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## EDITORIAL

# Underreporting of scientific knowledge: a theme for reflection

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The public records of knowledge is usually performed by full papers in scientific journals, because they are the center for communication system in science and the most highly regarded and comprehensive means of dissemination of scientific knowledge. Published articles also allow the institutionalized control of knowledge, since the publication only occurs after a peer review process. In addition, after the publication of the article, a new arbitration by peers initiates, much more boarder, consistent and definitive, that is that performed by the scientific community, called post-publication peer review. If the researcher's contribution has been relevant, it will survive and its incorporation in the scientific literature will be expanded, through the citation by other authors[1].

One issue that has been the subject of increasing study is the underreporting of scientific knowledge, also referred to as invisible scientific production[2], defined as the non-publication of full papers of completed research projects, even after they have been presented and published as abstracts at scientific congresses. Approximately 46% to 52% of research projects involving clinical trials approved by the Research Ethics Committee in different institutions of different countries are not published as complete articles after they have been completed[3, 4]. The factors responsible for higher publication rates were presence of positive or statistically significant results, institution status, international collaboration, large samples, and project financing.

A similar phenomenon seems to occur in many postgraduate programs in Brazil, where considerable number of master dissertations and doctoral theses do not have their results published as full papers in scientific journals. In this case, they will be read almost exclusively by members of the examination board and later archived in the library of program's home institution, where they are available for online consultation on the digital libraries and scientific repositories of universities and on theses database of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) (Higher Education Personnel Training Coordination), which are filed with the dissertations and theses published from 1987.

Apparently, there are only two studies on this issue. The analysis of master dissertations and doctoral theses of post graduate program in Medicine at the Universidade de São Paulo (USP), completed in 2003, showed that from 495 master's dissertations and doctoral theses completed in that year, only 229 (46,3%) were published as full papers between the 2003 and 2006 (until August of this last year) in journals indexed in the database of US National Library of Medicine National Institutes of Health (PubMed), Scientific Electronic Library Online (SciELO) and/or Literatura Latino-Americana e do Caribe em Ciências da Saúde (LILACS)[1]. The second study refers to dissertations and doctoral theses produced by the post graduate program of the Instituto de Pesquisas Energéticas e Nucleares (IPEN), linked to USP, during the period of 1982-2009. According to the indicators obtained from 401 doctoral theses completed within that period, registered on the database of IPEN library, 55.9% of complete papers published by IPEN and indexed in the Web of Science database, in the period of five years before and five years after the conclusion of the theses, have strong correlation with them, i.e., they are originated or resulted in the completion of the doctoral theses[5].

These data show that about half of the studies, originally developed as master dissertation and doctoral thesis in Brazilian prestigious reputation institutions, were not subsequently published as full papers in scientific journals indexed in the main international and national databases. Both studies show that most of the articles written based on the results of the master dissertation and doctoral thesis was published in the first two years after the conclusion of the study.

The most common and studied scientific knowledge underreporting example is the one that happens when a search is completed and presented to any official public event, but is not subsequently published as a full article in a scientific journal. Therefore, falls within the underreporting situation, the research divulged only in scientific congresses, as oral or poster presentation, and published as

abstracts in annals of congress and in supplements or regular fascicles of journals. Research summaries have reduced content, without the detail required on materials and methods, results, and discussion, also missing illustrations and references, making it difficult for other researchers to reproduce and validate the results. Moreover, they are often excluded from databases and, therefore, rarely consulted, restricting their power to disseminate scientific knowledge and potentially causing duplicate studies.

The relevance of the subject may be proven by the number of articles published about it. According to PubMed and SciELO database, in the period 1993-2015, at least 130 papers addressing the number of complete articles published generated from abstracts presented at scientific congresses were published. The average rate of publication of full papers is 44.5% from the abstracts previously presented[6]. There are several reasons for not later publication of the abstract, the main are the presence of negative or incomplete results, small sample size, lack of time and/or interests of authors to write the manuscript or resources to submit it for publication, change priority, and rejection of the manuscript submitted for publication. Although the presence of negative results may influence the decision of the author not to submit the study for publication, negative results in the manuscripts submitted for publication do not seem to influence the editor's decision-making as for the question of publishing it, thus, there was no significant difference in publication rates among manuscripts with positive versus negative results[7]. The time between the abstract publication and the full article publication usually ranges from one to two years.

This issue of the Jornal Brasileiro de Patologia e Medicina Laboratorial (JBPML) brings an original article on underreporting of the knowledge produced in pathology in Brazil, when dimensioning the number of complete articles published and indexed in PubMed and Scielo database in the period of 2012 to January 2015, originally presented as abstracts at the XXVIII Congresso Brasileiro de Patologia and XXVIII Congreso de La Sociedade Latinoamericana de Patologia, held in Maceió, Alagoas, in October 2011[8]. From 701 published abstracts, 63 (8.8%) full papers were originated. This number is higher than some Brazilian medical congresses in other specialties analyzed in similar studies, but lower than the number of full papers (36%) originated from abstracts presented in the United States and Canadian Academy of Pathology annual meetings from 2005 to 2007, published within three years after the meeting[9]. These are the only two articles published in the literature into the whereabouts of abstracts presented at the specialty congresses, besides one at cytopathology specialty[10].

Reflection on the subject is important because underreporting of scientific knowledge is a waste of time and resources in the use of laboratories, equipments, patients, and laboratory animals, apart from financing for the purchase of equipment and consumption material and scholarships research. Another consequence is that the underreporting of a research result may contribute to the creation of an incomplete or biased database, resulting, for example, in overoptimistic evaluations of the benefits and side effects of a drug, which can lead to inappropriate recommendations or even risks to patients.

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