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A SCIENTOMETRIC STUDY ON DIABETIC GASTROPARESIS

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Abstract:
The present study is based on the Scientometric analysis of 169 research article published in different journals on PubMed database during the period of 2009-2018.This Study will review on Journal wise distribution, year-wise distribution, Authorship pattern of contributions, Author wise distribution, country-wise distribution, Relative Growth Rate and doubling time for publications, Length of Article's title wise distribution, number of pages, Type of document, Institution wise distribution, No. of reference- print as well as web reference. The findings must reveal various aspects of the characteristics and patterns of contributions of the study.

Keywords: Scientometrics, Diabetic Gastroparesis.

1. INTRODUCTION:

Scientometrics is nothing but the study of quantitative aspects of Science. Wikipedia defines "Scientometrics is the science of measuring and analyzing science". Practically, scientometrics is the study of scientific literature by applying bibliometric and statistical techniques.According to Nalimov and Mulchenko (1969),scientometrics is the "the application of those quantitative methods which are dealing with the analysis of science viewed as an information process".Now a day's Scientometric is one of the truly interdisciplinary research fields extended to almost all scientific fields. Scientometric applications are used to measure scientific activities, mainly by producing statistics on scientific publications indexed in databases. Scientometrics is the branch of science that describes the output traits in terms of organizational research structure, resource inputs and outputs, develops benchmarks to evaluate the quality of information output.

2. DEFINATIONAL ANALYSIS:

2.1 Scientometrics: According to Tague-Sutcliffe (1992), Scientometrics is "the study of the quantitative aspects of science as a discipline or economic activity".Thus, Scientometrics concerned with the quantitativefeatures & characteristics of science.

2.2 Scientometric Analysis: According to (2006), wouters, a cart intension has always existed between academic Scientometrics and political/practical, Scientometrics, the letter of which has been described as a hybrid of social science and bur rerate expertise (2006)

3. PUB MED:

PubMed is a free search engine accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics. The United States National Library of Medicine (NLM) at the National Institutes of Health maintains the database as part of the Entrez system of information retrieval.From 1971 to 1997, MEDLINE online access to the MEDLARS Online computerized database primarily had been through institutional facilities, such as university libraries. PubMed, first released in January 1996, ushered in the era of private, free, home- and office-based MEDLINE searching. The PubMed system was offered free to the public starting in June 1997.

PubMed comprises more than 29 million citations for biomedical literature from MEDLINE,life science journals, and online books.Citations may include links to full-text content from pubMed central and publisher web sites.PubMed provides access and links to the integrated molecular biology databases maintained by the National Center for Biotechnology Information (NCBI). These databases contain DNA and protein sequences, 3-D protein structure data, population study data sets, and assemblies of complete genomes in an integrated system. Additional NLM bibliographic databases, such as AIDSLINE, are being added to PubMed. PubMed includes "Old Medline." Old Medline covers 1950-1965. (Updated daily)

4. Review of Literature

In recent years, many researchers have conducted Scientometric analysis in different subject fields.

Signore & Annovazzi (2004) carried out a research on Medline covering a 1-year period to evaluate the number and the scientific “weight” of the Nuclear Medicine papers published from European as compared with other countries. They found that Europe leads research in Nuclear Medicine (939 papers, 38.9%) followed by the U.S.A (608 papers, 25.2%). Among European countries, Germany is the nation that is currently making the greatest contribution to the scientific production of Nuclear Medicine in Europe.

Pradhan, Panda and Chandrakar (2011) the study presents the trends in authorship pattern articles downloaded from SCI-Expanded database in Web of Science during the period 2000-2009. The average number of authors per article is 3.55 %. In the study the degree of collaboration (C) during the overall 10 years (2000-2009) is 0.03, but the year wise degree of collaboration is almost same in all the years of mean value 0.97. In the 10 years of period, the multi-authorship articles are higher and predominant on single authorship. The study found that the researchers in chemistry are keen towards team research or group research rather than solo research.

Khaparde (2013) the paper studied the Bibliometric Analysis of Research Publication of Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, from 1975 to 2012. It analyzed all the 774research publications from the 144 journals. It examines year- wise distribution of papers, authorship pattern, journal in which author publish, it revealed that the number of publications has increased consistently from the year 1975 to the year 2012. 25% of the total publications have been made in 2009, 2010, and 2011. And the majority of the publications are made with 4 authors. And also the majority of the research paper published in journal of heterocyclic chemistry.

Khaparde & Pawar (2013) studied the authorship pattern and author’s collaborative research in Information Technology with a sample of 17917 articles collect from LISA during 20002009.The average number of authors per article is 1.80. In the study the degree of collaboration (C) during the overall 10 years (2000-2009) is 0.71 but the year wise degree of collaboration is almost same in all the years of mean value 0.49. According to 10 years of period, the multi- authorship articles are higher and predominant on single authorship. The study found that the researches in Information Technology are keep toward team research or group research rather than solo research.

Tupe S.K & Khaparde V.S, (2016) The Present study deals a Scientometric analysis of 4813 references appended to 217 articles contributed by the authors in Information Technology and Libraries on DOAJ. during the period of 2005-2014.The study examines Authorship Pattern, Relative Growth Rate and Doubling Time of Articles, Year wise degree of collaboration It is seen that the single authorship trend in increasing. The study revealed that most of the articles (57.14%) of articles were contributed by single authors. USA is the top producing country with 178 (82.03%) publications of the total output. The mean relative growth rate for the last five years 2010 to 2014 reduced to (0.13). While the Doubling time for different years [DT(p)]gradually increased from (1.00) in 2006 to (7.70) in 2014. The mean doubling time for the first five years (i.e. 2005 to 2009) is only (1.69) which is increased to (5.69) during the last five years (2010 to 2014). The maximum references used print references i.e.3154 whereas 1659 references were web references.

5. Objectives of the Study:-

***The following objectives have been formulated for the present study. The objectives of the study are to determine the following*:**

1. To study the Journal wise distribution of articles
2. To study the year-wise distribution of articles
3. To find out the authorship pattern in the publication
4. To study the Author's Ranking of publication
5. To estimate the Collaborative Index (CI) of publication
6. To find out country-wise distribution of articles
7. Relative Growth Rate [r (a)] And Doubling Time [dt (a)] For Publications
8. To identify the length of page per article
9. Type of document wise distribution of article
10. To find out Institution wise distribution of publication
11. To find out the reference of the article (Print as well as Web).

Diabetic Gastroparesis –

Gastroparesis is a disease of muscles of the stomach or the nerves controlling the muscles that causes the muscles to stop working. Gastroparesis results in inadequate grinding of food by the stomach and poor emptying of food from the stomach into the intestine. Gastroparesis may be associated with paralysis of the small intestine and colon. The most common underlying cause is diabetes mellitus. Gastroparesis is diagnosed via gastric emptying study. It is usually treated with medications that stimulate the stomach muscle to contract.

Over time, diabetes can affect many parts of your body. One of those is the vagus nerve, which controls how quickly your stomach empties. When it's damaged, your digestion slows down and food stays in your body longer than it should.This is a condition called gastroparesis. It can make you feel queasy and vomit. It's also bad for your blood sugar levels.Although it's more common in people with type 1 diabetes, people with type 2 can also get it.Most people with gastroparesis have had diabetes for at least 10 years and also have other complications related to the disease.

6. Hypothesis: ***The following hypotheses are formulated for the present***

1. USA is the high productive country.
2. Majority of the references are print references.

7. Scope and Limitation of the Study:

The present study is based on the A Scientometrics profile of Diabetic Gastroparesis in PubMed Database. The present study is based on overall 169 contributions during 2009-2018.

8. Data Collection:

Data can be numerically expressed that is quantified quantifiable or objective (Fasibs off and Dely, 1990) the data was collected from, PubMed with the help of excel. Total 169 articles during 2009-2018.

9. Data Analysis and Interpretation:

Scientometrics analysis is a branch of bibliometrics. It is an important research tools for understanding of the subject it aims at measuring the utility of documents and relationship between documents and fields.The present study is based on the Scientometric profile of Diabetic Gastroparesis in Pub-Med database during 2009-2018 total 169 Contributions are studied.

- ***The Journal wise distribution of articles***

Sr. No.	Journal Title	Total Articles	Percentage%
1	NIH public access	49	28.99
2	World J Gastroenterol	14	8.28
3	Journal NeurogastrointestinalMotil	6	3.55
4	Gastroenterol Res	5	2.96
5	J Gastrointestin Liver Dis	5	2.96
6	BMJ Case Report	4	2.37
7	Cellular and Molecular Gastroenterology and Hepatology	3	1.78
8	Gastroenterology &Hepatology	3	1.78
9	Journal of Diabetes Science and Technology	3	1.78
10	Am J PhysiolGastrointest Liver Physiol	2	1.18
11	British Journal of Pharmacology	2	1.18
12	AdvTher Journal	2	1.18
13	Diabetes care	2	1.18
14	Diabetes Ther	3	1.78
15	Electronic Physician	2	1.18
16	Evidence-Based Complementary and Alternative Medicine	2	1.18
17	Gastroenterology Research and Practice	2	1.18
18	Indian J Endocrinol Metab	2	1.18
19	Journal of Diabetes Research	2	1.18
20	The Review of Diabetic study	2	1.18
21	World Journal of Diabetes	2	1.18
22	Single time Journals	52	30.77
	Total	**169**	**100.00**

Table No. 01 the Journal wise distribution of article

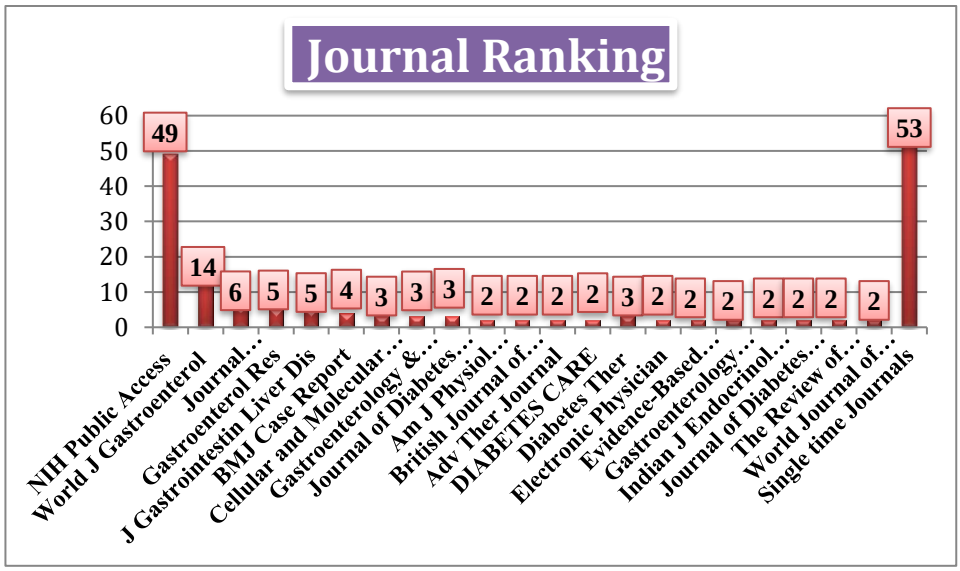


Figure No. 01Journal wise distribution of articles

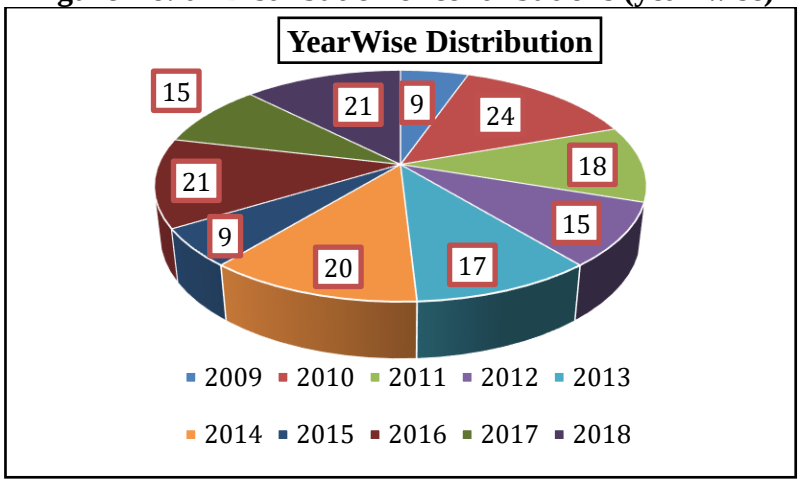
This table no. 01 shows the distribution of Journals, The highest numbers of journal is Nih Public Access Journal i.e. 49 (28.99%) Then World journal Of Gastroenterol i.e. 14 (8.28%) and 53 (31.36%) are Single time Journals.

- ***Year-Wise Distribution of Contributions***

Table No. 02: Year-Wise Distribution of Contributions

Sr. No.	Year	Frequency	Percentage
1	2009	9	5.33
2	2010	24	14.20
3	2011	18	10.65
4	2012	15	8.88
5	2013	17	10.06
6	2014	20	11.83
7	2015	9	5.33
8	2016	21	12.43
9	2017	15	8.88
10	2018	21	12.43
	Total	**169**	**100.00**

Figure No. 02 Distribution of contributions (year-wise)



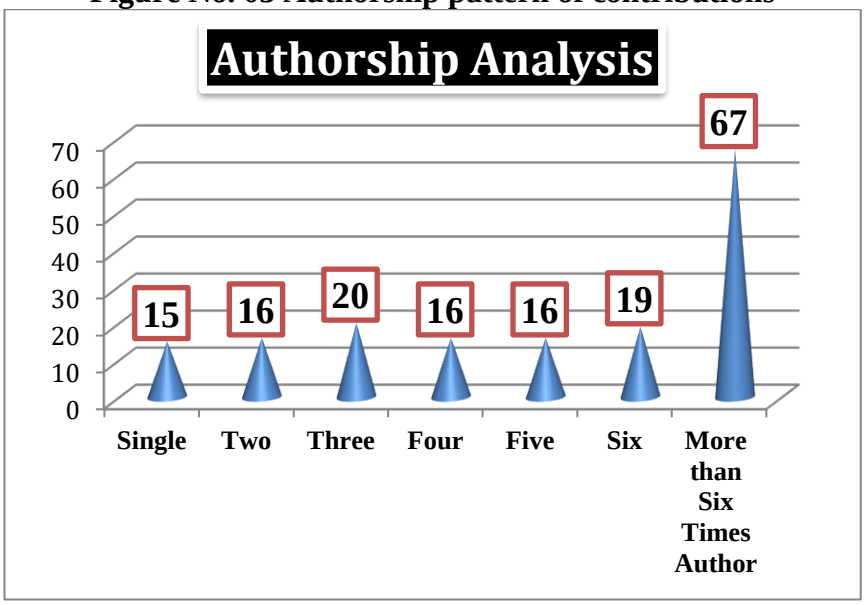
It can be observed from the table No. 02 & Figure no. 02 out of the total 169 contributions majority of the contributions i.e. 24 contributions were contributed in 2010 were as minimum contributions i.e. 09 contributions were contributed in 2009 & 2015.

- ***Authorship pattern of contributions***

Table No.03: Authorship pattern of contributions

Sr. No.	No. of Authors	Frequency	Percentage (%)
1	Single Author	15	8.88
2	Two Authors	16	9.47
3	Three Authors	20	11.83
4	Four Authors	16	9.47
5	Five Authors	16	9.47
6	Six Authors	19	11.24
7	More than Six Times Author	67	39.64
	Total	**169**	**100.00**

Figure No. 03 Authorship pattern of contributions



This Table No. 03 shows the authorship pattern of the papers published during the period of study. The highest numbers of articles had been published by three authors i.e. 20. This is followed by 19 authors in six authors. The minimum numbers of authors is single author of 15.

- ***Author Ranking of article***

Table no. 04 Author Ranking of article:This table shows Most Productive Author

Sr. No.	Author Name	Frequency	Percentage%
1	Henry P. Parkman	8	4.73
2	Michael Camilleri	4	2.37
3	Adil E. Bharucha	3	1.78
4	SimmonJ.Gibbons	3	1.78
5	P. R. R. GANGULA	3	1.78
6	Andrea S. Shin	2	1.18
7	FatemehMahjoub	2	1.18
8	Julia Borg	2	1.18
9	Kyoung Moo Choi	2	1.18
10	Madhusudan Grover	2	1.18
11	Purna C. Kashyap	2	1.18
12	S.Gopinath	2	1.18
13	KalpanaRavella	2	1.18
14	One time Author	132	78.11
	Total	**169**	**100.00**

It can be observed from Table No.04 that, the most productive authors are Henry P. Parkman who had contributed 8 Articles (4.73%).Then followed by Michael Camilleri Contributed 4 articles (2.37%). The One time published Author is 132 (78.11 %)

- **5. Collaborative Index (CI) of publication**

This is one of the early measures of degree of collaboration derived by Lawani (1980).

$$CI = \frac{\sum Aj=1jfi}{N}$$

It is a measure of mean number of authors. Although it is easily computable, it is not easily interpretable as a degree, for it has no upper limit. Moreover; it gives a non-zero weight to single-authored papers, which involve no collaboration.

CI = [(f1) 1 + (f2) 2 + (f3) 3 + … (fk) k] / N

Using data in the Table 4.18, during 2009-2018,

Table No.05 Collaborative Index of Publication

Year	Single	Two	Three	Four	Five	Six	> Six Author	Total Article	Total authors	*CI*
2009	0	2	6	0	10	18	0	9	36	5.14
2010	4	6	12	4	5	18	74	24	123	5.84
2011	1	4	3	8	0	12	120	18	148	6.5
2012	4	2	9	8	0	0	69	15	92	5.98
2013	0	6	3	0	25	0	62	17	96	6.04
2014	0	4	3	24	15	6	64	20	116	5.31
2015	1	0	3	8	5	18	19	9	54	5.7
2016	3	2	3	4	10	12	84	14	118	6.28
2017	1	0	3	4	5	6	97	21	116	6.6
2018	0	4	9	4	5	24	152	22	198	6.48
Total	**14 (1.27)**	**30(2.71)**	**54(4.90)**	**64(5.80)**	**80(7.25)**	**120(10.88)**	**741(67.18)**	**169**	**1103**	**6.16**

Table 05 shows the variation in the CI. It varies from 5.14 in 2009 lowest CI in the year 2015 i.e. 5.7 and highest Collaboration we can notices in 2018 i.e. 6.48 this may be due to the geographical or environmental factors of the organization. Final total Collaborative Index is 6.16.

- ***Geographical distribution of the article***

Table No. 06. – Geographical distribution of the article

Sr. No.	Name of Country	Frequency	Percentage%
1	USA	62	36.69
2	China	19	11.24
3	United Kingdom	10	5.92
4	India	6	3.55
5	Sweden	5	2.96
6	Iran	4	2.37
7	Italy	4	2.37
8	Germany	2	1.18
9	Korea	2	1.18
10	New York	2	1.18
11	Romania	2	1.18
12	South Korea	2	1.18
13	One time Country	49	28.99
	Total	**169**	**100.00**

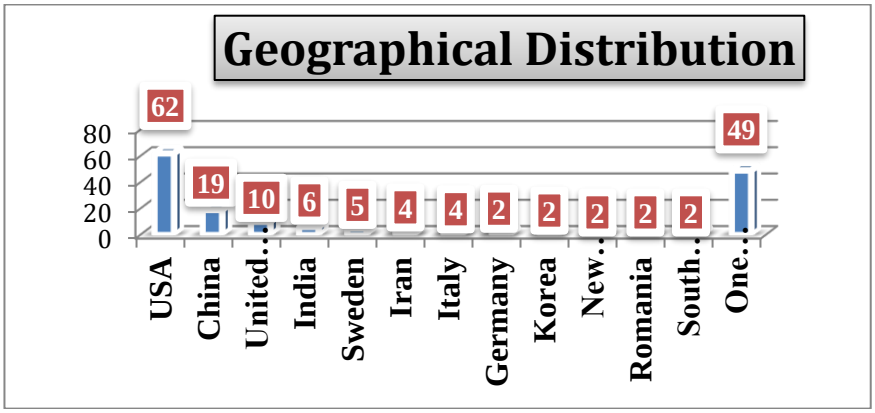


Figure No. 04. Country wise distribution of the article

It can be observed from Table No 06 that, there were as many as 13 countries carrying out research and produced 169 articles. It can be observed from this Table the country wise distribution of contributors, the table reveals that out of the total 169 contributors has contributed during 2009-2018, majority of article 62(36.39 %) have been contributed form USA country. 19 (11.24%) contributors have been contributed form China, 10(5.92%) contributors have been contributed from United Kingdom, 4(2.4%) 49 country contributed with one publication.**In which hypothesis no.01 is valid. "Majority of the contributions are contributed by USA" Table no, 06.**

Relative Growth Rate [r (a)] And Doubling Time [dt (a)] For Publications:

- ***RELATIVE GROWTH RATE (RGR):***

The Relative Growth Rate (RGR) is the increase in number of articles/ pages per unit of time. This definition is derived from the definition of relative growth rates in the study of growth analysis of individual plants and effectively applied in the field of Botany Hunt (1919), Blackman (1919) defined, which in turn had its origin from the study of the rate of interest in the financial investment. The mean Relative Growth rate (R) over the specific period of interval can be calculated from the following equation.

R 1-2 = Loge 2 W - loge IW

Whereas, 1-2 R = mean relative growth rate over the specific period of interval.

Loge IW = log of initial number of Articles.

Loge 2 W = log of final number of articles after a specific period of interval.

2 T - 1 T = the unit difference between the initial time and final time. The year can be taken here as the unit of time. The RGR for articles is hereby circulated.

Therefore,

1-2 (aa-1 year-1) can represent the mean relative growth rate per unit of year over a specific period of interval.

- ***DOUBLING TIME (Dt)***

There exists a direct equivalence between the relative growth rate and the doubling time. If the numbers of articles/pages of subject double during a given period then the difference the logarithms of numbers at the beginning and end of this period must be logarithms of number.

If natural logarithm is used this difference has a value of 0.693. Thus the corresponding doubling time for each specific period of interval and for both articles and pages can be calculated by the formula,

Doubling time (Dt) = 0.693/ R (A)

Therefore,

Doubling time for articles D(t) = 0.693/1-2 R (aa-1 year-1)

Table No. 07: Relative Growth Rate and Doubling Time of Publication.

Table No: 07 Relative growth rate & Doubling time for 2009-2013:

Year	No of Articles	Cumulative Frequency	W1	W2	RGR	Mean[R(A)]	DT(A)	Mean DT(A)
2009	9	9		2.19				
2010	24	33	2.19	3.49	1.3		0.53	
2011	18	51	3.49	3.93	0.44	**0.444**	1.58	**1.008**
2012	15	66	3.93	4.18	0.25		2.77	
2013	17	83	4.18	4.41	0.23		0.16	

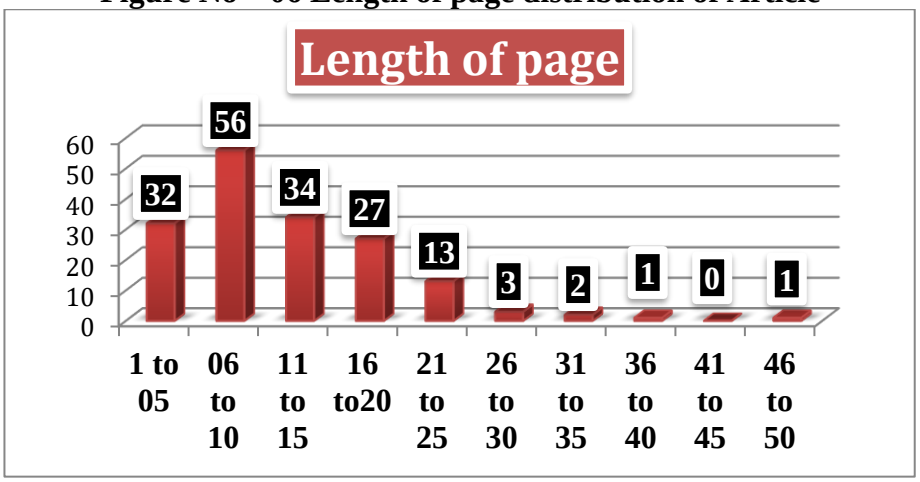
Relative growth rate & Doubling time for 2014-2018:

Year	No of Articles	Cumulative Frequency	W1	W2	RGR	Mean[R(A)]	DT(A)	Mean DT(A)
2014	20	20		2.99				
2015	9	29	2.99	3.36	0.37		1.87	
2016	21	50	3.36	3.91	0.55	**0.292**	1.26	**1.67**
2017	14	64	3.91	4.15	0.24		2.89	
2018	22	86	4.15	4.45	0.3		2.31	

From the table no.07 it noticed that the mean relative growth for the first five years 2009 to 2013 is (0.444). While the Doubling time [DT (A)] gradually increased from (1.008).Then another five year i.e. from 2014 to 2018 noticed that the mean relative growth 0.292 While the Doubling time [DT (A)] gradually increased from (1.67).Thus as the rate of growth of publication was decreased, the corresponding Doubling Time was increased.

- ***Length of Pages distribution of article***

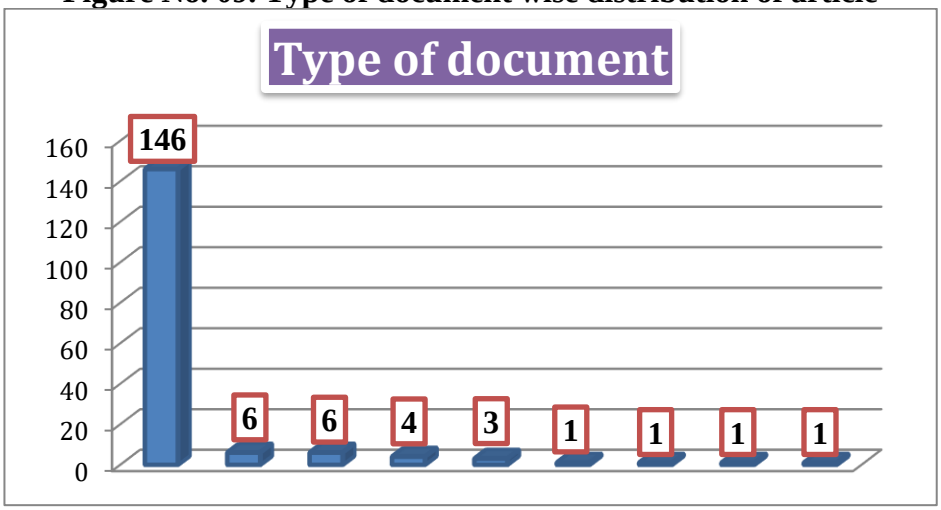
Figure No – 06 Length of page distribution of Article



It can be observed from the table no 08and figure no 06 the majority articles length of pages 56 articles publication from 6 to 10 pages. Then 34 articles were published from 11 to 15.Then 27 articles published from 16 to 20 and remaining further continue according presented in a table

- ***Type of document wise distribution of article***

Figure No. 09. Type of document wise distribution of article



It can be observed from Figure no. 07the highest 146 (86.39%) number of publication has been published in research article and so on presented in this table.

- ***Institution wise distribution of Article***

The distribution of article with sponsoring parental institution where from the collaborators contributed articles was analyzed and interpreted in the figure no. 08

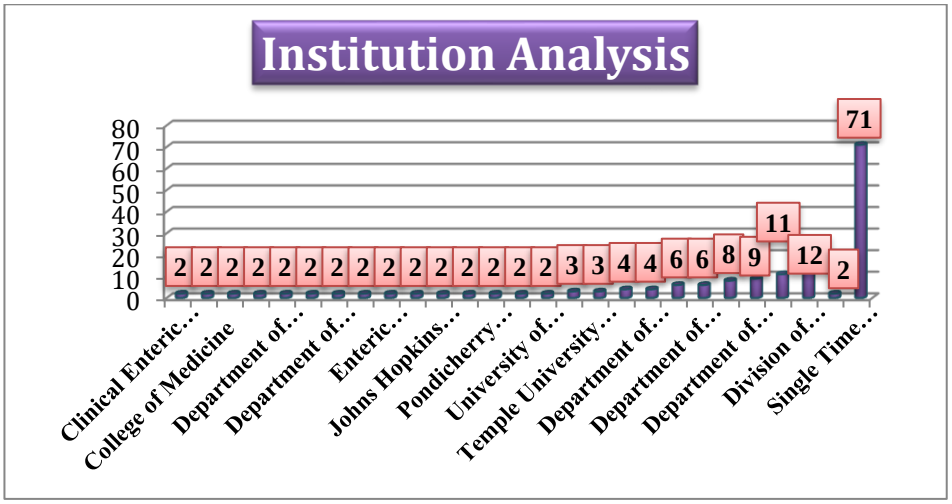


Figure No.08 ***Institution wise distribution of Article***

The distribution of published articles by institution wise the figure09 reveals that, out of 169 contributors, the highest number 12 (7.10%) of contributors are contributed form the Division of Gastroenterology & Hepatology Then 11 i.e. from Department of Medicinewith (6.51%) & remaining continued like presented in graph.

- ***No. of References wise distribution of article***

Table no.10 No. of References wise distribution of article

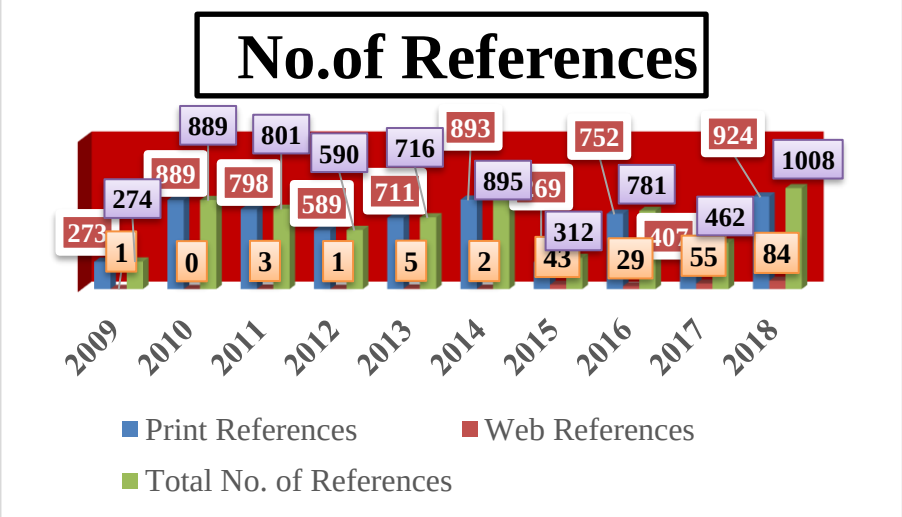


Figure No.09. - No. of References wise distribution of article

It can be observed from the table no 09and figure also maximum articles are print references the majority print references in the year of 2018 were 924 From total 1008 References, and majority web references in the year of 2018 is 84 web references are given there. **In which hypothesis no.02 is valid. "Majority of the contributions are print references" Figure no, 09.**

10. FINDINGS:

The findings are based on the analysis of collected data appended in 169 articles.

1. The highest number of 49 (28.99%) journals was of NIH public access journal.

2. The highest numbers 24 (14.20 %) of article were published in 2010 contributing.
3. The highest numbers of articles has been published by three authors 20 (11.83%)
4. Most productive authors are Henry P. Parkmanwho had contributed 08(4.73 %) articles.
5. Final total Collaborative Index is 6.16.
6. USA is the top producing country with 69 (36.69%) publications of the total output.
7. Majority articles length of pages 56 articles publication from 6 to 10 pages.
8. The 169 (100.00%) articles were published in English Language.
9. The highest 146 (86.39%) number of publication has been published in research article.
10. The highest number 12 (7.10%) of contributors are contributed form the Department of Internal Medicine.
11. There were as many as 34 (20.12%) authors used the mayo.
12. There were as many as 85 (50.30%) authors used the edu.
13. Majority of the contributions are print references available in the year 2018 i.e. 924(14.98%) out of 1008 articles.

CONCLUSION:

Scientometrics relatively new subject of Diabetic Gastroparesis. It helps to evaluate information & to handle the information in libraries and information centers by the quantitative analyzed information. It deals with the mathematical and statistical analysis. We concluded that the present study is based on Diabetic Gastroparesis articles in pub med database. This study is helpful for researches as well as information scientists. It is good and informative for the medical field researchers. We concluded that the present study is based on Diabetic Gastroparesis articles during the period of last ten years journals. This study reveals that the categories of article distribution are remarkable in these recent years. All the articles were published in English language.

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