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A Bibliometric Approach and Literature on “Oesophageal Carcinoma”

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Abstract The research paper entitled "A Bibliometric Approach and Literature on “Oesophageal Carcinoma” is a quantitative research and is particularly focused on Bibliometric analysis on “Oesophageal Carcinoma” the most dreadful and invasive type of disease which is commonly called as food pipe cancer. The esophagus is a hollow, muscular tube that connects the throat to the stomach. It lies behind the trachea (wind pipe) and in front of the spine. Oesophageal cancer is the eighth most common malignancy and the sixth leading cause of cancer-related deaths worldwide. The study revealed that the foreign countries like England is forwarding in the research output on this disease but other countries are lacking behind. The researches in the related studies are showing a decreasing trend and the growth of disease shows an incline.

Keywords: Bibliometric Analysis, Bibliometrics, Oesophageal Carcinoma, Food Pipe.

Introduction

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems. Cancer is not just one disease but many diseases. There are more than 100 different types of cancer. Most cancers are named for the organ or type of cell in which they start - for example, cancer that begins in the colon is called colon cancer; cancer that begins in melanocytes of the skin is called melanoma (**Esophageal cancer, 2015**).

Oesophageal cancer is the eighth most common malignancy and the sixth leading cause of cancer-related deaths worldwide (**Zhang, 2013**). Cancer of the oesophagus (oesophageal carcinoma) starts in the inner layers and grows outward. Oesophageal cancer is a common type of cancer that affects the tube that goes from the mouth to the stomach. The oesophagus is a part of the digestive tract. The digestive tract is made up of organs through which food and liquids pass. The oesophagus is a muscular tube that moves food and liquid from the mouth to the stomach. Normal cells in the body grow and die in a controlled way. Sometimes cells keep dividing and growing in an uncontrolled way. Other times the old or damaged cells don't die as they should. These extra cells build up over time and cause an abnormal growth called a tumor. Cancerous cells may spread to different parts of the body through blood vessels and lymph channels. Oesophageal cancer is a common type of cancer. Nearly one half million cases are diagnosed each year worldwide (**Esophageal cancer, 2015**).

The earlier oesophageal cancer is detected

and treated, the more likely are the chances of a successful treatment. Since two types of cells can line the oesophagus, there are two main types of oesophageal cancer or carcinoma: Squamous cell carcinoma and Adeno-carcinoma. The oesophagus is normally lined with squamous cells. The cancer starting in these cells is called squamous cell carcinoma. This type of cancer can occur anywhere along the oesophagus. Cancer that starts in the gland cells are called Adeno-carcinoma, this type of cell is not normally part of the inner lining of the oesophagus (**Mayer, 2008**).

Causes or Risk factors:

It is usually impossible to specify the cause of cancer in an individual patient. However, doctors know factors that can increase the chances of getting cancer. These are known as “risk factors”:

- Smokers are more likely than non-smokers to develop esophageal cancer.
- Drinking more than three alcoholic drinks a day increases your risk.
- Having a diet low in fruits and vegetables may increase the risk of esophageal cancer.
- Obesity increases the risk for esophageal cancer.
- Age is a risk factor for esophageal cancer. People between 45 and 70 years of age are at the highest risk. Also, men are more likely than women to develop oesophageal cancer.
- Acid reflux increases your risk. Acid reflux is a very common condition that

can damage the tissue in the oesophagus. Acid reflux is the abnormal backward flow of stomach acid into the oesophagus.

- Having Barrett oesophagus can increase your risk of oesophageal cancer. Barrett oesophagus is when cells in the lower part of the oesophagus have changed or been replaced with abnormal cells. It can be caused by acid reflux. Not everybody who has risk factors for oesophageal cancer develops oesophageal cancer. Some people who have no risk factors for oesophageal cancer can still develop the cancer (**Esophageal cancer, 2016**).

Symptoms:

- Difficulty swallowing (dysphasia).
- Weight loss without trying.
- Chest pain, pressure or burning.
- Frequent choking while eating.
- Indigestion or heartburn.
- Coughing or hoarseness (**American Cancer Society, 2016**).

The work in this paper is a small step towards the quantitative research of Oesophageal Carcinoma. In which the analysis of research from worldwide, geographical distribution, authorship pattern, quality of research, areas of publication, areas of excellence and the high priority areas of this subject are taken in consideration. This small step of research will provide guidelines and Birdseye view for the researchers in the field of research in Oesophageal Carcinoma and the need of hour leads us to the need of research. The necessity of Bibliometrics leads us to this research paper and the results will be fruitful for researchers, students and other users.

Statement of Problem

The present age is the information age. Thousands of bites of information is being added at every moment to the world of knowledge. Due to the research and developmental activities, the literature in all the subject fields is increasing at an alarming speed. The extraordinary power of the internet to disseminate the information, to make the research results available to other researchers in every part of the world has greatly affected the way information is being perceived and used. These blessings on the other hand, have posed some major challenges to the users like information influx, inability of the users to refer to the relevant sources of information, difficulty in identifying the potential contributors in a specific discipline etc. These factors are the major determinants of the quality of the one's research.

The present study in this regard is an endeavor to quantify the world scientific output in one of the areas of medical sciences concerning one of the dreadful disease i.e. Oesophageal Carcinoma, which is commonly known as food

pipe cancer. The main purpose of the study is to analyze and highlight the research activity and the trend with which the research is being done on the said disease globally, by applying various bibliometric techniques to the published literature.

Objectives of the Study

Following are the objectives of this study:

- I. To identify the primary sources of literature.
- II. To determine the yearly distribution of articles.
- III. To identify country of publication.
- IV. To identify language of publication.
- V. To calculate growth rate of articles in terms of literature.

Scope of the Study

The scope is confined to the research output of the global level concerning one the dreadful disease in medical sciences, known as Oesophageal Carcinoma. The study is limited to major indexing and abstracting service, i.e. Pubmed. The study undertakes several quantitative bibliometric analysis of the publications of the period of 20 years (1994 to 2014).

Methodology

The data for the study is based on the Pubmed, which is the National Library of Medicine's (NLM) premier database of scholarly citation, covering nearly 4500 journals published in the United States and more than 70 other countries. New citations are added weekly as this database is more current than MEDLINE. This database was searched by using keyword, Oesophageal Carcinoma and is confined to publication years from 1994 to 2013. Since the database use different terminology to index different fields e.g. title, keyword. Accessing Pubmed, a total of 234 records or results were retrieved. Among them, 211 are journal articles and 21 are reviewed articles and only one among them is historical article.

The data as per the laid objectives is obtained and collected from these records. The study mostly depends on the data furnished by Pubmed. To determine the country of publication of journals in which the authors had published their work, Scimago database was consulted. The Scimago journal and country place is a portal that includes the journals and country scientific indicators developed from the information contained in the PUBMED. The data thus collected was tabulated in MS-Excel and analyzed and presented in different tables and proper dimension was added for major results therein.

Literature Review

Tremendous amount of studies and

research have been done on the topic Oesophageal Carcinoma and its related domains, which forms a huge amount of literature on the subject. Simultaneously good numbers of authors from various countries and regions have been working on these domains and various other issues of Oesophageal Carcinoma. These studies provide a great platform, in order to examine and analyze the geographical distribution, authorship pattern, quality of the study and other important trends of publications and to identify the areas of excellence and the high priority areas of this subject. In order to highlight the literature and quantitative approach of the work that has been done over the past years, bibliometric statistics tools are being used to evaluate and examine the work. Bibliometrics is becoming an important part of information research and a quantitative approach to the description of documents and examination of services, both in research and practice. Bibliometrics is an emerging thrust area of research from different branches of human knowledge (Chaurasia, 2008). Bibliometrics has emerged as handy tool to study collection evaluation and building, ranking of journals, identification of core literature, to know the structure of literature, to know the prolific authors to observe the obsolescence of literature, to study user behaviour and forecast their further needs (Satija, 2004).

Researchers use bibliometric methods of evaluation to determine the influence of a single writer, for example, or to describe the relationship between two or more writers or works, or to identify the pattern of publication and authorship, citations used for a subject etc. over a period of time.

Falagas, Papastamataki & Bliziotis, (2006) has conducted a bibliometric study to estimate the research productivity of different world regions in the field of Parasitology. By using PubMed database, articles from various journals were retrieved on Parasitology and research productivity was evaluated based on a methodology which was developed and then used in other bibliometric studies by analyzing: (1) the total number of publications, (2) the mean impact factor of all papers and (3) the product of the above two parameters, (4) the research productivity in relation to gross domestic product of each region, and (5) the research productivity in relation to gross national income per capita and population of each region. Western Europe exceeds all world regions in research production for the period studied (34.8% of total articles), with USA ranking second (19.9%), and Latin America & the Caribbean ranking third (17.2%). The mean impact factor in articles published in Parasitology journals was highest for the USA (1.88). Oceania ranked first in research productivity when adjustments for both the gross national income per capita (GNIPC) and population were made. Eastern Europe almost tripled the production of articles from only 1.9% of

total production in 1995 to 4.3% in 2003. Similarly, Latin America and the Caribbean and Asia doubled their production. However, the absolute and relative production by some developing areas, including Africa, is still very low, despite the fact that parasitic diseases are major public health problems in these areas. (Wang, et-al, 2013) performed a bibliometric analysis of published research on Global Positioning System (GPS) for the period of 1991–2010, based on the Science Citation Index and Social Sciences Citation Index databases. The search identified a total of 15,759 GPS-related publications in the period and analyzed the patterns of publication outputs, subject categories and major journals, international productivity and collaboration, geographic distribution of authors, and author keywords. The annual number of publications in GPS research increased from 98 in 1991 to 1934 in 2010. "Geochemistry & Geophysics", "Geosciences, Multidisciplinary", and "Engineering, Electrical & Electronic" were the top 3 most popular subject categories. As the flagship journal in the field, Geophysical Research Letters had the highest publication count. The USA, the UK and Germany were the top 3 most productive countries. The most productive institution was the California Institute of Technology (Caltech), followed by the Chinese Academy of Sciences and the University of Colorado. The USA was the most frequent partner in international collaborations. Caltech took the central position in the collaboration network. The major spatial clusters of authors were in the USA, the Europe Union, and East Asia (including China, Japan and South Korea). "Ionosphere", "Remote Sensing" and "Monitoring" are growing research subjects in the field of GPS, while "Deformation", "Geoid" and "Tectonics" are becoming gradually less significant. This bibliometric study revealed underlying patterns in scientific outputs and academic collaborations and may serve as an alternative and innovative way of revealing global research trends in GPS.

Using the method of bibliometrics, a 1999-2002 biochemistry and molecular biology database was constructed for China from the Science Citation Index Expanded (SCI-Expanded). Based on this database, the author quantitatively analyzed the current research activity in biochemistry and molecular biology in China. Results show that almost half the publications were published in Chinese journals. The percentage of articles published by Chinese authors in the total articles from the world is increasing. The number of articles published in high influence journals is continuously increasing. The research outputs are mainly located in Beijing, Shanghai and Hong Kong. The sites of the China Science Academy and National Universities are the important locations for these studies. The collaboration rate of Chinese output is low as compared to results from other countries. USA and Japan are the main

international collaborating countries (Tianwei, Zhang &Teng, 2005)

Ortiz, et-al (2009) conducted a bibliometric study to present the characteristics and trends of cancer publications in Puerto Rico's biomedical journals and their relationship with the island's cancer mortality. A PubMed and a hard-copy search were performed to retrieve cancer-related articles published in the Puerto Rico Health Sciences Journal and the Boletn de la Asociacion Médica de Puerto Rico from 1903 to 2005. Bibliometric indicators studied included the number of authors and references by article, first author's institutional affiliation and country, document type, and language. The study type and tumor classification were also recorded. Cancer proportional mortality (M%) in Puerto Rico and the proportion of cancer-related articles (P%) published were also evaluated. The annual percent change (APC) was estimated to assess trends. A total of 369 articles were retrieved. The institutions with the majority of publications were universities (39.6%), English was the predominant publication language (72.1%), and the principal document type was original papers (69.6%). Epidemiologic studies were the dominant study type (62.1%), and the most studied cancers were digestive (15.4%) and gynecologic (9.6%). Although the P% has increased since 1913 (APC = 1.2%), the M% increased at a faster pace (APC = 2.7%) although a growth in the number of cancer publications is observed in these journals, it does not parallel the increase in proportional mortality.

Patra, Bhattacharya &Verma(2006) analyzed the growth pattern, core journals and authors' distribution in the field of bibliometric using data from Library and Information Science Abstracts (LISA) and found that growth of literature does not show any definite pattern.

Data Analysis

A careful interpretation and analysis of data gathered reveals that the study period from (1994 to 2014), in which a total of 234 articles are published. The published journal are of primary nature and are used as research work by authors. Among these 234 articles, 211 are journals articles, 21 are reviewed articles and only one is historical article and all are published in 6 different languages, from 26 different countries.

The data has been analyzed under the following different headings:

- 1 **Primary sources of literature.**
- 2 **Yearly distribution of publications.**
- 3 **Country of publications.**
- 4 **Language of publications.**
- 5 **Growth rate of publications.**

Primary sources of literature:

Table (1) shows the primary sources of literature, published by authors in different languages, during

the period from 1994 to 2014. And in this period, a total of 234 primary sources of literature were retrieved. Among these all primary sources, 211 are journal articles and 21 are reviewed articles, only one among these is historical article. Thus authors have frequently used journal articles to publish their research work.

Table 1:Shows primary sources of literature:

S. no.	Type of publication	No. of publications
01	Journal articles	211
02	Reviewed articles	21
03	Historical article	01

Yearly Distribution of Publications:

Yearly Distribution of Publications (Journal Articles)

Table (2) shows the year wise distribution of publications of journal articles, during the period from 1994 to 2014. Authors have published a total of 233 primary sources of literature, during this period of 20 years. Among them, 211 are the Journal Articles. In this period, maximum of 18 publications are from the year 2005 and minimum of 4 publications are seen in the year 2004. In the beginning year 1994, a minimum growth has been observed in the publications, while as in the years 1995, 2000, 2006 and 2010, there has been a positive growth in the publications. But over all, there has been a dip in the publication of journal articles in these 20 years.

Table 2: Shows yearly distribution of Journal Articles related to Oesophageal Cancer:

S. No.	Year	No of articles related to Oesophageal Carcinoma
1	1994	5
2	1995	13
3	1996	14
4	1997	14
5	1998	10
6	1999	10
7	2000	15
8	2001	11
9	2002	15

S. No.	Year	No of articles related to Oesophageal Carcinoma
10	2003	8
11	2004	4
12	2005	18
13	2006	5
14	2007	13
15	2008	7
16	2009	9
17	2010	7
18	2011	10
19	2012	9
20	2013	6
21	2014	8
Total		211

Yearly Distribution of Publications (Review Articles):

Table (3) shows the year wise distribution of reviewed articles during the period from 1994 to 2014. As the authors have published a total of 233 primary sources, in which they have published their research work. Among them, only 21 are the Reviewed Articles. In this period of 20 years, maximum of 3 publications each are seen in the years 2009, 2011 and 2012 separately and no publications are seen in the years 1995, 1999, 2000, 2001, 2002, 2003, 2004 and 2013 but in the starting years, there has been slight growth in the publications of reviewed articles, but in the years from 2009 to 2012, there has been a good growth in the publication of reviewed articles. Thus, there has been a positive growth of publications of reviewed articles in these 20 years.

Table 3 shows yearly distribution of Review Articles related to Oesophageal Cancer:

Sr. No.	Year	No. of review articles related to Oesophageal Carcinoma
1	1994	1

Sr. No.	Year	No. of review articles related to Oesophageal Carcinoma
2	1995	0
3	1996	1
4	1997	1
5	1998	1
6	1999	0
7	2000	0
8	2001	0
9	2002	0
10	2003	0
11	2004	0
12	2005	2
13	2006	1
14	2007	1
15	2008	1
16	2009	3
17	2010	2
18	2011	3
19	2012	3
20	2013	0
21	2014	1
Total		21

Country of Publications:

Country of Publications (Journal Articles)

Table (4) shows the country of publication of the articles, in which the authors have published their work and findings. Authors have used a total of 233 primary sources of literature and among them 211 are journal articles, 21 are reviewed articles and only a single is historical article, which are being published from 26 different countries. Maximum of 144 publications are from the country of England and only a single publication each from different countries: Hungary, Kenya, Bosnia and

Herzegovina, Austria, Czech Republic, Finland, Serbia, Serbia, Spain and China.

Table 4: Shows Country of Publication of Journal Articles:

S. No.	Country	No. of Articles Published
1	England	13
2	Australia	02
3	France	02
4	Serbia	01
5	Nigeria	01
6	Singapore	01
7	Finland	01
	Total	21

S. No.	Country	No. of Articles Published
1	India	04
2	Germany	14
3	England	130
4	Netherlands	06
5	Poland	03
6	Egypt	01
7	Italy	03
8	Serbia	01
9	Nigeria	02
10	France	03
11	United States	03
12	Australia	09
13	Ireland	05
14	China	01
15	Switzerland	02
16	Singapore	05
17	Czech Republic	01
18	Greece	07
19	Spain	01
20	Bosnia Herzegovina	01
21	Austria	01
22	Scotland	03
23	South Africa	02
24	Hungary	01
25	Kenya	01
26	Finland	01
	Total	211

Country of Publications (Review Articles)

Table (5) shows that among the 21 Reviewed Articles, 13 are from England, 2 articles each from Australia and France and only a single reviewed article each from Serbia, Nigeria, Singapore and Finland.

Only a single Historical article has been published from England on September, 2004.

Table 5: Shows Country of Publication of Review Articles:

Publications (Journal Articles)

Table (6) shows the language of journal articles, in which the authors have written their research work. Authors have made use of 6 different languages. Among them, English has been widely used in publication of articles, publishing total of 204 journal articles, followed by publishing 03 articles in French, publishing single article each in Serbian, Spanish, Czech and Polish.

Table 6: Shows Language of Journal Articles:

S.No	Language	No of j articles published
1	English	204
2	French	03
3	Spanish	01
4	Serbian	01
5	Czech	01
6	Polish	01
Total		211

Language of Publications (Review Articles)

Table (7) shows the language of reviewed articles, publishing 18 articles in English, 2 in French and only single in Serbian language.

Table 7: Shows Language of Review Articles:

S.No	Language	No. of review articles published
1	English	18
2	French	02
3	Serbian	01
Total		21

Growth Rate of Publications:

Growth Rate of Publications (Journal Article)

Table (8) shows the growth rate of publications of journal articles from the years 1994 to 2014. During this period of 20 years, a positive growth of 78% of articles has been found in the year 2005, while negative growth of -260% of articles has been found in the year 2006. Over all, there has been a negative growth rate of 18% in the publication of journal articles.

Table 8: Shows Growth Rate of Journal Articles:

S.No.	Year	Growth %
1	1994	0%

2	1995	62%
3	1996	7%
4	1997	0%
5	1998	40%
6	1999	0%
7	2000	33%
8	2001	36%
9	2002	27%
10	2003	88%
11	2004	-100%
12	2005	78%

13	2006	-260%
14	2007	62%
15	2008	-86%
16	2009	22%
17	2010	-29%
18	2011	30%
19	2012	-11%
20	2013	-50%
21	2014	25%
Total		-18%

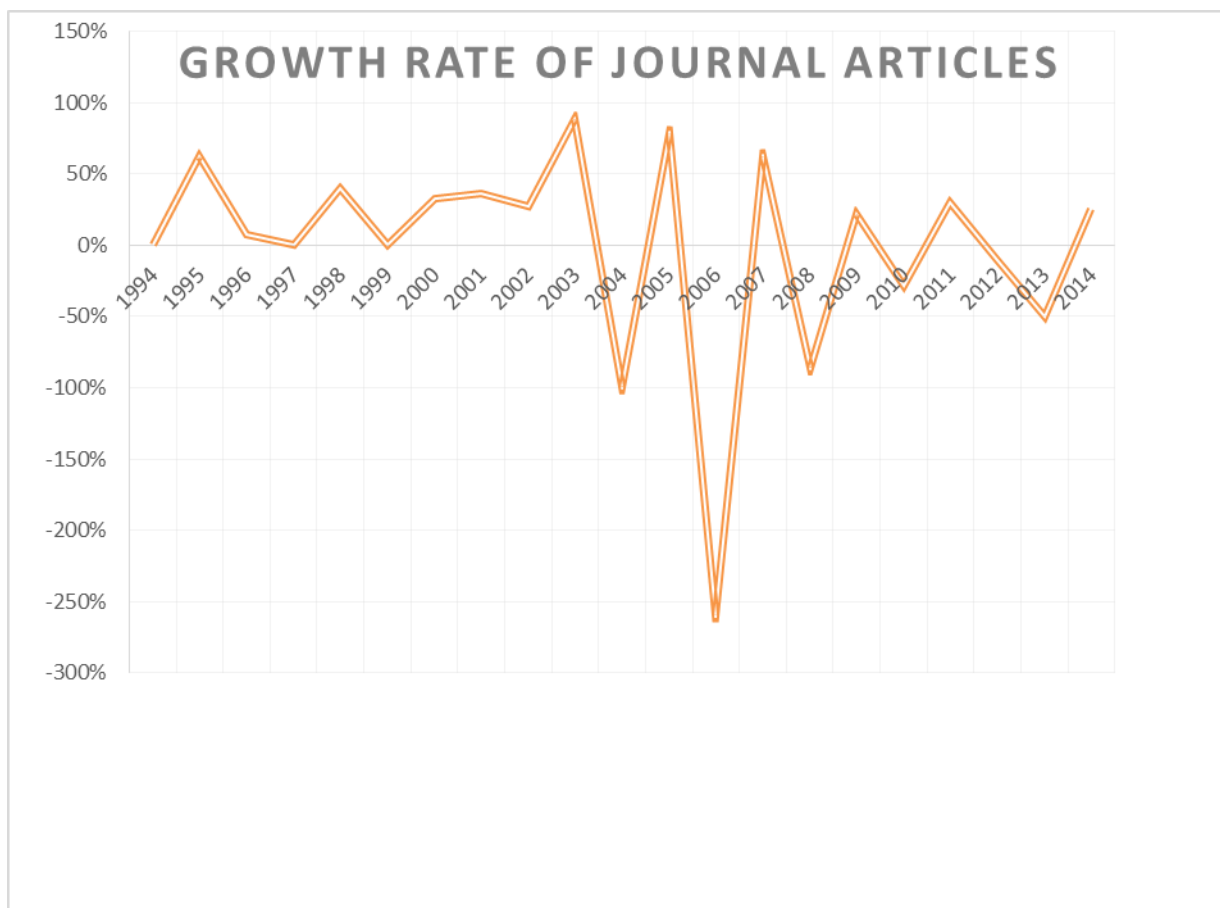


Fig: 1

Growth Rate of Publications (Review Articles)

Table (9) shows the growth rate of publications of Reviewed articles from the years 1994 to 2014. During this period of 20 years, a positive growth of 100% of articles has been found in the years 1996, 2005 and 2014 while negative growth of -100% of articles has been found in the year 2006. Over all, there has been a positive growth rate of 12% in the publication of the reviewed articles. Only a single Historical Article has been published from 1994 to 2014.

Table 9: Shows Growth Rate of Review Articles:

S. No.	year	Growth%
1	1994	0%
2	1995	0%
3	1996	100%

S. No.	year	Growth%
4	1997	0%
5	1998	0%
6	1999	0%
7	2000	0%
8	2001	0%
9	2002	0%
10	2003	0%
11	2004	0%
12	2005	100%
13	2006	-100%
14	2007	0%
15	2008	0%

S. No.	year	Growth%
16	2009	67%
17	2010	-50%
18	2011	33%
19	2012	0%

S. No.	year	Growth%
20	2013	0%
21	2014	100%
Total		12%

Fig: 2



Data Analysis and Interpretation:

Careful interpretation and analysis of data gathered after reveals that:

- ✓ During the study period from 1994 to 2014, a total of 234 primary sources of literature has been published and used by authors to publish their research work. From these 234 primary sources, 211 are journal articles, 21 are reviewed articles and only a single one is historical article.
- ✓ During this period of 20 years, there has been a good number of journal articles published in the beginning years, with the maximum of 18 articles published in the year 2005, followed by 15 articles in the year 2002, 14 articles each in 1996 and 1997 and 13 each in 1995 and 2007. Then 11, 10 & 9 number of articles in the years 2001, 2011 & 2009 respectively. Then 8 numbers of articles each in 2003 & 2014 and 7 number of articles each in 2008 & 2010, then 6 number of articles in the year 2013 and 5 no. of articles each in 1995 and 2006 and minimum of 4 articles published in 2004. Thus there has been decrease in the number of publications in these 20 years. Also there has been a minimum publication of reviewed articles in the starting years but at the ending years, there has been an improve in the number of publications of reviewed articles, that indicated increase in the publication of reviewed articles in these 20 years.

- ✓ The articles published by authors in these 20 years, have been published from 26 different countries. Among the total of authors, maximum are from the country of England, who had published 144 articles on the subject. Followed by Germany publishing 14 articles and 11 from Australia, with 6 articles from Greece, 5 from France and 4 articles each from the country of India, Netherland & Singapore and 3 each from Ireland, United States & Italy. Poland, Nigeria, Switzerland, South Africa and Scotland published 2 articles from every country and only a single article, each from China, Spain, Serbia, Kenya, Hungary, Bosnia & Herzegovina, Austria, Finland and Czech Republic.
- ✓ Authors have published their research work in total of 233 primary sources of publications, maximum of 222 articles among them are in English language, followed by French language having 5 publications, Serbian with 2 publications and single publications each from languages, Spanish, Polish & Czech. Authors had mostly published their work in the primary sources and among them they had mostly used Journal Articles to report their research findings.
- ✓ “The British Journal of Surgery” from England has published most number of articles, among all these 233 publications.

Suggestion

The study on the topic “Literature on Oesophageal Carcinoma” reveals that good amount of research has been done by country England but other countries are behind in this field. As this disease of food pipe is dangerous and spreading at an alarming pace in developing as well as developed countries, so need of an hour is that efforts should be taken into consideration, so as to find a good cure for this disease and research should be done on every aspect of this type of cancer, from every corner of the world.

Conclusion

This study is based on the title” Literature on Oesophageal Carcinoma” which reveals that the country of England is forwarding in the research output on this disease but other countries are lacking behind. Thus from the study, it is to be concluded that the research in the related disease is showing a decreasing trend, while as the growth of disease shows an incline

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