

The Growth of Sleep Science and the Role of *SLEEP*

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Editor in Chief

SLEEP publishes the full breadth of original science discoveries related to all aspects of the topic. Articles are submitted to the journal from around the world, and they include scientific investigations of the fundamental biology of sleep and wakefulness in animals and humans, translational science, experiments on the effects of sleep and sleep loss on physiological and behavioral functions, circadian control of sleep and wakefulness, sleep across the lifespan, sleep disorders, intervention studies and clinical trials, population science, and investigations that inform public health and safety policies. The goal of the journal is to present the most important, valid and reliable scientific evidence on the mechanisms, functions and benefits of healthy sleep, as defined by optimal sleep timing, continuity, intensity, quality and duration, both acutely and chronically, at each stage of life.

In this issue of *SLEEP*, Daniel Buysse provides a thought-provoking “perspective” that a mounting body of scientific evidence supports the view that good sleep is essential to good health,¹ which includes effective and safe behaviors. Dr. Buysse proposes that it is time to actively champion the concept of “sleep health” in research, clinical, and regulatory environments. His proposal is supported by a large and continuously growing body of science, especially over the past 10 years, that derives from all of the various types of scientific paradigms listed above.

Evidence of the growth of sleep science supporting Dr. Buysse’s perspective is conspicuous. From 2007, my first full year as Editor of *SLEEP*, to 2012, original science submissions (excludes review articles, case reports, editorials, and abstracts) to *SLEEP* have more than doubled. During the same 6-year period the total number of original science articles published with “sleep” as a keyword increased by approximately 50% worldwide (see footnote A). The global increase in original science articles with “sleep” as a keyword for the 10-year period from 2003 through 2012 was 101% (i.e., a doubling), to a total of 6,081 scientific articles related to some aspect of sleep being published in 2012. Not surprisingly, during this 10-year period, the number of scientific journals with “sleep” in the title also more than doubled worldwide. At the same time, original science articles on sleep have appeared with increasing frequency in journals focused more broadly on biological rhythms, cardiovascular functions, neuroscience, and respiration, among other areas. While journals in these latter categories rarely have more than 10% of their published articles identified with “sleep” as a key word, biological rhythm journals often have 20-50% of their papers relevant to sleep, and journals with “sleep” in the title, not surprisingly, have virtually all of their published papers relevant to some aspect of sleep. During the past 10 years, high-impact general science and medical journals, e.g. *Cell*, *Current Biology*, *JAMA*, *Lancet*, *Nature*, *PNAS*, *Science*, have also increased the publication of original science on sleep.

SLEEP has made important contributions to this growth of sleep science by publishing the largest number of original science papers on “sleep” of any scientific journal; by having its published papers cited more than the combined total of all other “sleep” journals; and by publishing many high-impact scientific reports. The journal’s annual impact factor has been above 5.0 for the past 4 years, and its 5-year impact factor reached a high of 6.175 in 2012, which was higher than 95% of the 8,471 listed journals. Consistent with these metrics, the most recent h5-index of “Top publications - Circadian Rhythms and Sleep” gave *SLEEP* the highest score (62) according to Google Scholar Metrics. All of these impact indices indicate *SLEEP* is increasing the visibility of the original science it publishes to the broader scientific and medical communities.

One important way to increase visibility is to publish articles that are viewed as important by the broader scientific community, and therefore, cited frequently. Between 2007 and 2012, *SLEEP* published 984 original science papers out of the global total of 30,501 original science reports worldwide with “sleep” as a key word (see footnote B). Therefore the journal contributed a modest 3.22% of the original science papers related to the topic of sleep that were published in that 6-year period. However, during this 6-year period, original science articles published in *SLEEP* were cited a total of 18,545 times, which is more than the combined sum of citations to original science articles from all of the other six journals with “sleep” in the title and listed in Web of KnowledgeSM. Original science articles in *SLEEP* accounted for the highest proportion (i.e., 10%) of papers published and cited ≥ 100 times (see footnote B) in the period from 2007 through 2012. A total of $N = 18$ papers appearing in *SLEEP* out of a grand total of $N = 181$ “sleep” papers that were published in all journals between 2007 and 2012, were cited 100 times or more in the same period. The second and third highest contributors to these highly-cited sleep papers in the same 6-year period were *Proceedings of The National Academy of Sciences of The United States of America* ($N = 14$), and *Science* ($N = 9$), which are two of the top three most cited journals in the world. When conducting the same analyses for the 10-year period from 2003-2013, *SLEEP* again published the most highly-cited (≥ 100 times) original sleep science papers ($N = 71$) relative to all other journals (see footnote A).

The continued contributions of *SLEEP* relative to the above indices of original science impact is due to the many excellent scientific submissions the journal receives, the superb judgments of the Deputy and Associate Editors handling manuscripts, the diligence and work of the Editorial Board and many other reviewers, and the journal’s managing staff who consistently produce highly-quality issues. This excellence is also contributed to by the many changes *SLEEP* has made over the past 6 years to attract the best original science from around the world, and make the journal more accessible to all, as well as to

ensure the journal continues to uphold the highest ethical standards of science reporting. If we are to fully realize Dr. Buysse's call to arms regarding "sleep health," we must continue to publish the best and most impactful science from all areas of sleep research and sleep medicine, and to improve the attractiveness and accessibility of the journal for scientists seeking to rapidly publish important original work, and to transition those discoveries to other scientists, the public, clinical practitioners, and policy makers. The international growth of original sleep science over the past 10 years has provided an unprecedented opportunity for conveying the value of discovery of the mechanisms and functions of sleep and their contributions to health, safety and quality of life.

FOOTNOTES

A. ISI Web of KnowledgeSM Journal Citation Reports® search in JCR Science Edition.

B. Thompson Reuters Web of KnowledgeSM Web of Science® search on "Topic = sleep" AND "Year Published = (2007-2012)".

CITATION

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REFERENCES

1. Buysse DJ. Sleep health: can we define it? Does it matter? *Sleep* 2014;37:9-17.