Editorial

Medical Practice and Clinical Research: Keys to Generate Knowledge and Improve Healthcare

Carla Martínez Castuera-Gómez, Juan O. Talavera

Medical knowledge that integrates clinical research into routine medical practice may directly impact in the quality of care. In the process of medical knowledge generation are four steps: posing a question related with medical practice, analyzing the knowledge published in specialized literature, developing a research protocol and publishing results. Enabling clinical research-based decisions is essential to favor the development of strategies that increase the quality of care.

Key words: clinical research, healthcare quality, periodic publications

Researching, creating and sharing knowledge are amongst the noblest activities that human beings can engage in, since their goal is invariably to improve the condition of life in general. This generousness is more evident in the field of medicine, since research results determine the quality of life that healthy people, as well as those affected by some disease, will have. Therefore, the importance of research in the medical area lies in its inherent social responsibility.

In view of the latter, this reflection seeks to contribute to the idea that it is possible to assume such responsibility when healthcare staff maintains a symbiotic relationship between medical practice, clinical research activities, and the publication of medical knowledge.

From Clinical Practice to the Generation of Knowledge

The process of medical knowledge generation may improve medical care quality when it begins in medical practice, it is enriched by clinical research and it ends up with its publication.

Medical practice can be understood as the strategy routinely followed by the physician when choosing the best care alternatives —within her means of knowledge and resources— in order to treat a specific health condition. When the physician faces situations that she is not able to solve in the usual way, she reaches the point to start generating medical knowledge.

The first step in this process is taken when the doctor poses a question trying to solve a problem arising from his professional practice, whether trying to establish a diagnosis, estimating the prognosis or deciding the cause of the problem or a better treatment. Questioning is a skill that physicians develop almost naturally. Routine activities like physical examination, history taking or review, prescription of a different drug upon complications or persistence of diseases, among others, involve a questioning. This questioning is followed by the search for causes, comparison of cases, and identification of irregular conditions, in order to make decisions on the best treatment for a certain health condition. Questioning, answering and deciding are inherent tasks to the medical profession, such as the creation of knowledge. When the physician gets involved in academic and research activities in parallel to his professional practice, questioning and assertive decision-making skills are refined and sharpened.

In consequence, physicians who do not engage in research are wasting the opportunity to develop their professional skills and are neglecting their social responsibility by not using their knowledge and capabilities, in order to improve people's quality of life. Moreover, the development of clinical research must be included as a requirement in the design of healthcare systems and, therefore, administrative and medical tasks must exist in order to facilitate its execution.

The next step in the generation of medical knowledge is the search for answers consultating and critically analyzing specialized literature. The importance of this step is that it reduces the risk of investing time and human, financial and physical resources searching for answers to questions already posed, or even worse, ending up with inconclusive answers or answers that have already been proposed. Furthermore, comprehensive and critical review of literature is crucial because it ensures for the manuscript to be original and innovative, with appropriate scientific support and high feasibility estimation. When these factors are contained in a manuscript, it is more likely that it has accurately solved the posed question and that it will be able to turn into publication material, due to the relevance of the generated knowledge.

This step appears to pose two challenges: access to the sources of information and selective search. Actually, the challenge is only one: knowing how to search. Internet and PubMed are powerful sources of readily accessible information to all physicians, but if the use of search parameters is not known, they become an endless reservoir of low quality information that discourages research. For this challenge, a simple solution is proposed: teaching selective search strategies and constantly putting them into practice. This proposal is an aspect in which medical and administrative personnel can influence in order to maintain the *medical practice-clinical research-publication* symbiosis.

The third step in the medical knowledge generation process is to design and execute the clinical research protocol. The development, the contents, the characteristics and the execution of a protocol are widely discussed topics beyond the scope of this reflection, whose central interest is to state that medical knowledge is generated when clinical research is able to propose an answer to a question arising from medical practice. Nevertheless, it is important to emphasize that clinical research and the development of the protocol should follow quality control strategies in order to safeguard both methodological strictness and participating patients. This is achieved with the inclusion and observance of minimum ethical principles. Involvement of ethics committees, international registration of clinical trials, peer reviews and editorial boards counseling are some of the mechanisms to supervise adherence to ethical principles that warrant the development of quality research.

The execution of the research protocol generates an answer to the question. Even though the answer may be different from that what was inferred or expected, there is certainty that it was obtained collecting and testing evidence. Regardless of the answer, the fourth step of the process begins, and the time to select a journal to publish the obtained information.

Currently, there is a trend to select a journal considering mainly its impact factor: "today, too many of our postdocs believe that getting a paper into a prestigious journal is more important to their career than doing the science itself".[1]

However, this decision should be based on the audience to whom the information is directed, the accessibility readiness offered by the journal to medical audiences, publishing requirements, and, ultimately, the impact factor. This order of selection priorities is ideal if the main objective of publishing is to disseminate clinical research results and encourage physicians to integrate them in their daily practice, in order to improve their practice and care.

Moreover, this order of priorities relieves the pressure imposed when trying to get published in a journal with impact factor and supresses frustration when that is not achieved. Although academic systems rely on parameters such as the impact factor for the assessment of scientific productivity, in the local setting, there is the possibility of creating assessment mechanisms and incentives that promote the publication of medical knowledge in prestigious journals that are easily accessible and widely available to the medical community, regardless of the impact factor. In our country, and especially in our Institution, the *Revista Médica del Instituto Mexicano del Seguro Social* is a unique and privileged space that has to be considered in order to encourage publication of medical knowledge.

According to an editorial published in "Proceedings of the National Academy of Sciences," numerous postdoctoral students state that they would choose publishing their academic work in their favorite journals, those in which they find writings they enjoy reading, if they were not assessed based on the impact factor.[1] Moreover, if —as it has been argued— published medical knowledge allows for the best practices to be shared and promoted, then, the selection of the journal to publish should not be defined solely by the impact factor.[2]

Taking this into account, it would seem convenient to promote publication of knowledge resulting from clinical practice research, in readily accessible journals, since this characteristic will favor its application in the medical area. For example, publishing in local

journals increases the likelihood that the reader knows the author and vice versa. This could be an important stimulus to encourage more physicians, who perceive themselves on the same level as the authors, to feel attracted to create and share their knowledge through the process to generate knowledge. Furthermore, physicians who read knowledge published by colleagues may be more likely to integrate it into their own practice if the author is a person they respect, partly because the readers have the possibility of discussing with the author and because they are certain that the author knows the conditions of their medical service or, at least, their local or national circumstances. Such knowledge is perceived with authority and not as an imported recipe that cannot be applied to local circumstances. Selecting this kind of journals reduces the temptation to distort the results or the information in order to get published, contrarily when the publication is sought in a high-impact factor journal.[1]

Finally, if we remember that researching is an act of social responsibility, the selection of the journal for publishing should not be made based on prestige but on the possibility of sharing knowledge. Therefore, promoting the improvement of medical practice is directly related to the promotion of publishing medical knowledge based on clinical research. The more integrated the medical activity into clinical research is, with the resulting publication of the generated medical knowledge, the greater the chances of influencing on medical care improvement will be, thus closing the virtuous circle of knowledge generation.

So far, we have tried to support the argument that the *medical practice-clinical research-publication* relationship has an impact on the quality of medical care. Like other authors, we believe that clinical research by itself has three positive effects:[3-6]

1. Patients who participate in a clinical research project receive better quality of care.
2. The physician's motivation and satisfaction at work increase.
3. Health systems benefit from the efficacy and efficiency shown by both physicians in their practice and patients in their treatment.

However, it is publication and dissemination of clinical research-derived knowledge that assures these benefits will be extended and reproduced by means of the medical practice-clinical research-publication relationship. The described pathway is ideal for maintaining this symbiosis and influencing on the improvement of healthcare. However, unfortunately, this is not the path that is always followed. It is possible, and more often than desirable, to find unoriginal or poorly substantiated and inconclusive clinical research publications, with very low quality control and, sometimes, disregarding relevant ethical principles. The consequences have not been negligible: eroded credibility of some journals; lack of interest in publishing knowledge, generated by clinical research and in conducting research; non-updating of physicians and a tendency to reduce their practice effectiveness; as well as low or non-existent creation of knowledge applicable to the patient's ailments.

Conversely, when the process to generate knowledge originated in clinical practice and clinical research is followed in an orderly manner, a virtuous environment is generated, and it stimulates the medical practice-clinical research-publishing symbiosis. A physician involved in medical care that performs clinical research and crystallizes the process with the publication in journals that are accessible to her colleagues becomes an authority and a role model. Anyone who solves the needs of medical practice through clinical research develops good care habits and makes it easy for this attitude to be reproduced among the healthcare personnel she works with. In summary: an immediate improvement in the care of patients is estimated.

Conclusions

The impossibility of a physician to address part of his social responsibility by not getting involved on academic and research activities could be considered overwhelming. However, there is no reason for such an interpretation when it is understood that the responsibility of this professional is the generation of medical knowledge and its use for the improvement of patient care. It is the responsibility of administrative personnel and healthcare systems designers to promote favorable environments to engage physicians in clinical research and publish their results. With this in mind, there are four aspects that are worth thinking of:

- Not all medical practice should become research material, but all research must turn into decision-making material in clinical practice.
- Training in information search techniques and adequate analysis of literature are simple and inexpensive alternatives that will help doctors to refine their questioning and decision-making skills in favor of better patient care. Evidently, this requires basic training that allows assessment of quality information and preventing its acceptance without critical reflection.
- Support to the publication and dissemination in local medical journals can be a mechanism for

stimulating the medical practice-clinical research-publication symbiosis.

- The creation of a favorable environment for physicians to conduct clinical research is an opportunity for healthcare systems administrators and decision-makers to facilitate the generation of medical knowledge that impacts on the quality of care.

Consequently, stimulating academic and research activities in discussion sessions between physicians and residents is suggested, since literature search tools and critical analysis are thereof transmitted, in order to solve questions arising from medical practice. Since many healthcare centers are also teaching centers, this task would only imply time organization, setting up a classroom or a meeting room with computing equipment, access to Internet and interactive communication systems, which allow for real-time medical literature searches and promote communication between physicians from different healthcare centers.

Finally, the promotion and support to local journals can be achieved if physicians ask for those publishing spaces to be opened, and, at the administrative level, if their production and distribution is facilitated.

Knowledge that is generated but not shared is useless knowledge because there is no possibility of applying, reproducing and improving it. Publication is the most powerful mechanism to share knowledge since, on one hand, it forces its generators to structure and order it in an accessible way and, on the other hand, because publishing crystallizes knowledge for its recall and consultation. The publication of medical knowledge, supported by medical practice and clinical research, is useful knowledge that will allow improvement of medical care quality and the fulfillment of the social responsibility inherent to medicine.

References

1. Marder E, Kettenmann H, Grillner S. Impacting our young. Proc Natl Acad Sci USA. 2010;107(50):21233. doi: 10.1073/pnas.1016516107
2. McIntyre E, Eckermann SL, Keane M, et al. Publishing in peer review journals. Criteria for success. Aust Fam Physician. 2007;36(7):561-2.
3. Jowett SM, Macleod J, Wilson S, et al. Research in primary care: extent of involvement and perceived determinants among practitioners from one English region. Br J Gen Pract. 2000;50:387-9. Free text http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1313704/pdf/10897537.pdf
4. Starfield BL, Macinko J. Contribution of primary care to health systems and health. Milbank Quarterly. 2005;83:457-502. doi: 10.1111/j.1468-0009.2005.00409.x.
5. Sullivan F, Butler C, Cupples M, et al. Primary care research networks in the United Kingdom. BMJ. 2007;334:1093-4. doi: 10.1136/bmj.39190.648785.80.
6. Soler-González J, Ruiz C, Serna C, et al. The profile of general practitioners (GPs) who publish in selected family practice journals. BMC Res Notes. 2011 May 26;4:164. doi: 10.1186/1756-0500-4-164. Free text http://www.biomedcentral.com/1756-0500/4/164