

Reflection of Gastrointestinal Cancers on Iranian Scientific Publications Indexed In International Databases (Medline & Scopus)

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ABSTRACT

Introduction: Gastrointestinal (GI) cancer is one of the most common and fatal type of cancers and it is responsible for about half of mortalities from cancer (44.4%) in Iran. Regarding the considerable prevalence of GI cancers in Iran and the world and its impact on patients and society the necessity toward scientific investigations seems to be highlighted.

Methods: A cross- sectional descriptive survey was conducted using Scientometrics criteria. Data were collected from two Medline and Scopus databases as search ground. To extract data from the advanced search link in Scopus database, the researcher made searching strategy designed to include all of “GI cancer-related” keywords was used. Keywords included 17 terms combined with 9 keywords about malignancy, tumor and cancer. Ultimately, we formed 153 different keywords. The search strategy in Medline database was designed based on Medical Subject headings (MeSH) via a subject specialist (medical specialist) help. Then, data was transferred to the check list in Microsoft Excel software and analyzed afterward.

Findings: analyzed data showed that 1826 documents in terms of GI cancer written by Iranian researchers were indexed in Scopus and 468 in Medline databases. Regarding the subject matter, Iran’s ranking was 30 in the Scopus, 31 in Medline, 10 within Asian countries, and 3 in Middle-east. Tehran University of Medical Sciences with production of 35.17 percent of documents in Scopus database and 27.35 percent of documents in the Medline database was identified as most active centers in this field .In both of these databases, “Asian Pacific Journal of Cancer Prevention” includes most Iranian documents in this field.

Conclusions: The study suggested a linear increase of scientific production about GI cancers in both databases during study time.

Keywords: Scientific production, Scopus database, Medline database, Scientometrics, gastrointestinal cancer, Iran

Introduction

Cancer accounts as a major cause of mortality and morbidity in human societies (1). It is the third leading cause of death in Iran, and affects more than 100,000 people annually in the country (2).On the other hand, an increase in average life expectancy, aging of society, development of environmental pollutants and going away from a healthier lifestyle in recent years are associated with the increased disease prevalence and decrease of affection age in this country (3).Very expensive and difficult or even impossible treatment of most types of cancers allocated a significant proportion of the health budget in countries (4). Growing industrial societies and crowding in metropolises have caused a lot of pollution, which leads to Consequences including cancer (5).The incidence of GI cancers is rising in Iran. The risk of this cancers is determined in a large extent by environmental factors such as dietary factors and Helicobacter pylori infection (6,7). GI cancers constitute about 25 percent of the common cancers in the country (8). These malignancies are of particular importance among other cancers because of high mortality and incidence (9-12).In general, GI cancers account for cause

of almost half (44.4%) of deaths from cancer in Iran (13). Beside physical problems it creates various social and psychological problems. The disease creates problems not only for the patients but also for their family. The high cost of the disease and economic problems, are problems that the individuals and families endure (2,14). The high prevalence and complications of GI cancers in the country, mandate the conducting scientific researches and surveys to assess the country's proceedings, developments and successes about the disease control, in order to provide solutions for improvement of prevention quality, more effective and cost effective treatments and rehabilitation programs.

In today's competitive world, the countries have a staggering pace of sustainable development. The countries have entered into post-industrial society with the transition from industrial society and now are going through the information society. Obviously, at this point of time, the delay in the production of scientific information is not permitted and must try to increase the quality and quantity of the products (15).

One of the standard tools for measuring and evaluating scientific information in different areas, is Scientometrics indicators. Using the Scientometrics tools, one can check the quality and quantity of scientific production in various scientific ground (16,17).

The study was conducted to assess the scientific production in the field of GI cancer by Iranian researchers which have been indexed in Scopus and Medline databases, since 2002 to 2012. Other aims of the study are assessment the world rank of Iran, regarding the conducted researches in the field of GI cancer, in Scopus and Medline databases, evaluation of Iranian academic centers and institutes producing science evidences in this field, as well as identifying the most active universities and researchers. Also, assessment of the scientific production in this field, facilitate the decision making and planning in this subject area and scientific research and future policies.

Methods

A cross- sectional descriptive survey was conducted using Scientometrics indicators. Data were collected from two Medline and Scopus databases as research population. The bibliographic information of articles published in international journals and indexed in these databases were extracted and statistically analyzed. Medline and Scopus databases were selected because of their reliability, availability and applicability in the biomedical field, and including a wide range of journals (18, 19). Scopus database was launched in late 2004 by the Elsevier Institute (Dutch publisher). Covering 55 million records from more than 21,915 topics of at least 5000 international publishers, including more than 17,000 international scientific journals, Scopus is the world's largest database of indexing and abstracting (7). Medline database is a search and retrieval media for resources in the field of medical science which is provided by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine of America. This database provide the possibility of searching among more than 22 million articles from 5600 medical journal since 1955 (20).

In order to extract data from the Scopus and Medline databases, the researcher at first selected the term of "Gastrointestinal Neoplasm" as the main keyword in basis of Medical Subject headings (MeSH) and by help of a subject specialist (GI cancer specialist). To collect data from the Medline database, at first the raw data from the National Center for Biotechnology Information was recovered through the search engine PubMed (Published Medical Literature) and by limiting the MEDLINE database from label (SB). Using the limitation in Medline database (regarding MeSH term: Gastrointestinal Neoplasm) we retrieved only publications that their main focus is in the field of GI cancer. This resulted in minimizing the false loss when restoring the information, and with limiting the time period to 2002-2012 and selecting the Medline database from the Subset, the data recovery was performed.

The term IRAN were added to search keywords regarding organizational restrictions and all Iranian publications in the field of GI cancer were recovered from Medline database, which 486 were restored and with the elimination of duplicate documents, 468 publications were collected. Then, this phrase was used for other countries. So, other countries was searched instead of Iran, and eventually the search term of "gastrointestinal" was used to all publications in the field of GI cancer and without restrictions to Iran, and ultimately 182,833 publications were retrieved.

In the shade of more extensive word-search in Scopus database, the researcher used the search strategy designed to include all of “GI cancer-related” keywords in the advanced search of the database. The Keywords included 17 terms including “gastroenterology, gastrointestinal, GI, Digestive system, colon, stomach, intestine, gastric, esophagus, ileum, anal canal, cecum, rectum, jejunum, duodenum, liver, Pancreas” which were combined with 9 keywords related to malignancy, tumor and cancer, including “Cancer, tumor, carcinoma, adenocarcinoma, neoplasm, masses, malignancy, sarcoma, lymphoma” and ultimately formed 153 different keywords.

The code TITLE-ABS-KEY was used in the researcher-designed strategy, which means that if the key words were present in the title, abstract or keywords of publications, the related article to be appear in the findings. So, in Medline database, with limitation to country IRAN and time period of 2002 to 2012, all Iranian publications in the field of GI cancers were extracted and 1826 publications were retrieved. Then the designed search strategy was used without limiting to Iran, and the total number of 393,129 publications were retrieved.

In order to collect data and respond to study questions, including authors, institutional affiliations of researchers, and date of publication, the two mentioned databases were retrieved and the software Excel 2013 was used for data analysis.

Findings

The scientific production process in Iran in the subject field of gastrointestinal cancer in Scopus and Medline databases, since 2002 to 2012: According the results of analysis of data obtained from Scopus and Medline databases, the scientific production in the field of gastrointestinal (GI) cancer in Iran is growing, so that it has increased from 11 documents in 2002 up to 413 in 2012 in Scopus database. The growth in the amount of research conducted on the topic of GI cancer is also seen in the Medline database, so that it has increased from only 3 documents in 2002 up to 87 in 2012.

Table 1-The scientific production in the field of GI cancer in Iran in Scopus and Medline databases, since 2002 to 2012

Scopus				Medline			
year	Publications		Average growth rate	year	Publications		Average growth rate
	No.	%			No.	%	
2002	11	0.58	136.36	2002	3	0.64	33.33
2003	26	1.37	65.38	2003	4	0.85	200.00
2004	43	2.27	90.70	2004	12	2.56	166.67
2005	82	4.32	28.05	2005	32	6.84	-9.38
2006	105	5.54	19.05	2006	29	6.20	20.69
2007	125	6.59	42.40	2007	35	7.48	45.71
2008	178	399	38.20	2008	51	10.9	27.45
2009	246	12.97	4.07	2009	65	13.89	-1.54
2010	256	13.50	61.33	2010	64	13.68	34.38
2011	413	21.78	-0.48	2011	86	18.38	1.16
2012	411	21.68		2012	87	18.59	
total	1896	100		total	468	100	

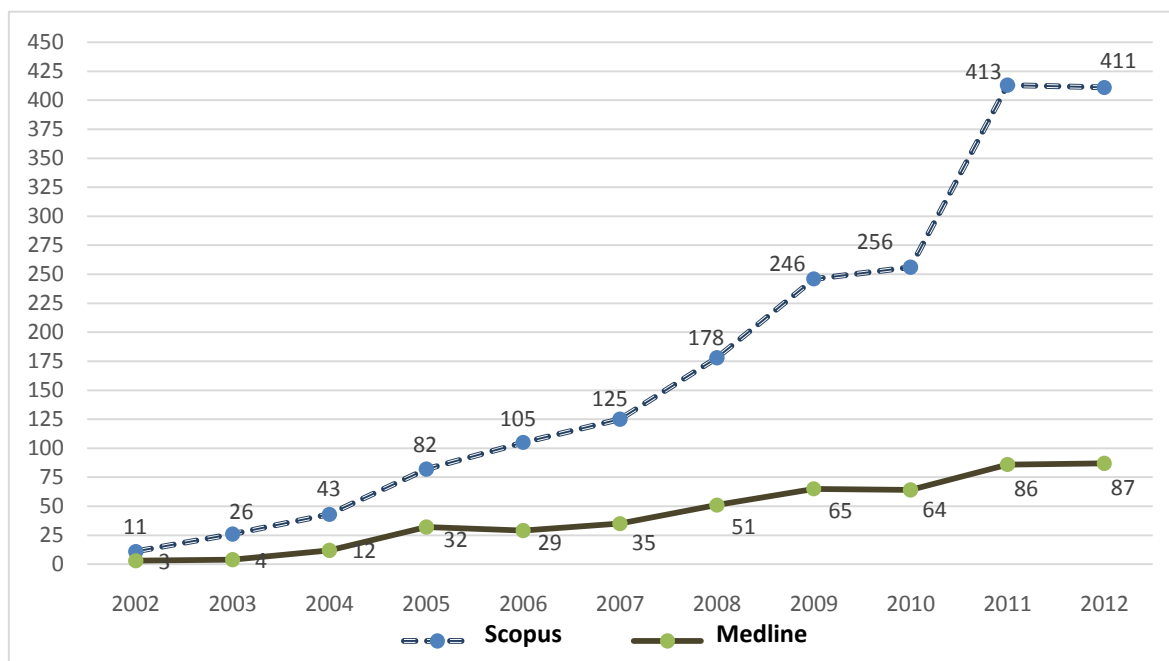


Diagram 1- The scientific production process in the field of GI cancer in Scopus and Medline databases, since 2002 to 2012

The world rank of Iran, regarding the conducted researches in the subject field of gastrointestinal cancer, in Scopus and Medline databases: Restoring of scientific production of in the field of GI cancer from Scopus and Medline databases since 2002 to 2012 indicate that Iran's ranking in the world science production in this field is 30 in the Scopus (with production of 0.48%), 31 in Medline (with production of 0.30%). Table 2 shows the ranking of the first 35 countries.

Table 2- The world rank of Iran, regarding the scientific production in the field of GI cancer, in Scopus and Medline databases, since 2002 to 2012

Scopus				Medline			
Rank	Country	Publications		Rank	Country	Publications	
		No.	%			No.	%
1	USA	104956	26.698	1	USA	35534	23.024
2	Japan	44631	11.353	2	Japan	23572	15.274
3	China	35446	9.016	3	China	21039	13.632
4	Germany	26976	6.862	4	Germany	8879	5.753
5	England	23900	6.079	5	England	8876	5.751
6	Italy	21226	5.399	6	Italy	7625	4.941
7	France	17050	4.337	7	Taiwan	5393	3.494
8	South Korea	12728	3.238	8	France	5161	3.334
9	Spain	11833	3.010	9	Spain	3429	2.222
10	Canada	11359	2.889	10	Netherlands	3271	2.119
11	Netherlands	9180	2.335	11	South Korea	2544	1.648
12	Australia	7622	1.939	12	Canada	2492	1.615
13	India	7573	1.926	13	Australia	2170	1.406
14	Taiwan	7466	1.899	14	India	1826	1.183
15	Swiss	5812	1.478	15	Greece	1576	1.021
16	Turkey	5590	1.422	16	Sweden	1556	1.008
17	Sweden	5445	1.385	17	Hong Kong	1476	0.956

18	Belgium	4878	1.241	18	Turkey	1460	0.946
19	Poland	4715	1.199	19	Belgium	1413	0.916
20	Brazil	4593	1.168	20	Israel	1138	0.737
21	Greece	4402	1.120	21	Swiss	1101	0.713
22	Austria	3618	0.920	22	Poland	997	0.646
23	Denmark	3138	0.798	23	Denmark	870	0.564
24	Hong Kong	2944	0.749	24	Austria	865	0.560
25	Israel	2865	0.729	25	Brazil	863	0.559
26	Norway	2117	0.539	26	Singapore	795	0.515
27	Finland	2090	0.532	27	Ireland	709	0.459
28	Singapore	2070	0.527	28	Norway	702	0.455
29	Czech Republic	1938	0.493	29	Finland	530	0.343
30	Iran	1896	0.582	30	Mexico	507	0.329
31	Ireland	1772	0.451	31	Iran	468	0.303
32	Portugal	1460	0.371	32	Thailand	452	0.293
33	Hungary	1453	0.370	33	Romania	450	0.292
34	Egypt	1424	0.362	34	Portugal	400	0.259
35	Mexico	1410	0.359	35	Czech Republic	390	0.253

Top researchers in the field of GI cancer, since 2002 to 2012: Top researchers in the field of GI cancer in the study period were Reza Malekzadeh (101 article), Mohammadreza Zali (78 article), Bita Geramizadeh (34 article), and Masood Sotoudeh (34 article) in Scopus, and Mohammadreza Zali (57 article), Reza Malekzadeh (47 article), and Seyedreza Fatemi (25 article) in Medline.

Iranian most active centers (e.g. universities, hospitals) producing the most amount of science evidences in this field: The first three ranking in Scopus database were belong to Tehran University of Medical Sciences, Shahid Beheshti University of Medical Sciences, and Shiraz University of Medical Sciences, with 667, 306 and 139 articles, respectively. Also, Tehran University of Medical Sciences (128 article), Shahid Beheshti University of Medical Sciences (46 article), and Shiraz University of Medical Sciences (39 article) were ranked one to three in Medline database.

The journals with largest share in publishing Iranian documents: Eight hundred two scientific journal indexed in Scopus database have published 1896 Iranian publications on the subject of GI cancer while 187 scientific journal in Medline database have published 468 Iranian papers in this field. The coefficient of “number of publications to number of journals” was 2.27 in Scopus database and 2.50 in the Medline database, indicating the distribution of Iranian articles in various journals. Thai journal of “Asian Pacific Journal of Cancer Prevention”, Iranian journal of “Archives of Iranian Medicine”, and Chinese Journal of “World Journal of Gastroenterology”, were ranked one to three, respectively, in both database. Table 4 lists the journals that have published the largest number of Iranian articles and include near the one third of Iranian scientific productions. According the Bradford law these journals can be considered as the core journals in the publication of Iranian researchers’ science production in the field of GI cancer (Table 3).

Evaluation of publication site in Medline database reveals that the Iranian researchers’ scientific products have been published in journals of 32 countries including USA (17.7%), United Kingdom (16.02%) and Thailand (15.6%). Also, 74 other countries have contributed in the production of information in the field of GI cancer in the Scopus database, of which, USA with release of 133 publications (20.59%), United Kingdom with 74 publications (11.46%) and France with 58 publications (8.98%) had the highest cooperation.

Table 3- The journals with largest share in publishing science products in the field of GI cancer during 2012-2002 in Scopus and Medline databases

Medline			Scopus		
No.	Journal name	Scientific Production	No.	Journal name	Scientific Production
1	Asian Pacific journal of cancer prevention : APJCP	72 (15.38%)	1	Asian Pacific Journal of Cancer Prevention	86 (4.54%)
2	Archives of Iranian medicine	37 (7.91%)	2	Archives of Iranian Medicine	80 (4.22%)
3	World journal of gastroenterology : WJG	22 (4.70%)	3	World Journal of Gastroenterology	35 (1.85%)
4	BMC cancer	11 (2.35%)	4	Hepatitis Monthly	32 (1.69%)
5	Pakistan journal of biological sciences: PJBS	10 (2.14%)	5	Journal of Research in Medical Sciences	11 (0.58%)
			6	Tehran University Medical Journal	27 (1.42%)
			7	Iranian Red Crescent Medical Journal	26 (1.37%)
			8	Gastroenterology and Hepatology from Bed to Bench	25 (1.32%)
			9	Iranian Journal of Cancer Prevention	21 (1.11%)
			10	Acta Medica Iranica	20 (1.05%)
			11	Iranian Journal of Medical Sciences	20 (1.05%)
			12	Indian Journal of Gastroenterology	19 (1.00%)
			13	Govaresh	19 (1.00%)
			14	International Journal of Hematology Oncology and Stem Cell Research	18 (1.48%)
			15	Iranian Journal of Radiology	15 (0.79%)
			16	Iranian Journal of Nuclear Medicine	15 (0.79%)
			17	Journal of Medicinal Plants	14 (0.74%)
			18	Iranian Journal of Pharmaceutical Research	14 (0.74%)
			19	BMC Cancer	13 (0.69%)
			20	Saudi Medical Journal	13 (0.69%)
			21	Journal of Gastroenterology and Hepatology Australia	13 (0.69%)
			22	Pakistan Journal of Biological Sciences	12 (0.63%)
			23	Pharmacologyonline	12 (0.63%)
			24	Pakistan Journal of Medical Sciences	12 (0.63%)
			25	Transplantation Proceedings	11 (0.58%)
			26	British Journal of Cancer	11 (0.58%)
			27	Koomesh	11 (0.58%)

Regarding determination of subject field in Medline database, 726 Mesh Major Topic keywords have been dedicated to the publications produced in Iran, which these keywords determine the main topic of discussion of publications. On average, 1.5 Mesh Major Topic have allocated for every publication. Among evaluated Mesh Major Topic keywords, keywords pathology, epidemiology, and genetics, accounted for 110, 89, and 71 publications respectively, with the highest frequency in comparison with other Mesh Major Topic keywords and the largest cooperation in determining the field of GI cancer in the Scopus database, medicine, genetics, molecular biology, and pharmaceuticals.

Discussion

The findings of present study suggest that scientific production of Iranian researchers in the field of GI cancer has growing with some fluctuations in the studied period in both Medline and Scopus databases. The study results are compatible with the study of "Biglu" (21, 22) about the situation of scientific production in various subject areas in recent years in international databases; also, the findings of the present study confirm the findings of Biglu study, in which the worlds' 40yearsscientific output was measured (23). All of these studies represent the consistent increasing trend of scientific activities of Iranian researchers in the international arena. Perhaps this is due to the continued growth of technology, access to more databases, equipping hospitals and medical centers and the increasing prevalence of the disease in recent years for some reason (such as changes in population age pyramid as the cause and change the pattern of life, poor nutrition, environmental and occupational pollutions as a contributing factor). One of the main reasons for the decrease in scientific products about GI cancer in 2012 than in 2011 in Scopus database is delayed recording and indexing of Iranian articles and scientific papers in the Scopus database. This delay can be from journals and quarter lies as well by Scopus database itself.

Regarding the rate of scientific production in the field of GI cancer, Iran ranked 31 in the world in database Scopus, ranked 30 in the world in the database Medline, and ranked 10 among Asian countries following Japan, China, Taiwan, South Korea, India, Hong Kong, Turkey, the occupying regime of Qods and Singapore. Also, in terms of scientific production, ranked 3 in the Middle East. A significant part of scientific production in the field of GI cancers have been published by researchers and specialists in medical universities of the country. Tehran University of Medical Sciences (TUMS), Tehran Shahid Beheshti University of Medical Sciences (SBMU), and Shiraz University of Medical Sciences (SUMS), have won more than 50% of the scientific production in the Scopus database with scientific production of 35.17%, 16.13%, and 7.33%, respectively. Also, SBMU, TUMS, and SUMS, have won more than 25% of the scientific production in the Medline database with scientific production of 15.17%, 6.20%, and 4.49%, respectively. These finding is compatible with the results of "knowledge & extract" study which examined the "participation of Iranian researchers in the world knowledge production in Medline", in which, SBMU, TUMS, and SUMS were diagnosed as the most active institutes in the field of scientific production in Medline database (24).

According the results of the present study and another study by Ghojzadeh et al., the most prolific researchers in Iran in the production of information in the field of GI cancer in both Scopus and Medline databases were Reza Malekzadeh, Mohammad-Reza Zali (25).

More than 70% of the Iranian top researchers in the Scopus database and more than 90% of leading researchers in the Medline database in scientific information in the field of GI cancer are belong to Tehran University of Medical Sciences, which seems to be due to presence of a specialized center for the disease (Gastroenterology and Hepatology Research Center). Also, considering the rather high H-index of prolific researchers in this field, it seems more articles by these researchers are more cited.

Asian Pacific Journal of Cancer Prevention, Archives of Iranian Medicine, and World Journal of Gastroenterology are three of the journals with the highest contribution in the publication of Iranian papers in the field of GI cancer which ranked as 1 to 3 in Scopus database (with 4.54, 4.22, and 1.85% respectively) and in Medline database (with 15.38, 7.91 and 4.70% respectively). These journals have the Impact Factor of 1.22 or more, which reflect the value of Iranian papers and accuracy of Iranian researchers in journal selection to publish their works.

This study had the advantage of being performed in both Scopus and Medline database. Medline is one of the most valid, accessible, and applicable in biomedical databases, and Scopus database was used for data collection because of including a wide range of journals in comparison with Medline database. Because a large number of research papers in the field of GI cancer are published in journals not indexed in the Medline database, using the Scopus database can overcome this limitation.

Conclusions

There is an increasing index of Iranian researches about GI cancer in both Medline and Scopus databases, so that it has increased from 11 publications in 2002 up to 413 in 2012 in Scopus database and from only 3 in 2002 up to 87 in 2012 in Medline database, presenting the growth of 37.36 fold and 29 fold, respectively.

Constituting about 25% of common malignancies in Iran, GI cancer is among the deadliest cancers among men and women in the country with high and increasing annual mortality, and it can be a potential health problems in the coming years as well.

Today, GI cancer is one of research priorities in Iranian universities and institutes. So, performing research about the disease is necessary to improve the quality of prevention, and providing effective and cost effective treatments. Scientometrics studies about the disease can reveal the situation of scientific information production in the country in order to help the scientists to easily compare their situation with others, and make better decisions about costs and time in different branches of science, and overcome their weaknesses to achieve further progress. With the current trend, it is hoped that the Iranian researchers progress with longer steps in this practice and enhance their position in the world.

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