Mapping the Contribution and Participation of Saudi Institutes in Research Associated with Radiological Sciences From 2014 to 2018

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ABSTRACT

The purpose of this observational study is, to estimate the participation of Saudi institutes in research related to radiological sciences. PubMed/Medline database is the main source to retrieve, collect and tabulate the research written or participated by authors as solo or corroborators in publications published in journals from the period 2014 – 2018 in Microsoft Excel 2010. There were 2738; 5.6 authors wrote 485 manuscripts as 97 per annum and 8.08 per month. The 304; 62.6% authors were identified as a first author following by 96; 31.5% and 37; 7.6% authors as a second and third author in 485 manuscripts affiliated with institutes operational in Saudi Arabia. There are 87; 17.9% institutes, which contributed and published their research in 232 journals allied with PubMed Indexed database. The 15 major disciplines as core subjects related to medical and radiological sciences have been figure out in this research. This is, firmly believed that one research article was published in every fourth day the past five years reflecting the participation of radiological sciences in healthcare. Technology helps in making collaborative manners to share ideas, experimental findings, designing of the research, drawing results and taking decisions and opinions.

KEY WORDS: BIBLIOMETRIC, RADIOLOGICAL SCIENCES, SAUDI ARABIA

INTRODUCTION

Radiological science used to identify the diseases and injuries of the human body in healthcare as supportive in diagnostic and treatment. Ultrasound, Magnetic Resonance Imaging (MRI), Sonography, Positron Emission Tomography (PET), nuclear medicine, Mammography and Computed Tomography Scanning (CT-Scan) are

famous technological methods to observe human tissues. Bibliometric study is a common practice for scientific institutes, libraries in healthcare societies, and pharmaceutical research to gauge the information of specific subject or sub-specialty of subject published in a particular journal or database. A bibliometric analysis provides a wide array of information on numerical data of published literature in a specific discipline or sub-specific branches of any discipline. Peer-reviewed literature in radiology required mechanism for investigators to communicate their results are focused, varying standards, evidence-based, encompassing influence on clinical or administrative management in advance human healthcare.

Open access (OA) journals allied with a PubMed Indexed database, which allows free access of academic articles to read, search, download, share, use them for indexing,

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and print the full texts. Published articles are immediately available on the websites of journals and charges of publications paid by the author where only subscribers have immediate access. However, to make the article available on their personal, institutional web pages. Subsequently in April 2003 a bibliometric study was conducted to compare, the radiological research in Europe published in biomedical peer-reviewed journals indexed in web of science (WeS) with the United State of America, which were found slightly decreased.

Additionally, another study analyzed the authorship pattern in radiology publications and retrieved 142,576 articles written by 699, 257 authors participating from all over the world in National Library of Medicine MEDLINE database from 1991 to 2012 as 4.9 average authors per article. Besides this, partially similar research conducted to evaluate the contributors in the functional magnetic resonance (fMRI) literature on chemosensory. This research finds that 1660 articles, those were produced by 5200 authors, which were published in 423 journals; orbitofrontal cortex, insula, and amygdala gather good numbers of citations. In all likelihood, The Kingdom of Saudi Arabia is focused on national health care information system with the number of healthcare professionals at all levels; primary, secondary and tertiary with facilities and proficiencies of educated and trained pre-hospital caregivers, quality equipment, along with the participation of society.

These initiatives highly recognized by World Health Organization (WHO). Recently, the data of global research on the topic of rehabilitation of spinal cord injury published from 1997 to 2016 in China, downloaded from the Web of Science (WOS) and evaluated to gauge the association of country, institute, and journal. United States of America (USA), The University of Washington and The Archives of Physical Medicine and Rehabilitation found most active participators. Relatively study was conducted to discover the quantity and quality of data on the contribution of African authors in neurosurgical journals worldwide and using the PubMed database from 1999 to 2018. Thirty-one African countries contributed 974 articles in reported research.

Simultaneously, data retrieved from the Science Citation Index Expanded (SCI-E) from 1999 – 2017 on a similar study with the same objectives was conducted on research trends on global obesity. United States of America, Japan, Italy, the United Kingdom, and Turkey come-forth on five slots among the 153 countries, which were produced 50,246 articles. [10] A prospective Strategic Research Agenda on the idea of responsible research and innovation in radiological protection proposed in International Symposia on Ethics of Environmental Health with six research lines of interest and concern, i.e. 1) Effects of social, psychological and economic aspects on radiological protection behavior, 2) Holistic approaches to the governance of radiological risks, 3) Responsible research and innovation in radiological protection, 4) Stakeholder engagement and participatory processes in radiological protection research, development, policy and practice, 5) Risk communication, and 6) radiological protection cultures. PubMed resources indexed in MEDLINE, which contain approximately 30 million citations, full-text journal articles and abstracts in supporting to the literature of biomedical and life sciences under the purpose of cure and prevent diseases globally since 1996.

MATERIAL AND METHODS

The data of research on radiological sciences published from January 1st, 2014 to 31st December 2018, in the PubMed indexed journals affiliated with institutes, functioning in Kingdom of Saudi Arabia was downloaded and tabulate in MS Office Excel Sheet 2010. The comma-separated value (CSV) file, and Abstract on Note-paid used to download. Boolean operator typed “Ultrasound, Magnetic Resonance Imaging (MRI), Sonography, Positron Emission Tomography (PET), nuclear medicine, Mammography and Computed Tomography Scanning (CT-Scan)”, AND appears by default, typed “Kingdom of Saudi Arabia” select as “Affiliation” in the second menu. The fourfold objective was set to identify; a) to assess the year wise growth, b) to estimate the authorship pattern, c) to evaluate the author position in the publications and d) to calculate the top ten subject specialties encompassing to radiological sciences published in journals.

Table 1. Study design.

S. No	Year	Articles Download	Excluded	Articles Included for analyzed	Articles per year average	Authors per Article
1	2014	107	12	95	7.9	465 (4.8)
2	2015	123	20	103	8.58	526 (5.1)
3	2016	115	13	102	8.5	547 (5.3)
4	2017	118	16	102	8.5	656 (6.4)
5	2018	111	28	83	6.91	544 (6.5)
Total	574	89	485	8.08	2738 (5.6)	574

RESULTS

This study retrieved 574 case reports, original and review articles. The inclusion criteria were only specialties and

sub-specialties of medicine and allied medicine, surgery, and allied surgery to take support from the discipline of radiological sciences. Table 1 show that 2738; 5.6 authors wrote 485 manuscripts as 97 per annum and 8.08 per month average during the period 2004 – 2018.

Table 2. Author's position in manuscript affiliated with institute functioning in Saudi Arabia from 2014–2018

S. No	Authors position in article	Year 2018	Year 2017	Year 2016	Year 2015	Year 2014	Total	%
1	Solo or Single Author	46	55	64	70	69	304	62.6%
2	Two Authors	20	22	23	17	14	96	19.7%
3	Three Authors	9	10	6	8	4	37	7.6%
4	Four Authors	3	6	4	1	3	17	3.5%
5	Five Authors	3	3	3	2		11	2.2%
6	Six Authors	1	1	2	5	3	12	2.4%
7	Seven Authors		1			1	2	0.4%
8	Eight Authors		1			1	2	0.4%
9	Nine Authors	1					1	0.2%
10	10 - 19 Authors		2				2	0.4%
11	20 - 29 Authors		1				1	0.2%
12	Total Articles	83	102	102	103	95	485	
13	Institutes Involve in Research	272	365	374	447	362	1820	3.7
14	Authors Participation per article	465	526	547	656	544	2738	5.6

Table 3. The participation of the institutes in research productivity of radiological sciences existing in the Kingdom of Saudi Arabia during the period 2014 - 2018

S No	Institutes	Articles	2014	2015	2016	2017	2018	Total	with%
1	King Saud University, Riyadh	94	13	15	24	24	18	94	19.3%
2	King Abdulaziz University Hospital & University, Jeddah	59	13	25	8	8	5	59	12.1%
3	King Faisal Specialist Hospital & Research Center, Riyadh	39	3	15	8	7	6	39	8%
4	Imam Abdulrahman Bin Faisal University, Dammam	32	3	5	10	11	3	32	6.6%
5	King Fahad Medical City, Riyadh	27	11	4	4	4	4	27	5.5%
6	King Fahad Specialist Hospital at Dammam	21	4	3	5	3	6	21	4.3%
7	King Abdulaziz Medical City, Riyadh	20	5		7	5	3	20	4.1%
8	Al-Qassim University	14	1	6	1	4	2	14	2.8%
9	King Saud bin Abdulaziz University for Health Sciences, Jeddah & Riyadh	13	3	2	1	5	2	13	2.6%
10	King Abdullah Medical City, Makkah	11	4	1	4	1	1	11	2.2%
11	02 Institutes Published Ten Articles							20	4.1%
12	02 Institutes Published Nine Articles							18	3.7%
13	02 Institutes Published Seven Articles							14	2.8%
14	03 Institutes Published Five Articles							15	3%
15	01 Institute Published Four Articles							4	0.8%
16	04 Institutes Published Three Articles							12	2.4%
17	09 Institutes Published Two Articles							18	3.7%
18	54 Institutes Published One Articles							54	11.1%
	Total Articles	485							

Table 2 reveals that the 304; 62.6% authors identified as a first author following by 96; 31.5% and 37; 7.6% authors as a second and third author in 485 manuscripts. Authors had 4th to 9th position in 45; 9.2% articles, only 3; 0.61 authors relate the position from 10th to 29th in articles.

Table 3 stated that 87; 17.9% institutes related to the public and private sectors have been participated in the 485 publications. Total n=330; 68% of articles were produced by 10 institutes. The 155; 32% articles were harvest by 77 institutes from 2014 to 2018 in various journals.

Table 4. Subject-wise distribution of publications (Largest to smallest, n=485)

Subject	2014	2015	2016	2017	2018	Total Articles	%
1 Radiology, CT Scan, Nuclear Medicine, Medical Imaging, Ultrasound and Magnetic Resonance Imaging (MRI)	20	31	14	23	27	115	23.7%
2 Dentistry	11	20	21	28	14	94	19.3%
3 Cardiology	9	14	12	12	5	52	10.7%
4 Oncology	7	11	14	8	9	49	10.1%
5 Surgery	21		10	6	12	49	10.1%
6 Otorhinolaryngology	6	3	7	6	3	25	5.1%
7 Neurology & Neurosurgery	2	3	4	2	6	17	3.5%
8 Ophthalmology	4	1	6	4	1	16	3.3%
9 Pediatric	5	2	4	2	2	15	3%
10 Urology	2	8	1	3		14	2.8%
11 Pulmonology or Respiratory Care	6	2		3	3	14	2.8%
12 Orthopedic	1	3	5	2	1	12	2.4%
13 Emergency Medical Sciences/Services		5	2	2	1	10	2%
14 Gastroenterology	1			1		2	0.4%
15 Anesthesia			1			1	0.2%
	95	103	101	102	84	485	

Table 5. Journal-wise distribution of publications (Largest to smallest, n=485)

S. no	Name of the journal	Publications	%
1	BMJ Case Reports.	27	5.5%
2	Saudi Medical Journal.	19	3.9%
3	Asian Cardiovascular Thoracic Annals.	14	2.8%
4	Journal of College Physicians and Surgeons Pakistan.	14	2.8%
5	Radiation Protection Dosimetry.	11	2.2%
6	Oral Surgery Oral Medicine Oral Pathology and Oral Radiology.	9	1.8%
7	Neurosciences (Riyadh).	8	1.6%
8	Ann Saudi Med.	7	1.4%
9	06 Journals published 4 article in each	24	4.9%
10	5 Journals published 5 article in each	25	5.1%
11	13 Journals published 4 article in each	52	10.7%
12	17 Journals published 3 article in each	51	10.5%
13	39 Journals published 2 article in each	78	16%
14	146 Journals published 1 article in each	146	30.1%
	Total articles	485	

Table 4, present 15 major specialties and sub-specialties of medicine, surgery and radiological sciences by the researcher's affiliation as core subjects in the melody

of the manuscript of research. Radiological sciences with its sub-specialties published 115; 23.7% out of 485 articles as maximum to explain the integrated value

of this discipline. Dentistry 94; 19.3%, Cardiology 52; 10.7% followed.

Total 232 journals were published n=485 articles from 2014 – 2018. Only n=85; 17.5% articles published in five journals and remaining 400 articles published in 227 journals out of 232 journals.

DISCUSSION & CONCLUSION

Presently, a study finds 61 institutes paid contribution and participation and produced 241 articles in publishing research interrelated with emergency medical services. Majority articles n=206; 85.4% were written by multi-authors collaboratively out of 241 articles. The spectrum of 485 articles constructing their magnum opus. It shows that 87; 17.9% institutes linked to the public and private sectors of Saudi Arabia, collaborate in writings and 2738; 5.6 authors wrote manuscripts in-connection with 15 major specialties and sub-specialties of medicine, surgery and radiological sciences. King Saud University,

Riyadh take lead and presents n=94; 19.3% articles as single institute and followed by King Abdulaziz University Hospital & University, Jeddah. In conclusion, it revealed that the provision of an article on every fourth day of the month shows the keen interest of researchers working in Saudi institutes specifically in radiological sciences and satisfaction with the policies, organizational vision and culture, and encouragements.

Disclaimer: This study reflects the data published in Med Indexed Journals not inclined or declined growth of any organization, city, country and standards.

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