

# Insufficient Orthopedic Research Productivity of the Arab Countries: Who Is to Blame?

The quality and productivity of scientific research is a crucial indicator of a nation's prestige, standing, and level of development. The global scientific community is experiencing an exponential growth in the rate of scholarly research output. Some nations and regions have created large information technology bodies for the purpose of exploiting this considerable armory of scientific material and making the full use out of it. Scientific research can also inform public health policies and drive economic progress. The bibliometric analysis provides quantitative and qualitative indices of published scientific material in a specific domain with the aim of assessing its impact within the scholarly community.<sup>[1]</sup>

## WHAT ARE THE ROOT CAUSES OF INSUFFICIENT RESEARCH?

Generally speaking, the medical research productivity of the Arab countries is insufficient and trailing behind the rest of the world. The orthopedic research output is no exception to that rule.<sup>[1,2]</sup> Identifying the root causes of this scientific setback is not easy, but the first step in that long tiring journey is to recognize the existence of this insufficiency. Analysis of the underlying causes behind the limited orthopedic research productivity necessitates a comprehensive approach to both the direct-technical- and indirect-nontechnical-contributing factors.

## TECHNICAL CONTRIBUTING FACTORS

The defective orthopedic research output arising from the Arab countries can in part be secondary to direct or research-related factors such as poor research infrastructure in the form of inadequate hospital documentation systems, limited technologic material resources, and insufficient or scanty research grants, incompetent or missing curricular research education, and lack of appropriate financial and moral incentives, especially for young researchers among other factors.<sup>[1,3]</sup> In contrast to most Arab countries, the Arab Gulf oil-rent economies enjoy a relatively more efficient research environment in terms of both research networking and funding capacities. The health information technology and especially the hospital information systems are capable of improving the quality of health services delivered to patients, increase efficiency with respect to time and expenses, and above all promote scientific research, which can inform the public health policies. This has enabled some of these countries, such as Saudi Arabia, to establish national disease registries and engage in major scientific projects.<sup>[4]</sup> Disease registries are considered a rich mine for generating further research, especially

epidemiologic research. In general, the establishment of national disease registries and competent health informatics systems is a complex process that entails strong governmental agency commitment in terms of all forms of logistic support required and a collaborative approach with strong leadership at an institutional level. Similar promising initiatives have been driven by the nonoil-rent Arab Gulf economies such as Egypt that aimed to establish and promote the use of health information technology across hospitals. Nevertheless, the outcomes of such initiatives still have to materialize on a larger scale and reach standard international levels enjoyed by some oil-rent Arab Gulf countries such as Saudi Arabia.<sup>[4,5]</sup> I believe that the lack of hospital information systems and intact electronic medical records is a prime barrier to both research intensity and quality in parts of the Arab world. This is because such settings make it impossibly difficult for most Arab orthopedic researchers to conduct credible retrospective research, a significant and major research design in the global medical literature including the orthopedic surgery.<sup>[6]</sup> This is a clear example of wasteful utilization of precious research resources, namely the patients' clinical medical records and databases.

An ambitious incentive-oriented approach that targets mainly undergraduate "potential" researchers and postgraduate "junior" researchers and finally university staff "senior" researchers was also adopted by Saudi Arabia. There is evidence that all of the above strategies are paying off for Saudi Arabia in orthopedic surgery, among other medical and nonmedical disciplines.<sup>[7]</sup> Nevertheless, the overall domestic research expenditure of the Arab Gulf countries as a share of the gross domestic product remains low.<sup>[1]</sup>

## NONTECHNICAL CONTRIBUTING FACTORS

Administrative bureaucracy, substandard wages, adverse working conditions, social insecurity, and political/sectarian unrest with all its economic ramifications are all important contributing and deterring factors. Unfortunately, the government spending priorities in many regions of the Arab world do not prioritize research and education fully. All of the above factors appear inseparable and even greatly interdependent. Unfortunately, these deterring factors constitute a perfect setting for an exodus of the skilled human capital, namely researchers, a phenomenon also known as brain drain.<sup>[8]</sup> Interestingly, brain drain is demonstrated through the exodus of skilled researchers/academics from low-income Arab countries to high-income Arab Gulf countries and to Western high-income countries alike. In that regard, it is important to

point out that there are notable differences between the research output of Arab authors affiliated to international institutions and that of Arab authors affiliated to home/Arab institutions.<sup>[1,9]</sup> For example, while many prospective and innovative doctorate and master's thesis are being conducted across Egyptian medical schools, few make their way to high-ranking peer-reviewed journals. On the other hand, the slogan of "publish or perish" is actually benefiting research intensity at the expense of research quality and more importantly, research ethics.<sup>[10]</sup> This applies to both medical research in general and orthopedic research in particular. Any management plan has to take into account and even begin with addressing the above nontechnical factors. It has been noticed that the research productivity of academics falls after attaining professor rank due to direct research-related causes.<sup>[11]</sup> I believe that this decline in research productivity can be collectively attributed to both direct research-related and indirect nontechnical factors stated above. Not surprisingly, the deficiencies of the clinical orthopedic research output mimic those of basic science orthopedic research. This will definitely affect the development of translational orthopedics, a critical and emerging research discipline.

### Recommendations

Implementing a comprehensive reform strategy can be a daunting task. The following can serve as general and practical reform guidelines:

- The research domain should be incorporated into the national strategic agenda of the Arab countries if they are to make a comeback among the world's scientific and technologic key players
- A good start point is the universities, and a good tackle is to design a researcher-centered approach
- Urgent and wide-scale adoption of health information technology in hospital settings is an indispensable tool to the success of any research-promoting strategy
- Tighter administrative control of academic institutions needs to be well balanced with drastic and, at the same time, practical measures to improve the research environment and eliminate barriers to research productivity. Drainage of human capital cannot be compensated for on any front.

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