http://dergipark.gov.tr/ijhmt/ Doi Number: 10.31201/ijhmt.653708

Int Journal Of Health Manag. And Tourism 2019, 4(3), 237-249

IJHMT
International Journal Of Health Management And Tourism

Editorial

GLOBAL BURDEN OF DISEASE: A BIBLIOMETRIC ANALYSIS BASED ON THE SCOPUS DATABASE

Arzu YIGIT*

*PhD.Süleyman Demirel University, Department of Health Management, Isparta, Turkey arzuyigit@sdu.edu.tr
ORCID Number: https://orcid.org/0000-0002-5777-3405

Received: 01.12..2019
Accepted: 26.12.2019

Abstract: The worldwide mortality and morbidity is now a global public health problem. Burden of disease is a joint measure of mortality and morbidity. Burden of disease studies have been implemented in many countries using the disability-adjusted life year (DALY) to assess major health problems. The purpose of this research is to examine academic publications related to burden of disease in terms of bibliometric indicators. Bibliometry is an analysis method used to measure and evaluate publications in a subject area. In this research, it is aimed to determine the scientists who direct the concept of global burden of disease with bibliometric mapping method. Research data was collected through the Scopus database. The data were analyzed by bibliometric analysis technique. In the research, author network analysis was done and visualized using the VOSviewer package program. It has been found that academic studies related to global burden of disease increased rapidly especially after 2000s. The authors who received the most citations by global burden of disease were identified as Murray C.J.L. (n=24.240) and Lopez A.D. (20.476). But it could not reach a comprehensive research in Turkey. Thus it is thought that both the ministry of health and universities should give more importance at global burden of disease in Turkey.

Keywords: Burden of Disease, Disability-Adjusted Life Year (DALY), Bibliometric Analysis

1. Introduction

An effective health policy necessitates a reliable characterization of the burden of disease by cause (Würthwein et al., 2001:501). Everyone in the world deserves to live a long life in full health. To achieve this goal, we need a comprehensive picture of what blocks and kills people of countries, time, age and gender. The global burden of disease provides a tool to measure health loss from hundreds of diseases, injuries and risk factors so that health systems can be improved and inequalities can be eliminated (IHME, 2019).

One of the most important public health issues in the future is to effectively allocate available resources to reduce the global burden of disease burden and reduce health disparities between the poor and wealthy populations. The main risk factors for death and disability in the world are malnutrition; poor water supply, sanitation and personal and household hygiene; unsafe sexual behavior; tobacco use; alcohol use; occupational hazards; hypertension; physical inactivity; illegal drugs; and air pollution. The main purpose of the country's health systems is to increase the life expectancy of the population, to maintain and improve the quality of life (Michaud, Murray, Bloom, 2001: 535). The global burden of disease study predicts early death and disability of all major illnesses and injuries. In addition, it aims to measure the risks that diseases and other factors play in the etiology and injury etiology of the disease (Charlson et al. 2011). Burden of disease is very useful in prioritizing and planning health care in developing countries.

There is a great need for resources to deliver health care, but resources for health spending are scarce. For this reason, it is necessary to choose cost-effective ones from alternative health services. Measures such as Disability Adjusted Life Years (DALY) are used in the measurement of health care output (Yiğit and Yiğit, 2019:224). DALY, is an appropriate summary measure of population health to express the epidemiological burden of diseases and as a tool for health-sector planning (Krishnamoorthy et al., 2009:26; Gold and Muennig, 2002:260). DALY combines the number of people affected by disease or mortality in a population and the duration and severity of their condition into one number (Knol et al. 2009:1). DALYs are the sum of mortality (YLLs) and non-fatal health loss (YLDs) in the population. The YLL is a measure of mortality and YLD is a measure of non-fatal health loss (Hong and Saver, 2010: 471). Another measure used to measure health outcomes is health-adjusted life years (HALY), estimating the burden of disease, and the results of medical care and public health interventions in the cost-effectiveness analysis (Gold and

Muennig, 2002:260). The purpose of this research is to examine academic publications related to burden of disease in terms of bibliometric indicators.

2. Method of the Research

The purpose of this research is to examine academic publications related to burden of disease in terms of bibliometric indicators. The research has a quantitative research design based on bibliometric analysis. Bibliometry is a technique that analyzes the scientific studies related to the field, such as author, subject, cited author, cited sources, keywords, and helps to reveal the general structure and tendency of the obtained data and statistics (Zan, 2012:15). In this research, it is aimed to determine the scientists who direct the concept of global burden of disease with bibliometric mapping method.

2.1. Research Problem

• What is the numerical status of the academic researches related to the global burden of disease, the type of publication, the language of the publication and the types of resources, and the distribution of the journals?

• Who are the authors of academic publications related to the global burden of disease, in which countries and institutions are the authors, and what are the citations of the authors?

• What is the author's publications on the global burden of disease?

2.2. Data Collecting and Data Analysis

The data of this study were obtained by using Elsevier Scopus from international citation indexes. In the research, online scanning was performed in Scopus database on 10.10.2019. In the research, the document title, abstract, and keywords were selected in the database. The documents published between the years 1960-2019 were included in the study. In the Scopus database, using the query "(TITLE (den burden of disease)) OR KEY (DALY OR) OR KEY (Disability-Adjusted Life Year))) AND DOCTYPE (ar) AND PUBYEAR> 1959 AND PUBYEAR <25.11.2019))" access is provided. The data were recorded as MS Excel spreadsheet.

In the study, bibliometry was used as data analysis technique. The total number of publications related to the global burden of disease, the language of the publications, the institutions of the authors, the number of active journals, active countries and citations, the author analysis were

analyzed as bibliometric variables. In the study, the author and co-author network maps were created using the package program to create and display bibliometric maps.

3. Findings

The first study on global burden of disease was reported by Massey et al., (1978) as "Cost of care or burden of disease?" is the research. The global burden of disease has started to increase especially since 2000. Most studies (n = 362) were published in 2019. A significant increase was observed in the number of publications between 2000-2019 (Figure 1).

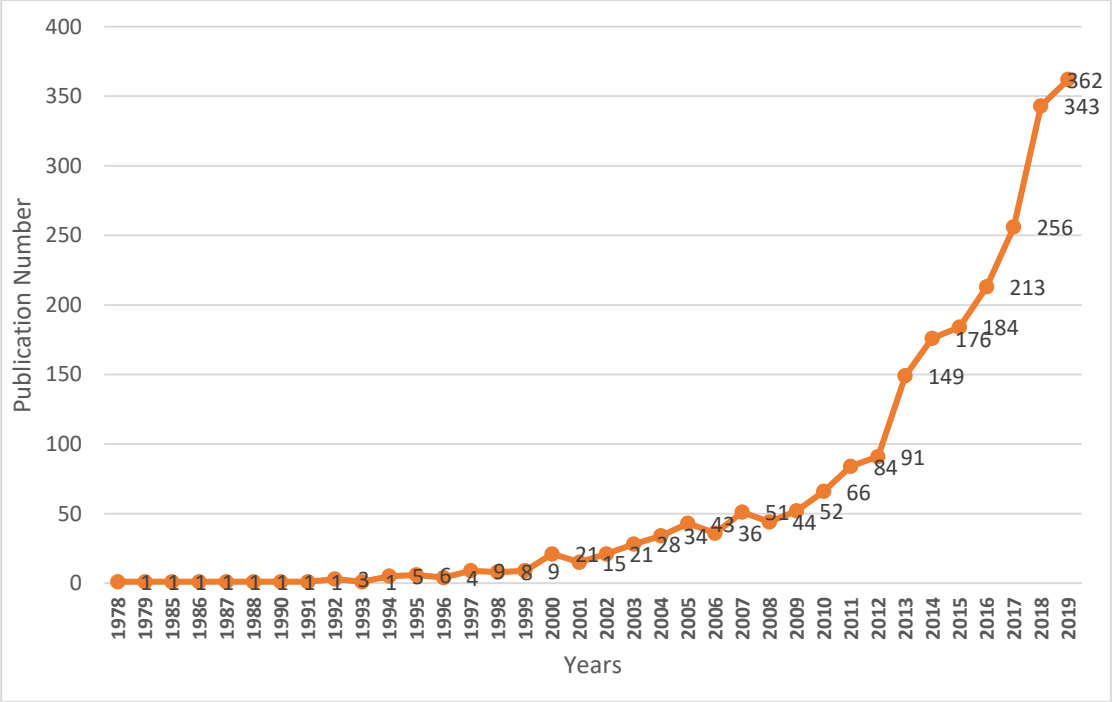

Figure 1. Distribution of Publications by Years

In Figure 2, the publication language of the researches on the burden of global disease is shown. Accordingly, it was found that the most frequent publication was English (n = 2160). No publications in Turkish have been identified

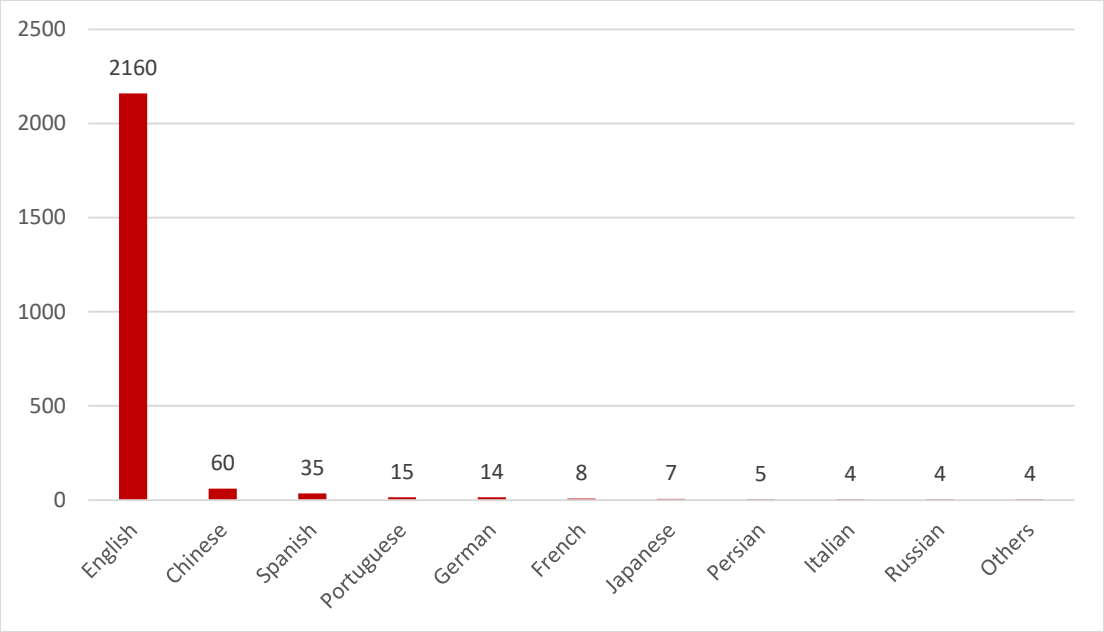

Figure 2. Numerical Distribution of Research by Publication Language

The distribution of authors by institutions is given in Table 1. Accordingly, the majority of authors work at the University of Washington (n=250) and the Institute for Health Metrics and Evaluation (n=218).

Table 1. Distribution of Authors by Institutions

Rank ID	Institution	Number of authors
1	University of Washington, Seattle	250
2	Institute for Health Metrics and Evaluation	218
3	London School of Hygiene & Tropical Medicine	135
4	University of Queensland	134
5	Organisation Mondiale de la Santé	125
6	Tehran University of Medical Sciences	122
7	University of Melbourne	116
8	Imperial College London	104
9	Harvard School of Public Health	102
10	University of Oxford	99

The Institute for Health Metrics and Evaluation (IHME) is an independent population health research center at the University of Washington that provides a rigorous and comparable measurement of the world's most important health problems. IHME aspires to make available to the world high-quality information on population health, its determinants, and the performance of health systems (IHME, 2019).The distribution of academic studies by country is given in

Figure 3. The distribution of publications by country has been examined by considering the 20 countries with the highest number of studies. The United States (n = 884) was the country that conducted the most scientific research on global burden of disease. Turkey (n = 43) was detected is extremely low compared to other countries that do scientific research on this subject

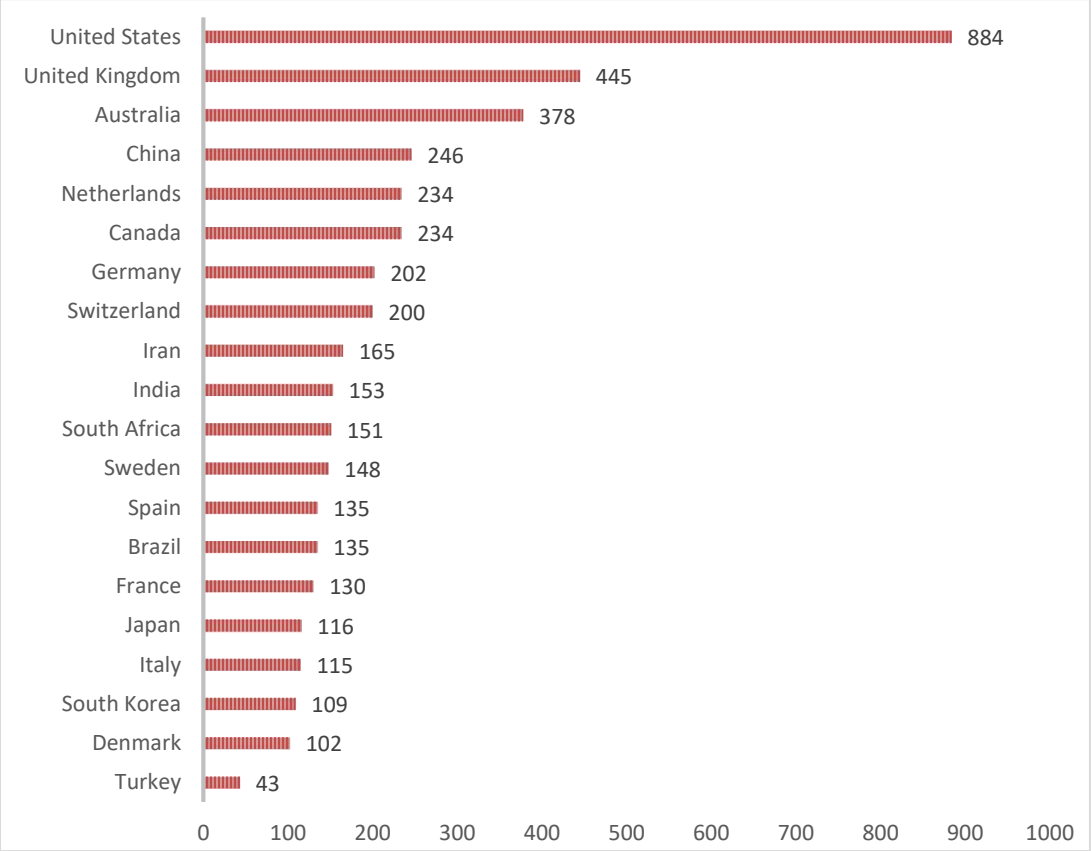

Figure 3. Distribution of Academic Studies by Country

The top ten journals active in the global burden of disease research are given in Table 2. Accordingly, most studies on the global burden of disease have been published in academic journals such as Plos One (n=90), Lancet (n=75) and Vaccine (n=49).

Table 2. Top Ten Journals Active in Research Related to Global Burden of Disease

Rank ID	Journals Name	Number
1	Plos One	90
2	Lancet	75
3	Vaccine	49
4	International Journal of Environmental Research And Public Health	31
5	Lancet Global Health	27
6	Archives of Iranian Medicine	25
7	Plos Neglected Tropical Diseases	25
8	BMC Public Health	23
9	Environmental Science And Technology	21
10	Journal Of Korean Medical Science	21

The authors who have the most citations regarding the global burden of disease study are given in Figure 4. Accordingly, the authors who received the most citations by global burden of disease were identified as Murray (n=24.240) and Lopez (20.476).

The authors who have the most citations regarding the global burden of disease study are given in Figure 4. Accordingly, the authors who received the most citations by global burden of disease were identified as Murray (n=24.240) and Lopez (20.476).

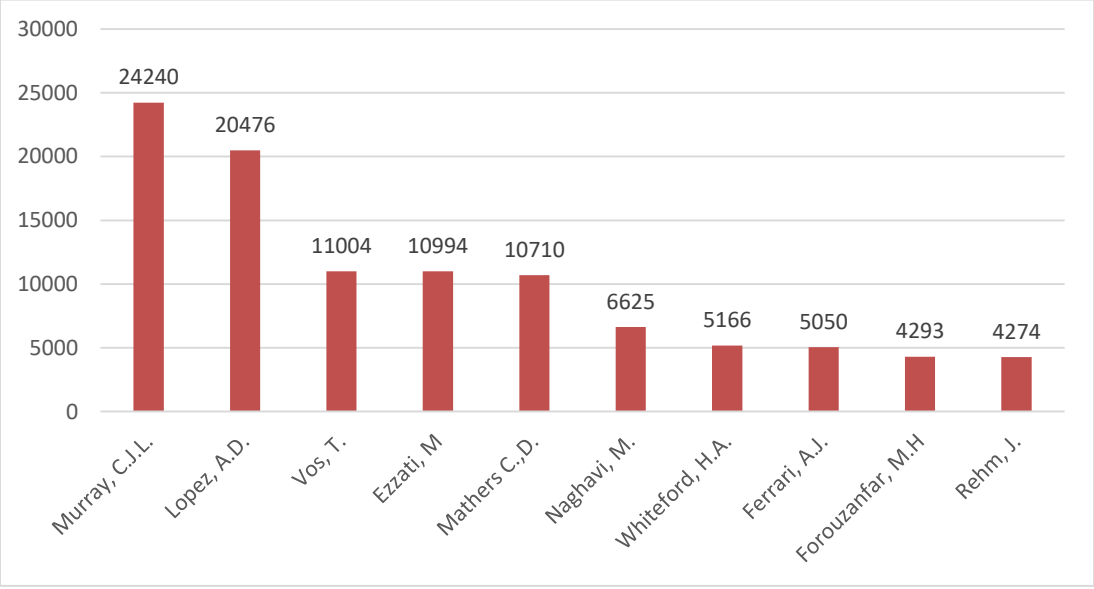

Figure 4: The Authors Who Received Most Citations Global Burden of Disease Study

The author's network map of the global burden of disease is given in Figure 5. According to the

analysis, 9034 authors were identified as authors in the global burden of disease study. Among these authors, the number of authors with a minimum of 5 academic studies related to the global burden of disease has been identified as 234. When the citations of these authors were analyzed, it was found that they concentrated on writers such as Murray C.J.L., Lopez A.D., Vos T., Ezzati M., Mathers C.D., Naghavi, M., Whiteford H.A, Ferrari A.J., Forouzanfar M.H., and Rehm J. At the same time, it is possible to see the fatigue of the references made on the figure according to years.

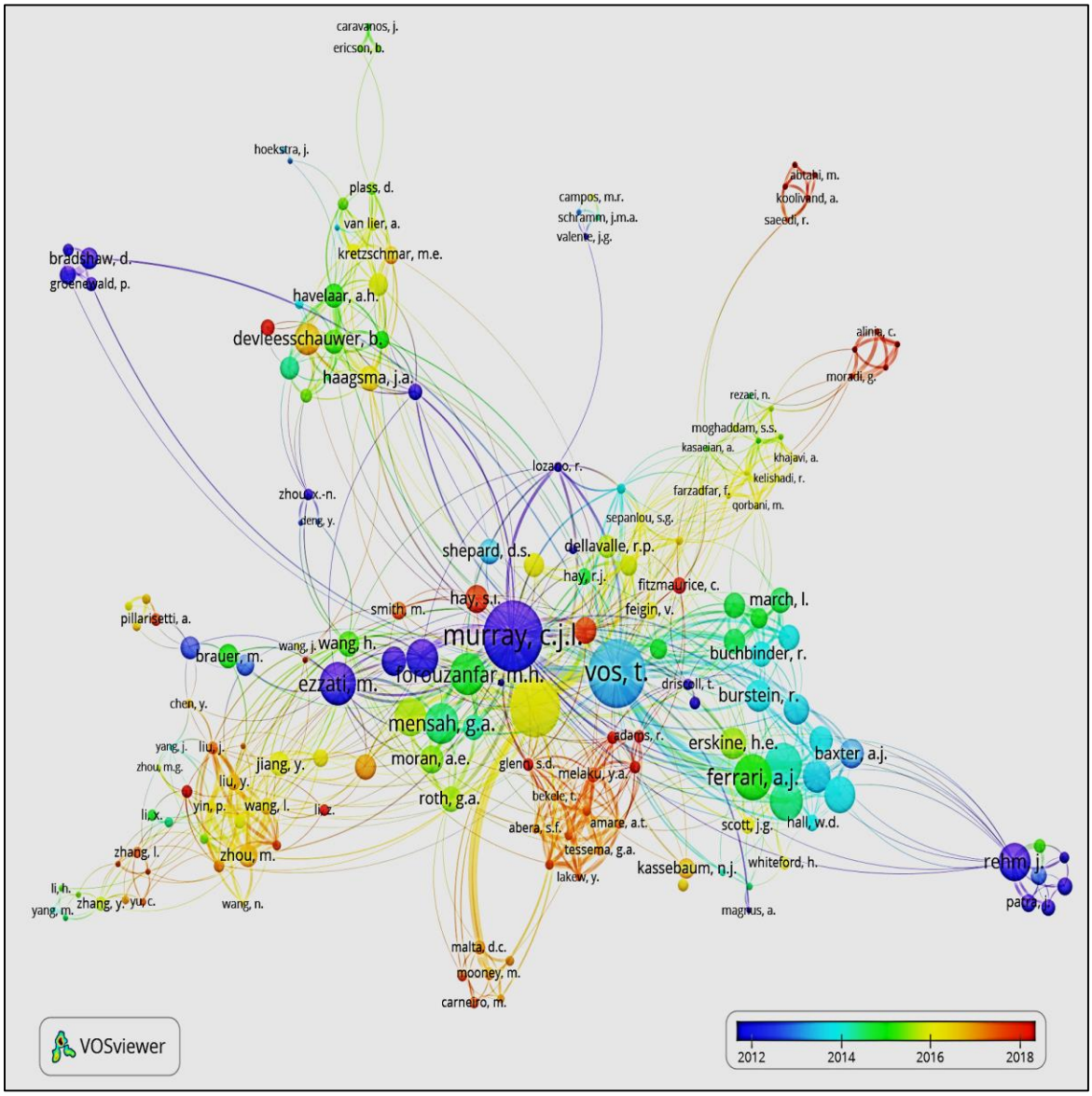

Figure 5. Author Network Map on Global Burden of Disease

4. Discussion

Reliable and timely information about the leading causes of death of the population and how they change is an important input in health policy discussions (Lozano et al., 2012:2095). An important input to health decision making and planning is a consistent and comparative description of the burden of disease and injury and the associated risk factors (Lopez, et al., 2006:1747). Global and regional estimates of mortality and burden of disease by cause to 2000, 2010 and 2030 were published by Murray and Lopez in 1996 as part of the Global Burden of Disease (GBD) project (Mathers and Loncar, 2006: 2011). GBD provides a standardized approach to epidemiological assessment and uses a standard unit with a DALY to aid comparisons (Murray and Lopez, 1997a:1436).

Top 15 cited articles on global burden of disease are given in Table 3. Accordingly, the most important findings obtained in these studies are presented below. In a study conducted by Lozano et al. (2012), the most aggregate level, communicable, maternal, neonatal, and nutritional causes were 24.9% of deaths worldwide in 2010, down from 15.9 million (34.1%) of 46·5 million in 1990. Lim et al. (2012) identified 67 risk factors that affect global disease burden in 2010. According to these three leading risk factors for global disease burden were high blood pressure (7.0% of global DALYs), tobacco smoking including second-hand smoke (6.3%), and alcohol use (5.5%). In 1990, the leading risks were childhood underweight (7.9%), household air pollution from solid fuels (7.0%), and tobacco smoking including second-hand smoke (6.1%). Dietary risk factors and physical inactivity collectively accounted for 10.0% of global DALYs in 2010.

GBD depends strongly on the assumption that future mortality trends in poor countries will have a relationship to economic and social development Mathers and Loncar, 2006:442). Worldwide mortality from communicable maternal, perinatal, and nutritional disorders was expected to decline in the baseline scenario from 17.2 million deaths in 1990 to 10.3 million in 2020 (Murray and Lopez, 1997c:1498). Because of the established health risks and substantial increases in prevalence, obesity has become a major global health challenge (Ng et al., 2014:766). The ten leading specific causes of global DALYs are, in descending order, lower respiratory infections, diarrheal diseases, perinatal disorders, unipolar major depression, ischemic heart disease, cerebrovascular disease, tuberculosis, measles, road-traffic accidents, and congenital anomalies (Murray & Lopez, 1997a: 1436). Health systems will need to meet the needs of an increase in the number of individuals with a range of disabling but non-lethal disorders that cause major disability. Measuring the burden of non-fatal health outcomes will be crucial to understanding how well

health systems respond to these challenges. Effective and affordable strategies to deal with this increasing burden are an urgent priority for healthcare systems in most parts of the world (Vos et al., 2012:2164).

Table 3. Top 15 Cited Articles on Global Burden of Disease

	Authors	Document Title	Cited by
1	Lozano et al., 2012	Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: A systematic analysis for the Global Burden of Disease Study 2010	7.033
2	Lim et al., 2012	A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010	6.197
3	Mathers and Loncar, 2006	Projections of global mortality and burden of disease from 2002 to 2030	5.602
4	(Murray and Lopez, 1997b)	Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study	5.164
5	Ng et al., 2014	Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: A systematic analysis for the Global Burden of Disease Study 2013	4.882
6	Murray et al., 2012)	Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010	4.676
7	Vos et al., 2012	Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010	3.772
8	Lopez et al., 2006	Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data	3.581
9	Naghavi, et al., 2015	Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	3.454
10	Murray & Lopez, 1997c	Mortality by cause for eight regions of the world: Global Burden of Disease Study	3.178
11	Murray & Lopez, 1997a	Global mortality, disability, and the contribution of risk factors: Global burden of disease study	3.030
12	Lee et al., 2012	Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy	2.976
13	Vos et al., 2015	Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Dişesek Study 2013	2.552
14	Ezzati et al., 2002	Selected major risk factors and global and regional burden of disease	2.490
15	Whiteford et al., 2013	Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010	2.258

4. Conclusion

For an effective health system, it is necessary to determine the health problems of their countries and how these health changes. The GBD study measures both mortality and morbidity of a particular disease and identifies the risk factor. It is known that there is increasing interest in the global burden of disease in all countries in the world. For this purpose, scientific researches related to global burden of disease were analyzed by bibliometric methods. It has been found that academic studies related to global burden of disease increased rapidly especially after the 2000s. Therefore, there is significant bibliographic data on the global burden of disease. However, as of the date of the study, there was no bibliometric study on the global burden of disease. Research on the global burden of disease is most financially supported by institutions in the United States. Therefore, most academic publications are made by researchers in this country. Murray and Lopez are the most cited US citizens.

The first research on the disease burden in Turkey was built in 2004. The research was funded by the Ministry of Health. But it could not reach comprehensive research on Turkey in many international publications. It is thought that both the ministry of health and universities should give more importance in this field. In addition, academicians who will carry out academic studies in this field should be trained in universities.

References

Charlson, F. J., Stapelberg, N. J. C., Baxter, A. J., & Whiteford, H. A. (2011). Should Global Burden of Disease Estimates Include Depression as a Risk Factor for Coronary Heart Disease? *BMC Medicine*, 9 (47), 1-6.

Ezzati M, Lopez AD, R. A. et al. (2002). Comparative Risk Assessment Collaborating Group: Selected major risk factors and global and regional burden of disease. *Lancet*, 360, 1347–1360.

Gold, M. R., & Muennig, P. (2002). Measure-dependent variation in burden of disease estimates: Implications for policy. *Medical Care*, 40(3), 260–266.

Hong, K.-S., & Saver, J. L. (2010). Years of Disability-Adjusted Life Gained as a Result of Thrombolytic Therapy for Acute Ischemic Stroke. *Stroke*, 41(3), 471–477.

IHME, (2019). The Institute for Health Metrics and Evaluation, http://www.healthdata.org/, 01.10.2019.

Knol, A. B., Petersen, A. C., Van Der Sluijs, J. P., & Lebret, E. (2009). Dealing with uncertainties in environmental burden of disease assessment. *Environmental Health: A Global Access Science Source*, 8(21),1-13

Krishnamoorthy, K., Harichandrakumar, K. T., Kumari, A. K., & Das, L. K. (2009). Burden of Chikungunya in India: Estimates of disability adjusted life years (DALY) lost in 2006 epidemic. *Journal of Vector Borne Diseases*, 46(1), 26–35.

Lee, I.-M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., Katzmarzyk, P. T., … Wells, J. C. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet*, 380(9838), 219–229.

Lim, S. S., Vos, T., Flaxman, A. D., Danaei, G., Shibuya, K., Adair-Rohani, H., … Barker-Collo, S. (2012). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010. *Lancet*, 380(9859), 2224–2260.

Lopez, A. D., Mathers, C. D., Ezzati, M., Jamison, D. T., & Murray, C. J. (2006). Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *Lancet*, 367(9524), 1747–1757.

Lozano, R., Naghavi, M., Foreman, K., Lim, S., Shibuya, K., Aboyans, V., … Murray, C. J. L. (2012). Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: A systematic analysis for the Global Burden of Disease Study 2010. The *Lancet*, 380(9859), 2095–2128.

Massey RU, Rosen AK, Loveland S, et al.(1978). Cost of care or burden of disease? Applying diagnostic cost groups to examine the disease burden of VA facilities: comparing the six "Evaluating VA Costs" study sites with other VA sites and medicare. The burden of disease and the cost of illness attributable to alcohol drinking--results of a national study. Conn Med., 42:263

Mathers, C.D., & Loncar, D. (2006). Projections of global mortality and burden of disease from 2002 to 2030. *PLoS Medicine*, 3(11), 2011–2030.

Michaud, C. M., Murray, C. J. L., & Bloom, B. R. (2001). Burden of disease - Implications for future research. *Journal of the American Medical Association*, 285(5), 535–539.

Murray, C. J. ., & Lopez, A. D. (1997a). Global mortality, disability, and the contribution of risk factors: Global burden of disease study. *Lancet*, 349(9063), 1436–1442.

Murray, C. J. L., & Lopez, A. D. (1997b). Alternative projections of mortality and disability by cause 1990–2020: Global Burden of Disease Study. *Lancet*, 349, 1498–1504.

Murray, C. J. L., & Lopez, A. D. (1997c). Mortality by cause for eight regions of the world: Global Burden of Disease Study. *Lancet*, 349(9061), 1269–1276.

Murray, C. J. L., Vos, T., Lozano, R., Naghavi, M., Flaxman, A. D., Michaud, C., … Lopez, A. D. (2012). Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010. *Lancet*, 380(9859), 2197–2223

Naghavi, M., Wang, H., Lozano, R., & Davis, A. (2015). Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*, 385(9963), 117–171.

Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., … Gakidou, E. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: A

systematic analysis for the Global Burden of Disease Study 2013. *Lancet*, 384(9945), 766–781.

Vos, T., Flaxman, A. D., Naghavi, M., Lozano, R., Michaud, C., Ezzati, M., … Murray, C. J. L. (2012). Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: A systematic analysis for the Global Burden of Disease Study 2010. *Lancet*, 380(9859), 2163–2196.

Vos, Theo, Barber, R. M., Bell, B., Bertozzi-Villa, A., & Biryukov, S. (2015). Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*, 386(9995), 743–800.

Whiteford, H. A., Degenhardt, L., Rehm, J., Baxter, A. J., Ferrari, A. J., Erskine, H. E., … Vos, T. (2013). Global burden of disease attributable to mental and substance use disorders: Findings from the Global Burden of Disease Study 2010. *Lancet*, 382(9904), 1575–1586.

Würthwein, R., Gbangou, A., Sauerborn, R., & Schmidt, C. M. (2001). Measuring the local burden of disease. A study of years of life lost in sub-Saharan Africa. *International Journal of Epidemiology*, 30(3), 501–508.

Yiğit A. Yiğit V. (2019). Economic burden of obesity-related comorbidities in Turkey, Gümüşhane University Journal of Health Sciences, 8(3): 223-230.

Zan, B. U. (2012). Türkiye'de Bilim Dallarında Karşılaştırmalı Bibliyometrik Analiz Çalışması. Yayınlanmış Doktora Tezi. Üniversitesi Sosyal Bilimler Enstitüsü, Ankara.