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Mapping the Study and Awareness on Early Death Research: A scientometric Analysis

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Abstract

To measure the research impact on “Early Death”, literatures indexed in SCOPUS has been downloaded from 1999 to 2018 towards the implemented of a few scientometric techniques. Brief information about the pain of the “Early Death” has been given in the introduction along with the information related to the work done in this research. A few literatures related to the scientometric study have been reviewed. The data utilized for the research work was only for 20 years and from the SCOPUS database, alone. The methodology adopted for the research work was descriptive research. Relevant hypotheses are framed to test the variables. Regression test proved that the literatures published between 2009 and 2013 are fit to calculate the doubling time of the records. Among the type of literatures, “Articles” dominated the other type of literatures involved in the publications. It was identified that the collaborative publications played dominant role over the single authorship. The degree of collaboration was 0.90. Top three positions towards the maximum productivity have been occupied by the USA authors. The fitness test of Lotka’s Law of Bibliometrics was conducted through Kolmogorov Smirnov Test. The author productivity of this research work does not fit Lotka’s Law of author productivity. The article is concluded with a request to the MHRD of the global countries to encourage the scientists to do many more research on “Early Death” to give more awareness to the society to make the human beings to live and lead a happy long life.

Keywords: Regression Test-- Authorship Pattern – Lotka’s Law – Kolmogorov Smirnov Test - Doubling Time- Scientometric Analysis

1. Introduction

“Death” is certain to all the people who ever born in this world, but “Early Death” are unbearable to every men who are closely associated with the deceased persons. “Early Death” is miserable, which terribly affects the new born to aged people because each and every individual is bounded with certain responsibilities in their own family and as well as in the society. Death cannot be prevented, but “Early Death” can be prevented because there are plenty of reasons behind the early death such asin-different food habitation, indiscipline physical life style, stress, polluted environment, impact of technology, drugs and alcoholic addiction, accidents, anti-social elements. Every researchers in the society should have social responsibility to promote awareness

to prevent the human society from “Early Death”. Therefore, to assess the current research status on the literature output on “Early Death”, this scientometric study has been conducted. Literatures related to scientometric analysis are reviewed. The data collection was limited to twenty years from 1999 to 2018 from the SCOPUS database. A total of 5782 literatures are published during the above said research period. Regression test has been conducted to assess the deviation of the research output and also to know the possibility of the doubling time of publications published on “Early Death”. The type of literatures involved in the publications and authorship pattern of the records published are ascertained. Degree of collaboration of the author productivity was identified. Top ten authors are retrieved and described with the number of citations received, along with their respective h-index. The Bibliometric Law propounded by Alfred Lotka has been tested with the Kolmogorov Smirnov Test on the author productivity of the research output on “Early Death”. The article was concluded with the findings and a suggestion to the Ministry of Global Human Resource Development to motivate the global scientists to make many more contributions through research literatures to give more and more awareness to prevent the “Early Death”.

2. Review of Literature

Liu, Z., Lu, Y., & Peh, L. C. (2019). The Scientometric techniques were adopted on the global research output on “Building Information Modelling from the year 2004 to 2019. The data has been downloaded from the core collections of Web of Science for the research study. A total of 1455 literatures were downloaded. The introductory part of the article highlighted as few information about the “Building Information Modelling”. The literature survey reveals about the previous study of “Building Information Modelling”. CiteSpace tool-kit has been utilized for the analysis and visualization. A pictorial representation for the year wise productivity has been given in the article. It was very clear that the year 2018 was most productivity. The top ten authors were identified and tabulated in table number two. It was Xiangyu Wang of Curtin University, Australia leads the table with a maximum record count of 41(2.82%). An overall of 75 countries were involved towards publishing 1455 research articles. The top ten countries were identified and tabulated in table number three. It was found that USA produced more number of publications with 341(23.44) and placed first. Top ten institutions on the basis of the productivity has been identified and tabulated in table number four. “Curtin University” of Australia placed first with a record count of 69 records. Top ten subjects were tabulated and the subject “Engineering Civil” was placed in the first place with a record count of 813. Top ten journals were identified and the journal entitled “Automation in Construction” published from Netherlands was the most productive with 294 publications. Co-authorship, collaboration of the countries, institution wise collaboration, and co-occurrence of words were visualized with a web view. Top ten key words were identified and tabulated. Co-citations clusters of Building Information Modelling research were also tabulated. The whole research publications have been categorized into three stage viz., (i) Formulating Stage, (ii) Accelerating Stage and (iii) Transforming Stage.¹ **Sivasekaran K. (2015).** The scientometric study describes the literature growth and development of renewable energy research productivity in India on the

basis of the research publications indexed in Web of Science Database from 2001-2013. 652 Publications were published by the Indians. Among those publications, 432 numbers were article, 186 numbers were review, 25 numbers were preceding paper, and six numbers were letters. The Indian Institute of Technology, Chennai leads the table with the contribution of 17.79 percent. The Indian researchers published papers in the journals which have impact factors between 0.358 and 6.626. It was suggested that the concern organizations and sponsoring agencies to encourage the research on renewable energy.² **Sivasamy, K., & Vivekanandhan, S. (2015).** To measure the impact of the research on the literature output on “Environmental Education” from 2009 to 2013, data has been downloaded from SCOPUS database. It was assessed that 2062 number of publications were published during the above said year. The year 2010 was most prolific by publishing more number of papers with a count of 445(22.58%), for which those papers received a citation score of 2067. 0.68 was the average degree of collaboration between the collaborative authors. USA ranked in the first place with 515 publications. ³**Thirumagal. A. (2012)** the contribution of the Indian researchers on Nanotechnology has been analyzed through the techniques of Bibliometrics. A total of 332 numbers of publications were published by the Indians. 4594 Global Citation Score were gained for the above stated number of publications. Sastry M published 12 numbers of publications and placed first in the table. The degree of the collaboration was 0.11 between the collaborative publications. The majority of the publications were articles published in journals with a percentage count of 66.7 percent and stood first in the table in the midst of the other types of publications. The journal entitled “Digest Journal of Nano-materials and Biostructures” produced more number of journal articles with a percentage count of 5.1 percent. It was identified that the impact of “Nanotechnology” will play vital role in mere future.⁴**Mohammad-Hosseini Biglu, Fatemeh Eskandariz and Ali Asgharzadeh (2011).** Data on “Nanotechnology” has been downloaded from MEDLINE database from 2001 to 2010 towards the assessment of the impact of research. A total of 11991 research publications were retrieved from 290 journals. Bradford’s law has been applied to retrieve the core journals. The ratio of the Journals through the application of Bradford’s Law for the three zones of 1, 2 and 3 were 4:21:873, respectively. It was identified that USA played a dominant role for maximum productivity with a percentage count of 39 percent of publications. Among the type of languages, English language played a superior role. The types of publications were dominated by the articles published in journals with a percentage count of 41 percent. Simultaneously, apart from the growth of publications, the application of patent in the field of Micro-structural and nano-technology in World Intellectual Property Organization from the year 2006 to 2010 were also been assessed and stated in the article with a pictorial representation.⁵

3. Research Design

3.1 Objectives of the Study

The research has been conducted to describe the current trend of the research publications on “Early Death” in an intention to know the social responsibility of the global scientists to prevent

the early death occurs among the human beings. To assess the doubling time of the publications. To test the theory of Lotka's law of bibliometrics. To find out the top ten authors who have been involved in publishing research publications on "Early Death" with their citation score and h-Index.

3.2. Limitation of the Study

The data collected for the scientometric analysis is limited to the database "SCOPUS". The study period is limited to twenty years from 1999 to 2018. The bibliometric law is limited to Lotka's Law.

3.3. Research Methodology

The research is descriptive in nature. Data related to the literatures published on "Early Death" indexed in SCOPUS are downloaded from 1999 to 2018 and further described as tables with the application of scientometric techniques. Four hypotheses are framed. Statistical test such as Regression and Kolmogorov Smirnov are applied to test the hypotheses towards interpretation and to reveal the findings.

3.4. Hypotheses

A few hypotheses are framed to test the data with appropriate statistical tool and they are as follows:

1. "H₀: There is a significant relationship between the number of publications published from 1999 to 2018".
2. "H₀: There is a significant relationship between the number of publications published from the first block years of 1999 to 2003 and from 2004 to 2008".
3. "H₀: There is a significant relationship between the number of publications published from the second block years of 2009 to 2012 and from 2013 to 2018".
4. "H₀: There is no significant difference between the prediction of Alfred Lotka and the actual author productivity"

4. Analysis and Interpretation

4.1. Year wise Publications output on Early Death

The year wise research publications on "Early Death" from 1999 to 2018 has been tabulated in table number 4.1., which shows that a total number of 5782 publications are published. The table was crystal clear to describe the year wise research publications. Further, the table reveals

that there are chances of deviations in the growth of publications from 1999 to 2008 (i.e., the first half of the number of years and second half of the number of years). But, it cannot be predicted by visualizing the numerical data of the table, but only the deviations of the productivity could be assessed through appropriate statistical test. Except three years of publications i.e., 2000, 2002 and 2005, the percentage analysis of theyear wise growth of publications for the remaining seventeen years from 1999 to 2018 are in inclining trend.

Sl. No.	Year	No. of Publications	Percentage Analysis
1	1999	195	3.37%
2	2000	251	4.34%
3	2001	207	3.58%
4	2002	225	3.89%
5	2003	210	3.63%
7	2005	263	4.55%
8	2006	231	4.00%
9	2007	252	4.36%
10	2008	273	4.72%
11	2009	278	4.81%
12	2010	297	5.14%
13	2011	329	5.69%
14	2012	355	6.14%
15	2013	365	6.31%
16	2014	360	6.23%
17	2015	359	6.21%
18	2016	361	6.24%
19	2017	379	6.55%
20	2018	381	6.59%
Total		5782	100.00%

Table 4.1. Year wise Growth of the Number of Publications

4.2. Regression Test

Regression Statistics Summary for the overall Research Output from 1999 to 2018	
Multiple R	0.45
R Square	0.20
Adjusted R Square	0.10
Standard Error	25.18
Observations	10
<i>P-value</i>	
Intercept	0.23

X Variable 1	0.19
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Table No.4.2.1 Regression Test

The regression test has been conducted to assess the relationship between the averages of the number of research publications indexed in SCOPUS from 1999 to 2018. The results for the test conducted have been tabulated in table number 4.2.1. The test reveals that the P-value of X Variable 1 is 0.19 is higher than the critical value of 0.05 and the H₀ is rejected “H₀: There is a significant relationship between the number of publications published from 1999 to 2008 and from 2009 to 2018”. Therefore, the alternate hypothesis of “H₁: There is no significant relationship between the number of publications published from 1999 to 2018” is accepted.

Regression Statistics Summary for the Split Years Research Output			
From 1999 to 2003 and From 2004 to 2008		From 2009 to 2013 and From 2014 to 2018	
Multiple R	0.63	Multiple R	0.89
R Square	0.40	R Square	0.79
Adjusted R Square	0.20	Adjusted R Square	0.72
Standard Error	19.29	Standard Error	19.70
Observations	5	Observations	5
<i>P-value</i>		<i>P-value</i>	
Intercept	0.44	Intercept	0.10
X Variable 1	0.25	X Variable 1	0.04

Table 4.2.2. Regression Tests for the two block years

Since, there is no significant relationship between the numbers of publications published from 1999 to 2008 and from 2009 to 2018. It was decided to conduct the regression test for the two block years i.e., first block year was selected from 1999 to 2003 and 2004 to 2008; second block year was selected from 2009 to 2013 and from 2014 to 2018. The table number 4.2.2 shows the results of the two different Regression Tests conducted for the above mentioned two block years. First regression test was conducted for the number of research published for the first block years, which starts from 1999 to 2003 and from 2004 to 2008. The deviation between the averages of the first block year is 0.25, which is higher than the critical value of 0.05. Therefore, the null hypothesis which has been framed as “H₀: There is a significant relationship

between the number of publications published from the first block year of 1999 to 2003 and 2004 to 2008” is rejected and the alternate hypothesis of “H1: There is no significant relationship between the number of publications published from the first block years 1999 to 2003 and 2004 to 2008”, is accepted. Second regression test was conducted to assess the number of research publications published for the second block year, which starts from 2009 to 2013 and from 2014 to 2018. The deviation between the averages of the second block year is 0.04, which is lesser than the critical value of 0.05. Therefore, the null hypothesis which has been framed as “H0: There is a significant relationship between the number of publications published from the second block years 2008 to 2012 and 2013 to 2018” has been accepted. As the deviation is lesser than the critical value of 0.05 for the publications published from 2008 to 2018, the doubling time of the records can be assessed.

4.3. Type of Publications on Early Death

The table number 4.3 highlights the types of research publications involved towards contributing the total number of publications of 5782. “Articles” played a dominant role with a publication count of 4685 (81.03%) publications. The second place has been dominated by the “Reviews” with a publication count of 594 (10.27%) reviews. The third place has been occupied by the “Conference Papers” with a count of 228 (3.94%) papers. “Book Chapters” placed in the fourth place with 146 (2.53%) record count, followed by “Letters” with 30 (0.52%), “Books” with 27 (0.47%); Short Survey with 27 (0.47%); “Notes” with 21 (0.36%); “Editorials” with 15 (0.26%); “Erratum” with 03 (0.05%) and finally 6 (0.10%) publications are not properly defined by the SCOPUS Database.

S. No.	Type of Publications	No. of Publications	Percentage Analysis
1	Articles	4685	81.03
2	Reviews	594	10.27
3	Conference Papers	228	3.94
4	Book Chapters	146	2.53
5	Letters	30	0.52
6	Books	27	0.47
7	Short Surveys	27	0.47
8	Notes	21	0.36
9	Editorials	15	0.26
10	Erratums	3	0.05
11	Undefined	6	0.10
Total		5782	100.00

Table 4.3. Type of Publications

4.4.Degree of Collaboration of Authorship Pattern on Early Death

The table number .4.4 reveals the authorship pattern of the literature output from 1999 to 2018 for the publications of research papers on “Early Death”. Further, to ascertain the Degree of Collaboration, the formula proposed by Subramanyam (1983) has been utilized. The formula is as follows:

The degree of collaboration $C = (Nm + Ns) / Ns$
 Where, C = Degree of collaboration in a discipline
 Nm = number of multi authored papers in the discipline
 Ns = number of single papers in the discipline

5194 authors were collaborated towards the publications of 5782 research publications. 588 numbers of publications are published by single authors. The average degree of collaboration of the collaborative authorship is 0.90, which is an indication of high collaboration between the collaborative authors towards publishing research publications on “Early Death”.

S. No.	Year	No. of Single Author Publications	No. of Multi Authored Publications	Total No. Of Publications	Degree of Collaboration
1	1999	17	178	195	0.91
2	2000	24	227	251	0.90
3	2001	24	183	207	0.88
4	2002	21	204	225	0.91
5	2003	22	188	210	0.90
6	2004	23	188	211	0.89
7	2005	30	233	263	0.89
8	2006	24	207	231	0.90
9	2007	19	233	252	0.92
10	2008	42	231	273	0.85
11	2009	34	244	278	0.88
12	2010	37	260	297	0.88
13	2011	41	288	329	0.88
14	2012	44	311	355	0.88
15	2013	34	331	365	0.91
16	2014	36	324	360	0.90

17	2015	39	320	359	0.89
18	2016	21	340	361	0.94
19	2017	23	356	379	0.94
20	2018	33	348	381	0.91
Total		588	5194	5782	9.83
Average Degree of Collaboration					0.90

Table 4.4. Authorship Pattern

4.5. Highly Prolific Authors with h-Index on Early Death (Top Ten Authors)

The table number 4.5 describes the publications of top ten authors published on “Early Death” from 1999 to 2018. “Dearani, Mayo Clinic, USA” is the topper of the table with a credit of publishing 47 publications, a citation score of 17960, h-Index of 66 (excluding the self-citations) and 67 (including self-citations). “Schaff, H.V., Mayo Clinic, USA” is the second topper of the table of top ten authors with a credit of publishing 44 publications, a citation score of 49184, h-Index of 111 (excluding the self-citations) and 114 (including self-citations). “Burkhart, H.M., University of Oklahoma Health Science Center, USA is placed in the third place with 21 publications, a citation score of 3864, h-Index of 34 (excluding the self-citations) and 35 (including self-citations). Choudhary, S.K., All India Institute of Medical Sciences of India is also placed in the third place with 21 publications, a citation of 1422, h-Index of 17 (excluding the self-citations) and 18 (including the self-citations). Nordestgaard, B.G., Kobenhavns Universitet, Denmark is placed in the fourth place with a publication count of 20, a citation count of 58422, h-Index of 110 (excluding self-citations) and 114 (including self-citations). Airan, B., All India Institute of Medical Sciences, India is placed in the fifth place with a publication count of 19, a citation count of 2602, h-Index of 24 (including & excluding self-citations). Tallman, M.S., Stanford University, USA is placed in the sixth place with a publication count of 18, a citation score of 37052, h-Index of 93 (excluding self-citations) and 95 (including self-citations). Saxena, A., All India Institute of Medical Sciences, India is placed in the seventh place with a publication count of 17, a citation score of 3651, h-Index of 29 for both excluding and including self-citations. Talwar, S., All India Institute of Medical Sciences, India is placed in the eighth place with a publication count of 16, a citation score of 1456, h-Index of 16 (excluding self-citations) and 18 (including self-citations). The ninth place has been shared by three authors viz., Kothari, S.S., All India Institute of Medical Sciences, India; Mayer, J.E., Children’s Hospital, Boston, USA; Suri, R.M., Cleveland Clinic Lerner College of Medicine of Case Western Reserve University with a publication count of 15, citation score of 2615, 25864 and 7883, respectively. Kothari, S.S. gained an h-Index of 25 (excluding self-citations) and 26 (including self-citations). Mayer, J.E. gained an h-Index of 85 (excluding self-citations) and 87

(including self-citations). Suri, R.M. gained an h-Index of 43 (excluding self-citations) and 44 (including self-citations). Six authors are placed in the tenth place for publishing 13 publications. Among the six authors, Chung, C.H., Ulsan University, South Korea gained a citation score of 3209, h-Index of 24 (excluding self-citations) and 26 (including self-citations); Hiddemann, W., Klinikum der Universitaet, Germany gained a citation score of 40259, h-Index of 95 (excluding self-citations) and 97 (including self-citations); Jin, J., Zhejiang University School of Medicine, China gained a citation score of 4007, h-Index of 28 (excluding self-citations) and 29 (including self-citations). Juneja, R., All India Institute of Medical Sciences, India, gained a citation score 1361, h-Index of 19 for both excluding and including self-citations. Jung, S.H., University of Ulsan, South Korea gained a citation score of 1471, h-Index of 19 (excluding self-citations) and 20 (including self-citations). Stulak, J.M., Mayo Clinic, USA gained a citation score of 3452 and 30 as h-Index excluding and including self-citations.

Rank	Authors	Affiliated Institution	Country	No. of Publications	No. of Citations	h-Index	
						Excluding Self Citation	Including Self Citation
1	Dearani, J.A.	Mayo Clinic	USA	47	17960	66	67
2	Schaff, H.V.	Mayo Clinic	USA	44	49184	111	114
3	Burkhart, H.M.	University of Oklahoma Health Science Center	USA	21	3864	34	35
3	Choudhary, S.K.	All India Institute of Medical Sciences	India	21	1422	17	18
4	Nordestgaard, B.G.	KobenhavnsUniversitet	Denmark	20	58422	110	114
5	Airan, B.	All India Institute of Medical Sciences	India	19	2602	24	24
6	Tallman, M.S.	Stanford University	USA	18	37052	93	95
7	Saxena, A.	All India Institute of Medical Sciences	India	17	3651	29	29

8	Talwar, S.	All India Institute of Medical Sciences	India	16	1456	16	18
9	Kothari, S.S.	All India Institute of Medical Sciences	India	15	2615	25	26
9	Mayer, J.E.	Children's Hospital Boston	USA	15	25864	85	87
9	Suri, R.M.	Cleveland Clinic Lerner College of Medicine of Case Western Reserve University	USA	15	7883	43	44
10	Chung, C.H.	Ulsan University	South Korea	13	3209	24	26
10	Hiddemann, W.	Klinikum der Universitaet	Germany	13	40259	95	97
10	Jin, J.	Zhejiang University School of Medicine	China	13	4007	28	29
10	Juneja, R.	All India Institute of Medical Sciences	India	13	1361	19	19
10	Jung, S.H.	University of Ulsan	South Korea	13	1471	19	20
10	Stulak, J.M.	Mayo Clinic	USA	13	3452	30	30

Table 4.5. Top Ten Authors with citation scores and h-Indices

4.6. Application and Testing of Lotka's Law of Author Productivity

The numbers of authors who are involved in publishing single publication are identified to ascertain the results during the process of testing the principle of Lotka's Law of author productivity. It is the assumption of Lotka that the total number of publications is based on the inverse square of the number of author's published single publication. Therefore, to test the Lotka's Law, Kolmogorov Smirnov Test has been utilized to test the following hypothesis:

“H0: There is no significant difference between the prediction of Alfred Lotka and the actual author productivity”

x	y	Observed	Cumulative	Cumulative	1/xn	fe	cum	Dif
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		D	O	of y			fe	
1	588	0.1021	0.1021	588	1.00	0.077	0.077	0.0251
2	486	0.0844	0.1864	1074	0.75	0.058	0.135	0.0515
3	571	0.0991	0.2855	1645	0.64	0.049	0.184	0.1016
4	559	0.0970	0.3826	2204	0.57	0.044	0.228	0.1550
5	551	0.0956	0.4782	2755	0.52	0.040	0.267	0.2108
6	670	0.1163	0.5945	3425	0.48	0.037	0.304	0.2902
7	552	0.0958	0.6903	3977	0.45	0.035	0.339	0.3514
8	466	0.0809	0.7712	4443	0.43	0.033	0.372	0.3994
9	301	0.0522	0.8235	4744	0.41	0.031	0.403	0.4204
10	256	0.0444	0.8679	5000	0.39	0.030	0.433	0.4349
11	164	0.0285	0.8964	5164	0.37	0.029	0.462	0.4346
12	115	0.0200	0.9163	5279	0.36	0.028	0.490	0.4267
13	92	0.0160	0.9323	5371	0.35	0.027	0.517	0.4158
14	77	0.0134	0.9457	5448	0.34	0.026	0.543	0.4031
15	53	0.0092	0.9549	5501	0.33	0.025	0.568	0.3869
16	48	0.0083	0.9632	5549	0.32	0.025	0.593	0.3705
17	40	0.0069	0.9701	5589	0.31	0.024	0.617	0.3534
18	19	0.0033	0.9734	5608	0.31	0.024	0.640	0.3332
19	21	0.0036	0.9771	5629	0.30	0.023	0.663	0.3138
20	23	0.0040	0.9811	5652	0.29	0.023	0.686	0.2952
21	13	0.0023	0.9833	5665	0.29	0.022	0.708	0.2754
22	15	0.0026	0.9859	5680	0.28	0.022	0.730	0.2563
23	9	0.0016	0.9875	5689	0.28	0.021	0.751	0.2366
24	12	0.0021	0.9896	5701	0.27	0.021	0.772	0.2178
25	9	0.0016	0.9911	5710	0.27	0.021	0.792	0.1988
26	8	0.0014	0.9925	5718	0.26	0.020	0.813	0.1799
27	9	0.0016	0.9941	5727	0.26	0.020	0.833	0.1615
28	9	0.0016	0.9957	5736	0.26	0.020	0.852	0.1435
29	2	0.0003	0.9960	5738	0.25	0.019	0.872	0.1244
30	8	0.0014	0.9974	5746	0.25	0.019	0.891	0.1067
31	1	0.0002	0.9976	5747	0.24	0.019	0.909	0.0881
32	5	0.0009	0.9984	5752	0.24	0.019	0.928	0.0704
33	2	0.0003	0.9988	5754	0.24	0.018	0.946	0.0524
34	2	0.0003	0.9991	5756	0.24	0.018	0.965	0.0346
35	2	0.0003	0.9995	5758	0.23	0.018	0.982	0.0170
36	3	0.0005	1.0000	5761	0.23	0.018	1.000	- 0.0002
Total	5761	1.0000		c value=	12.99	1.000		

Table 4.6. Testing of Lotka's Law with KS Test

The table number 4.6. has very clear to reveal the test of Lotka’s Law. “x” value denoted the number of authors. The selection of the number of authors has been down according to the straight count (i.e., with a limitation of the continuous series of the number of authors without break involved in publications - up to 36 numbers). “y” value denotes the number of articles published. The observed value and the expected value have been calculated. The Lotka’s Power Law has been utilized to find out the expected value. The d max value i.e., maximum deviation between the Observed value and the Expected value is 0.4349. The Threshold value or Critical Value is 0.0215. Since, the Expected value of 0.4349 is higher than the critical value, the null hypothesis of “H0: There is no significant difference between the prediction of Alfred Lotka and the actual author productivity” is rejected and the alternate hypothesis of “H1: There is a significant difference between the prediction of Alfred Lotka and the actual author productivity”, has to be accepted.

4.7. Doubling Time of Publications on Early Death

Year	No. of Records	Cumulative Records	W1	W2	R= W2-W1	Mean of R	Doubling Time	Mean of Doubling Time	No. of Months	No. of Days	Doubling Time
2009	278	278	5.63	5.63	0.00	1.11		0.69	8.28	8	8 Months and 8 Days
2010	297	575	5.69	6.35	0.66		1.05				
2011	329	904	5.80	6.81	1.01		0.69				
2012	355	1259	5.87	7.14	1.27		0.55				
2013	365	1624	5.90	7.39	1.49		0.46				
2014	360	1984	5.89	7.59	1.71	1.98	0.41	0.35	4.20	6	4 Months and 6 Days
2015	359	2343	5.88	7.76	1.88		0.37				
2016	361	2704	5.89	7.90	2.01		0.34				
2017	379	3083	5.94	8.03	2.10		0.33				
2018	381	3464	5.94	8.15	2.21		0.31				

Table 4.7. Doubling of Publications

Out of the total data of twenty years, it is proved through the Regression Test that the averages of the last ten years have relationship among the year wise number of research publications. Therefore, there are high possibilities towards calculating the doubling time of publications. On the basis of the literatures published from 2009 to 2013, it is identified that the time will be taken for doubling of records will be 8 months and 8 days. On the basis of the literatures published from 2014 to 2018, it was identified that the time will be taken for the doubling of records will be 4 months and 6 days. Being the research publications are seems to be in increasing trend, the consuming doubling time taken for the publications of the second half (i.e. 2014 to 2018) is lesser than the first half.

5. Findings, Suggestion and Conclusion

The scientometric study from 1999 to 2018 denotes that a total number of 5782 publications are published on “Early Death”. The result of the regression test reveals that the deviation of the number of publications published from 1999 to 2008 and 2009 to 2018 are high. The test reveals that the P-value of X Variable 1 is 0.19 is higher than the critical value of 0.05 and the H₀ is rejected “H₀: There is a significant relationship between the number of publications published from 1999 to 2018”. It was identified that there was a significant relationship between the number of publications published from the second block years of 2009 to 2013 and from 2014 to 2018. Therefore, on the basis of the results of the regression test conducted for the second blockyears of 2009 to 2013 and from 2014 to 2018, it was decided to calculate the doubling time of the records. It was identified that 8 months and 8 days will be taken for the doubling of records at par with the publications published from 2009 to 2013. It was also identified that 4 months and 6 days will be taken for the doubling of records at par with the publications published from 2014 to 2018. The Kolmogorov Smirnov Test proved that the Lotka’s Law does not fit to the author productivity of the research publications published from 1999 to 2018 on “Early Death”.The research publications increased from year to year with a moderate speed to give more awareness to prevent the “Early Death”, which proves that the global scientists have more social concern to protect the human lives. Therefore, it is suggested that the global scientists of each and every country should be motivated by their respective Ministry of Human Resource Development to increase the awareness with more number of publications at a greater speed to eradicate“Early Death” from the society, which will definitely make the contemporary society and the next generation to live and lead a happy long life.

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