Iranian J Publ Health, Vol. 42, Supple.1, 2013, pp: 55-59

National Report

Trend of Knowledge Production of Research Centers in the Field of Medical Sciences in Iran

K Falahat [1], MB Eftekhari [1, 2], E Habibi [1], Sh Djalalinia [1, 3], N Peykari [1, 3], P Owlia [1, 4], H Malekafzali [5], M Ghanei [1], *Sh Mojarrab [1]

1. *Deputy of Research & Technology, Ministry of Health & Medical Education, Tehran, Iran*
2. *Social Determinants of Health Research Center, University of Welfare and Rehabilitation, Tehran, Iran*
3. *Endocrine and Metabolism Research Center, Tehran University of Medical Sciences, Tehran, Iran*
4. *Dept. of Microbiology, Faculty of Medicine, Shahed University, Tehran, Iran*
5. *Dept of Health, Tehran University of Medical Sciences, Tehran, Iran*

***Corresponding Author:** Tel: +98-21-64892603 Email: mojarab.shanaz@yahoo.com

(Received 10 Apr 2012; accepted 16 Oct 2012)

Abstract

Establishment of medical research centers at universities and health-related organizations and annually evaluation of their research activities was one of the strategic policies which followed by governmental organization in last decade in order to strengthening the connections between health research system and health system. The aim of this study is to scrutinize the role of medical research centers in medical science production in Iran. This study is a cross sectional which has been performed based on existing reports on national scientometrics and evaluation results of research performance of medical research centers between years 2001 to 2010. During last decade number of medical research centers increased from 53 in 2001 to 359 in 2010. Simultaneous scientific output of medical research centers has been increased especially articles indexed in ISI (web of science). Proper policy implementation in the field of health research system during last decades led to improving capacity building and growth knowledge production of medical science in recent years in Iran. The process embedding research into the health systems requires planning up until research products improves health outcomes and health equity in country.

Keywords: Medical Research Center, Knowledge Production, Health System

Introduction

The main goal of health system is to improve public health. Health and medical researches in worldwide, particularly in developing countries face many problems including globalization, inequity in health, appearance of recurrent and new diseases, increasing poverty, economic crises, national and regional conflicts, threat of chemical and biological weapons, increasing psychiatric diseases and health related expenditures (1). Comprehensive planning in the field of health is responded two basic needs in a country, health community and scientific movement for development. "The health research system in a country exists at the intersection of two, larger, complex systems – the health system and research system" (2). Research on health needs researches in other field of sciences. Establishment of medical research centers (MRCs) at universities and health-related organizations and annually evaluation of their research activities was one of the strategic policies which followed by governmental organization in last decade in order to strengthening the connections between health research system (HRS) and health system (3).

MRC, an organized research unit, defines as dependent multidisciplinary entity at a university of medical sciences or a health research system

organization with many different purposes such as promoting qualitative and quantitative health research, improving the human and physical resources for health research, researching in priority areas and benefit from results of research in practice (4). Different types of research centers have existed at universities for many years, at least since the late 19th century (5). The history of establishment of research center has begun after approval of the Supreme Council of Cultural Revolution in 1990 In Iran.

The aim of this study was to scrutinize the role of medical research centers (MRC) in medical science production in Iran.

Methods

This study is a cross sectional performed based on existing reports on national scientometrics and evaluation results of research performance of MRCs from 2001 to 2010. From 2001, Deputy of Research and Technology, Ministry of Health and Medical Education (MOHME), as the main national policy maker in NHRS is responsible to evaluate MRCs` research performance annually and all MOHME approved MRCs have been involved. MRCs have been evaluated by comprehensive research indicators derived from HRS functions defined by WHO and modified by MOHME (2, 6-7). These indicators are revised and developed annually based on NHRS policies considering stakeholders` opinions.

One of the most important axes of research activities of MRCs is knowledge production which is evaluated by below criteria.

- Number of published articles indexed in ISI/web of sciences, Pub med/Medline and other scientific international database[1]
- Number of non-indexed published articles
- Number of citations to articles and articles referred in textbooks
- Number of articles presented in national and international congresses
- Number of defended post graduated thesis

After gathering data based on the results and experience of one decade evaluation of MRCs knowledge production performance, we explored the probable role of MRCs in knowledge production in Iran.

Results

During last decade the number of MRCs increased from 53 in 2001 to 359 in 2010. Simultaneous scientific output of MRCs has been increased especially articles indexed in ISI (web of science) (Fig.1).

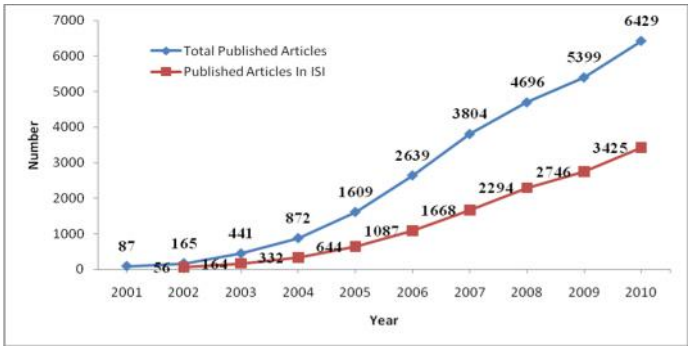

Fig.1: Number of indexed articles published by MRCs between 2001-2010

The ratio of articles published by research centers per number of MRCs indicated that although it has increased from 2001 to 2007, it had a decreasing trend in recent years (Fig. 2). The proportions of total articles and articles indexed in ISI/Web of Science published by MRCs to total articles and articles indexed ISI/Web of Science published by medical science universities of the country was 67% and 86% in 2010, respectively (Fig. 3). The proportion of published papers by MRCs in the field of medical sciences in Middle East has been increased as 0.06% in 2006 to 0.11% in 2010. In addition comparing these numbers to the world is from 0.002% in 2006 to 0.005% in 2010. Comparing the different scientific groups in the terms of numbers of the articles in ISI (web of science) in

[1] Other scientific international database such as Scopus, Embase, CAB, Cinhal, Biological Abstract, Index Medicus for eastern Mediterranean Regional Office, Index Copernicus and ….

Iran between 1999- 2009 includes: medical science 6520, Biology and Biochemistry 1461, Pharmacology and Toxicology 1274, Neuroscience and Behavior 681, Molecular and Genetic Sciences 408, Microbiology 270, Immunology 323, and Psychology and Psychotherapy 270.

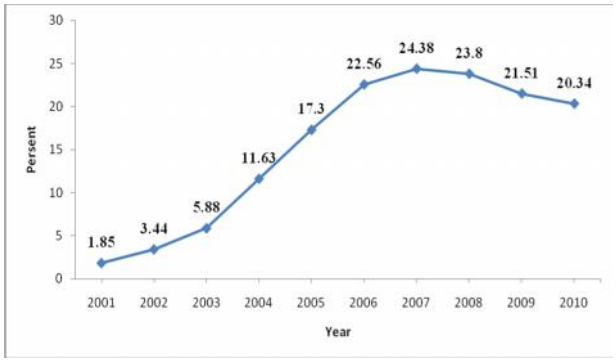

Fig.2: The proportion of articles published by MRCs per number of approved MRCs

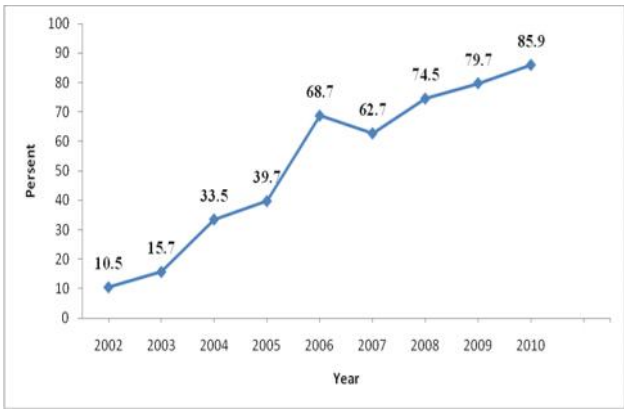

Fig.3: The Propertion of MRCs'articles to medical sciences univercities' articles

According to the latest list issued by the Thomson Reuters Based on database ISI: web of science period of 11 years (Beginning January 2000 to March 2011) 335 papers published by researchers of Iran were in the list of one hundreds full reference papers whereas 26 articles from 335 papers were written in collaboration with the MRCs.
Based on last information from the MOHME Commission for Accreditation and Improvement of Iranian Medical Journals, 237 journals are published which 13 percent of them belong to MRCs. Also, 25 percent of approved medical journal indexed in ISI (web of science) are published by MRCs.
Existing data showed the considerable rise of MRCs in both clinical and biomedical types**.** Clinical MRCs had most investigation in the field of internal medicine whereas biomedical MRCs had most investigation in the field of pharmaceutical sciences and cellular medicine. The ratio of number of citation papers of MRCs to number of MRCs has been increased from 11.6 in 2005 to 56.5 in 2010. According to the Scopus database in 2010, the number of citation of Iranian papers was 10,112 whereas the number of citation of MRCs` papers was 7082.
Findings revealed that MRCs` researchers presented 355 articles in national and 292 articles in international congresses in 2001 comparing to 4555 and 3279 in 2010. The proportion of articles presented in international congresses per researcher was 0.46 which has reached to 0.85.
Findings of other indicators showed the number of defended post graduated theses performed in MRCs was 232 in 2001 which has more than 12 times increase in 2010.
Considering the number of researchers in R&D (per million people) Iran's rank is 34 while Turkey's rank is 31 in the world. As well as the ratio of number of published article by MRCs to number of academic and non academic member of MRCs increased from 0.2 in 2001 to 1.67 in 2010.

Discussion

Proper policy implementation in the field of health research system during last decades led to improving capacity building and growth knowledge production of medical sciences in recent years in Iran. According to various reports, worldwide, Iran has the most growth in the field of science due to high increase in the numbers of publications during the past decade (8-10)
In 2009, 1.04% of all world medical articles have been published by Iran. Between 2005- 2009, 0.1% (15 articles) of Iranian medical sciences articles had high impact factors (11). WHO, the Council on Health Research for Development

(COHRED), the Global Forum on Health Research and other agencies concerned with international health have consistently emphasized that a primary function of sustainable knowledge systems is needed to create and continuously improve the human and physical resources for health research (12).

Increasing the number of MRCs as research based unit had noticeable effects in improving health research system wide spread in Iran such as empowering capacity building, employment of expert people in the field of public health, facilitating the relationships between researchers, institutionalizing of research culture, appropriate documentation, expanding the culture of team working and organizing research projects.

Ascending trend of increasing MRCs which must be navigated toward solving community needs, has been defined as a great strategy by National scientific Map to achieve first scientific position in science and technology in the Middle East and also, one of the most critical objectives of the Fifth Development National Plan in health domain in order to achieve healthy lifestyle and health community with a minimal health threat in 2025 (13). However, this strategy have encountered many problems that depend on many features such as economic situation, social environment, natural disaster and other physical, psychological and social factors related to human. These factors constantly caues change health system encountered to new challenge that must be able to use knowledge to solve them.

Besides to achieve the national objectives, local and regional researches have the first priority to solve public health problems which unfortunately seem to be ignored due to the efforts of research designers in MRCs who prefer the process of research documentation. Also, it is unclear the role of MRCs in the process of linkage between the knowledge production and utilization of knowledge to improving the health status. Dispersion of MRCs due to the increase in the number of MRCs in many various field should be resolved by their cooperation. If this dispersion does not organize, it will lead to waste the financial and human recourses.

As "transition from research to policy to actions and eventually to health improvements are not linear processes"(2), it is necessary to expand the scope of research to other scientific filed which are indirectly related to public health and macro-planning program for improvement professional and public values.

We propose that research activity of MRCs in frame of research network should be organized. Also a systematic perspective will enable MRCs to improve their research activities in the field of national health priorities. One of the most critical methods in this regard is to consider MRCs research activities based on local and regional priorities.

Ethical considerations

Ethical issues (Including plagiarism, Informed Consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc) have been completely observed by the authors.

Acknowledgment

This project has been led by Deputy of Research & Technology, Ministry of Health and Medical Education of I.R of IRAN. The authors thank from cooperation of all of the medical sciences university's participants who have made this experience. The authors declare that there is no conflict of interest.

References

1. Lansang MA, Dennis R (2004). Building capacity in health research in the developing world. *Bulletin of the World Health Organization,* 82:764-770.
2. Pang T, Sadana R, Hanney S, Bhutta ZA, Hyder AA,Simon J (2003). Knowledge for better health: a conceptual framework and foundation for health research systems. *Bulletin of the World Health Organization,* 81:815-820.
3. White F (2002). Capacity-building for health research in developing countries: a manag-

er's approach. *Revista Panamericana de Salud Pública,* 12:166-172.
4. Gray DO (2008). Making team science better: Applying improvement-oriented evaluation principles to evaluation of cooperative research centers. *New Directions for Evaluation,* 2008:73-87.
5. Miller J (2011). Universities, Industry, and Government in Collaboration: A Review of the Literature on Research Centers. SSRN elibrary, 2009
6. Peykari N, Djalalinia SH, Owlia P, Habibi E, Falahat K, Ghanei M, Malekafzali H, Bradaran Eftekhari M (2012). Health Research System Evaluation in I.R of Iran. *Arch Iran Med,* 15(7):394-399.
7. Vatankhah S, Tabibi J, Tourani S, Bahrami MA (2009). Development of iranian health R and D performance assessment indicatores. research journal of biological sciences. *Research Journal of Biological Sciences*, 4(11): 1202-1207.
8. Massarrat S, Kolahdoozan S (2011). Critical assessment of progress of medical sciences in Iran and Turkey: The way developing countries with limited re-sources should make effective contributions to the production of science. *Arch Iran Med,* 14:370-7.
9. Mohammadhassanzadeh H, Samadikuchaksaraei A, Shokraneh F, Valinejad A, Abolghasem-Gorji H, Chen Y(2010). A bibliometric overview of 30 years of medical sciences productivity in Iran. *Arch Iran Med,* 13:313-317.
10. Moin M, Mahmoudi M, Rezaei N (2005). Scientific output of Iran at the threshold of the 21st century. *Scientometrics,* 62:239-248.
11. Scientometric Unit Report, Available from: http://www.hbi.ir/NSite/SpecialFullStory/News/?Id=636&Level=11 (Accessed Date: 14 Feb 2012)
12. Burdick W, Morahan P, Norcini J (2007). Capacity building in medical education and health outcomes in developing countries: The missing link. *Education for Health,* 20:1-9.
13. The fifth Development Plan of Iran. Available from: http://ictb.ir/index.php/1389-12-02-12-27-38 (Accessed Date: 23 Dec 2012)