The quality of a scientific publication is the product of a sum of efforts and attributes

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Every editor of a medical-scientific publication looks for the journal he/she publishes to have or to be recognized as having quality. Quality is achieved with the participation of a group of professionals (editors, authors, reviewers, printers, designers and even readers), and the results of their professional participation add, during the process, properties intended for the product, a scientific medical publication, to be valued for its quality.

A medical-scientific publication is initially evaluated in terms of quality for its content (the information it contains: Original articles, Reviews, Editorials, Letters to the editor) and in second place, by the way the content is editorially offered (cover and interior design, typography, color, style, among other aspects that are beyond the purposes of this document). In this sense, the first attribute of a medical-scientific publication of quality is that it diffuses valuable or value-containing information. Valuable information is the first input that enters the editorial process of a medical-scientific publication. It is the authors who produce (with the development of medical research) and enter the input when they submit documents (articles) that contain valuable medical information to the peer-review and possible publication editorial process.

What is by valuable medical information understood and how is it obtained?

For operational purposes, valuable medical information can be defined as that which is the result of a research process. Investigators are responsible for generating valuable medical information and, with strict adherence to the scientific method, they seek to answer scientific questions, the solution or answer of which is expected to be a contribution to medical knowledge. The attribute that confers value to medical information resulting from research is the contribution to universal medical knowledge.

When investigators generate this valuable medical information, they share it by its publication for the use and benefit of society. Diffusion is accomplished through its publication as an original article in medical-scientific journals. A quality medical-scientific publication contains a proportion of 50 to 70% of its contents as original articles (valuable information) on average. In addition to diffusing information that contributes to knowledge, the higher the percentage of original articles published in a journal, the greater its appreciation and value will be.

When a doctor or other professional of related disciplines perform medical research we call them investigators, and when they submit the results of their research for publication, we call them authors and co-authors. The end-product of the research process is valuable medical information that makes a contribution to universal medical knowledge and this, in turn, is the main prouct of a quality scientific publication.

Does every medical research result contain valuable information?

In most cases, it does; however, not always, and it is society, through the international medical-scientific community, which is responsible for auditing that the research process is carried out following methodological

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(compliance with the scientific method), ethical and transparency principles with the purpose to provide knowledge by seeking the solution of a real medical-scientific problem and not owing to an individual lack of knowledge. The latter gives rise to pseudo-scientific questions and, hence, to pseudo-investigations and pseudo-contributions to knowledge. This social surveillance is carried out by "peers", by means of research committees, hospitals or research units in integration; i.e. it is renowned investigators who master the scientific method, which is the technical instrument that guides scientific research. Research committees analyze the identified problem and the hypothesis that would explain the possible contribution to knowledge, as well as adherence scientific method during its development. Research committees, after analyzing the research protocol (a document developed to expose what is to be done and how, what is to be measured and what are the possible expected results) and, if appropriate, suggest changes or improvements, grant approval for its development with a registry number.

On the other hand, in hospitals and medical research units there are also ethics committees, the task of which is to ensure that research projects approved for their development are carried out under strict compliance with ethical principles. In both committees (research and ethics), the transparency on the management of resources contributed by benefactors or public institutions is kept under surveillance, as well as the possible presence of conflicts of interests (principle of transparency) that might occur between investigators and providers of financial resources for the research. Once compliance with ethical principles in the research project is guaranteed, it is approved for its development and is registered at the corresponding ethics committee. By regulation, developing medical investigations or granting or receiving financial support is not possible without appropriate approval of the research and ethics committees.

There are professional and non-professional investigators. Professionals seek to build knowledge and, consequently, put it at society's disposition; they are those who have been trained for it by showing abilities in the search and analysis of information, in the proposal of scientific questions, command of the scientific method and application of statistical analyses, and possess written communication skills. Professional investigators have taken diploma courses, medical specialty training and obtained master's degrees and PhDs at research institutions.

Non-professional investigators look to comply with academic requirements, such as carrying out a graduate thesis, medical specialty training or taking a diploma course, and strengthen their CV. They have not been trained as investigators and pose questions by intuition or based on experience from the field of clinic, they consider compliance with the scientific method as the development of a recipe, statistical analysis as the application of a computational tool, and research and ethics committees' approvals as administrative regulations out of unawareness of the social audit role they play. Many of these non-professional investigators, after starting as non-professionals, with the repetition of this practice acquire conscience of the social role of research, identify the need for training and undertake master's degree and sometimes doctorate formal courses.

In general, professional investigators produce information with the attribute of scientific truth, i.e., valuable (original works) and validated medical-scientific information. On most occasions, non-professional investigators produce medical information with questionable or poor scientific value, most times with no real contribution to knowledge and, in the peer-review process, their articles are therefore frequently not approved for publication, which often is discouraging for doing research and publishing.

However, both professional and non-professional investigators seek to publish their articles by submitting them to periodical medical publications. These documents, as previously mentioned, are submitted as original articles (input) to medical journals, which will carry out the editorial peer-review process (sub-process).

What is the peer-review editorial process, what does it serve for and how is it carried out?

The editors of a journal direct the peer-review editorial process to guarantee that the medical-scientific information that is to be published is of value, that it has been developed under strict compliance with the scientific method and ethical principles, with transparency and with the authors' declaration of no conflicts of interests.

The peer-review editorial process consists not only in administering articles submitted for publication. Editorial peer-review is intended to guarantee to the reader that the published article has scientific value. For this purpose, it is aided by experts or peer reviewers, who assess the original works submitted for

publication. The editor must make a list of experts based on the publication's and published articles' characteristics. Reviewers are mainly selected for their professionalism and expert status, and not based on friendship or convenience ties (conflict of interests between editors and reviewers). During this process, the editors should take care of conflicts of interests that might arise between authors and reviewers.

"Peer" reviewers assess the contribution to knowledge by examining the employed methodology, measurements and applied instrumentations, their results and the performed analysis, its contrast with current state of knowledge, its relevance, its validity and, most important, the place the contribution of the research has in the context of universal knowledge. Written communication skills are also evaluated.

The peer-review editorial process is carried out to endorse and validate and, ultimately, to guarantee that the medical-scientific information to be published is valuable, and it is carried out by express request to three experts on the subject to assess if the original article is of value (content validation by peers); i.e. the peer-review editorial process is based on foreign or external validation about the quality of the information, the degree of contribution to current state of knowledge, its relevance and the opportunity of its publication by advising or suggesting to publish it or not, which finally translates into a "peer-review editorial pronouncement". Many times there is an intermediate point where prior to establishing a final pronouncement, complementary information or explanations are requested, or suggestions are made on improvement or results presentation or analysis in the discussion section. At the end of their assessment, "peer" reviewers suggest an "approved for publication" or "not approved for publication" pronouncement and then list the reasons or arguments they support the pronouncement suggestion with. Contrary to what many authors think, especially non-professional investigators, the decision to publish or not is not a personal ruling of editors. Editors, as the people responsible for editing a publication with quality, are aided and supported by "peer" reviewers to establish a pronouncement with objectivity and adherence to scientific truth. Editors must also avoid any conflict of interests that might emerge by friendship or feud with an author, between authority, rank or subordination relationships, when accepting or not the publishing of a document.

Editors have multiple and different functions, including the following:

- When receiving a document, to verify that the article meets the editorial standards established by the editorial board and the editorial committee. In the case standards are not met, to request their fulfillment from the authors.
- To verify that the subject or research area where it was carried out are consistent with the scope or scientific disciplines of the publication.
- To build a portfolio of reviewers and select among them the most adequate to review each one of the submitted original articles.
- To review the expert opinions and, based on them, issue an editorial pronouncement (approved or not approved for publication), which is sent to the authors with or without suggestions for improvement.
- To integrate the contents of each issue, where approved articles are published seeking internal consistency and sequential logic.
- To request ad hoc editorials, according to the contents, from experts on the subject.
- To receive, review and assign a place to letters to the editor in order to favor active communication between authors and readers. Editors should always inform the author of the commented article in order for him or her to be able to exercise the right of reply or answer the reader's comments with additional explanations.
- To closely participate in editorial care, by verifying that style unification is complied with and by respecting esthetic criteria that favor for the content delivered to readers to be not only of scientific but of esthetic value as well.
- To participate in the selection and location of tables and figures within the contents of an article, in order to establish and preserve an interior design style that harmonizes the what (scientific content) with the how delivered.
- To review preprint proofs and make final corrections.
- To audit the scientific publication production during the entire edition process.
- Additionally, to supervise opportune distribution of the publication among subscribers, and that exchange agreements with libraries, hospitals, medical schools and research institutions are complied with.
- At the end of each edition, to assess and identify problems or deficiencies with the purpose to correct or solve them.
- Finally, in a periodical basis (annually or every six months), to submit face-to-face reports to the

editorial board and editorial committees. They also have to inform the institution or professional association holder of the copyrights.

It is a myth thinking that the quality of a scientific publication depends exclusively on editors. Throughout this manuscript it has been stated that it depends on the basic intake, which is scientific information with intrinsic value, and that this does not improve with editorial care, grammatical corrections or style unification. Valuable scientific information is the result of research, especially when developed by professional investigators, when the research and ethics committees satisfactorily comply with their functions of counseling and sanction, and don't have the sole purpose to register projects.

The quality of a scientific publication requires a good intake (original works) and the fulfillment of the editorial arbitration process by "peer" reviewers who are socially committed with knowledge diffusion by means of the assessment they make of original works. The responsibility to diffuse a contribution to knowledge and not to publish a pseudo-contribution is shared by editors and reviewers. Reviewers' lack of commitment, or tardiness in performing the corresponding review, deteriorates and delays editorial arbitration process, which results in lesser quality of the publication.

Quality measurement of a medical-scientific publication is traditionally made with the impact factor, among others, which is obtained from the ratio of the total number of works published over a 2-year period and the number of citations said documents produce within the first 2 years after their publication. There is a direct relationship between scientific journals that publish larger numbers of original works (70-90% of their content) and that contain great contributions to knowledge and the number of citations they obtain and, therefore, with the impact factor of the publication. With regard to the above, the number of original works with contributions to current knowledge and the number of times they are used as references (citations), are determinant to the quality of a publication. Another argument that supports the above is that the "scientometrics" discipline, to assess scientific productivity and its impact, measures the number of published articles by authors, institutions and countries, and the number of citations their works have accumulated over time. In this argument, we can observe again that the number of citations is determining in the measurement of scientists' productivity, and that these don't depend on the number of published works, but on the contribution their original articles have made to knowledge.

Other attributes of scientific journals that are valued as of quality include expedite and adequate editorial arbitration, with the purpose to avoid obsolescence together with the opportunity for their publication, i.e., that they are diffused on time.

In conclusion, if editors' ultimate purpose is to provide the publication they direct with value, and that this translates into quality, the section of original works that make contributions to knowledge must be broadened. The editorial arbitration process should be strengthened in order to more objectively and consistently identify those works that contain contributions to knowledge, and professionally and responsibly validate them based on "peer" reviewers' evaluation. Editors, and authors themselves, should be aware that the results will be able to be observed and measured on the mid or long-term. Wishing for results in terms of quality on the short-term is difficult and most probably subjective.