015$).

The median of title length was 93 (IQR, 48) characters (13 [IQR, 6] words) for the US-based journals and 70 (IQR, 46) characters (9.5 [IQR, 7] words) for UK-based journals (Mann-Whitney U test, $P < 0.001$). Journals published in the US received a median citations of 30 (IQR, 50) while those published in the UK received a median of 23 (IQR, 62) citations (Mann-Whitney U test: $Z = -7.108$, $P < 0.001$). Here again, articles with longer titles received more citations regardless where they were published – in journals from the US (Spearman $\rho = 0.163$, $P < 0.001$) or UK (Spearman $\rho = 0.495$, $P < 0.001$). The association between the title length and the number of citations was also found for the remaining journals published in 5 non-US non-UK countries (Spearman $\rho = 0.216$, $P < 0.001$).

DISCUSSION

Our study demonstrated that journal articles with longer titles were more likely to receive citations. For all 22 studied journals in the study, shorter titles did not receive significantly more citations than longer titles.

Although different scientometrics have been proposed for measuring the influence and quality of a journal (9), JIF is among the most acceptable and best available metrics to reflect the quality of a journal. Title of articles from journals with high JIF was significantly shorter than of those from journals with low JIF. This is contrary to the expectations,

as we postulated that journals with higher JIF would have longer titles because they would presumably include the description of study design (eg, randomized clinical trials). The positive correlation between the article title length and the number of citations received, nonetheless was found for most of the high JIF journals studied.

We observed significantly longer titles in US than in UK journals. Since most of the journals in this study were from the US, and since articles from US journals cite other US journals more often than articles from European journals (10), our results showing that longer titles (which are more common in US journals) receive higher citations could be biased and influenced by this citation behavior. However, the association between the article title length and the number of citations that the article received was found for US, UK, and non-US/non-UK journals. The association was not only found for biomedical journals but also for non-medical journals like *Nature* and *Science*.

The present study showed that articles with longer titles obtained more citations. We think that longer titles are mainly those which include the study methodology and/or results in more detail and thus, attract more attention and citations. This hypothesis, however, should be tested by doing content analysis of the titles to understand what makes them longer: information on methods, study design, results, or other types of style or content characteristics.

We also found that journals with significant positive correlation between the length of their article titles and the number of citations had a significantly higher JIF than those without it. Of 8 journals with JIF>10, only one did not show a positive correlation between the title length and number of citations.

One limitation of our study was that we measured the number of citations as a function of title length while the number of citations to an article is a multifactorial variable and depends on different factors, including the journal where the article was published, the science discipline of the journal, *etc* (11). Nevertheless, we showed that shorter titles did not receive significantly more citations than longer titles, regardless of the scientific discipline the journal belonged to (eg, clinical or basic science).

Another limitation of our study was that we measured the title length of articles after their publication. That means that the editors had already made some modifications on them including their titles (12).

Although we expect that using either a very short or a very long title is a poor practice, and that there should be an optimal title length that would receive the highest citations, we could not observe such a ceiling effect.

The concept of evidence-based medicine developed in the 1980s (13), soon found its way to medical disciplines, so that there are even propositions for evidence-based medical writing (14). Editors try to publish articles in the best form for presenting data and communicating the research message, and provide advice from their own experience, common sense or other editors. Many of these pieces of advice, however, are not based on solid evidence, including the one on the length and conciseness of the article titles.

Stephen Lock, the former editor of the *British Medical Journal,* coined the term "journalology" to describe application of bibliometrics to journals evaluation (15). We think this is the time to rely on the current body of evidence and switch from an eminence-based to an evidence-based writing – hence, to coin the term "evidence-based journalology." We showed that articles with longer titles are associated with more citations. Thus, editors who insist on brief and concise titles should perhaps update the guidelines for authors of their journals and have more flexibility regarding the length of the title. Authors, on the other hand, should critically assess the editor's requirement for concise and brief titles and rather write titles that best communicate the results of the research presented in the article.

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