



The Evolution of Spirituality, Religion and Health Publications: Yesterday, Today and Tomorrow

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Abstract

This research aims to present a bibliometric analysis of the published documents on spirituality, religion and health. Despite the increasing number of publications spirituality, religion and health research in recent years, there is still little information about the effects of these publications in the literature. “*Religion*,” “*spirituality*,” “*spiritual*,” “*health*” and “*medicine*” keywords were used to search the Web of Science (WoS) database. Bibliometric analysis was conducted on the articles published between 1975 and 2017. The analysis was presented with network and density maps. The analysis also included the regression analysis to predict a number of publications in 2018. A total number of 1674 publications were found: 818 of these publications were articles. Of the 818 articles, 210 were religion, 198 were Public Environmental Occupational Health, 139 were Psychology, and 77 were performed in the field of Psychiatry. The most productive journal with 107 articles and 1129 citations was the Journal of Religion and Health. The USA (495; 60.5%) was the most productive country on spirituality, religion and health publications. The author who had the highest number of publications and citations was Koenig HG (33 publications; 4.03% and 1617 citations), the document who had the highest number of citations was Ellison CG and Levin JS (633 citations), and the author who had the highest number of citations in the references was Koenig HG, 2001, (126 citations). Duke Univ was the top institution in the number of publication (50 Article). This study will lead the researchers especially in terms of the important journals, active countries, authors, top-cited articles and current topics in spirituality, religion and health research.

Keywords Spirituality · Religion · Health · Medicine · Bibliometrics

Introduction

Spirituality was defined as “the personal quest for understanding answers to ultimate questions about life, about meaning and about relationship to the sacred or transcendent, which may (or may not) lead to or arise from the development of religious rituals and the formation of community” (Koenig et al. 2001), and religion was defined as “an organized

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system of beliefs, practices, rituals and symbols designed to facilitate closeness to the sacred or transcendent (God, higher power, or ultimate truth/reality) by Koenig et al. (2001) and Damiano et al. (2016). Religion and spirituality are two different concepts related to belief. Spirituality is all of the spiritual values and behaviors that cause a person to have good or bad characteristics. Religion is belief in a God and the practices that are related with this belief, such as worshiping in a church, mosque or temple.

Bibliometric analysis is the method that provides statistical analysis of publications such as articles and books (Şenel and Demir 2018; Ozsoy and Demir 2018). Citation analysis is a way of measuring the relative impact of an article, publication or author by counting how many times it has been cited by other studies (Muslu 2018; Senel et al. 2016). Advanced bibliometric analysis is an important method for determining the authors, articles or institutions. Many bibliometric researchers have been carried out in various fields (Van Raan 2003; Clarke et al. 2007) since the bibliometric study by Garfield was published in JAMA Journal in 1987 (Ozsoy and Demir 2017; Garfield 1987).

The number of researchers interested in this field has been increasing rapidly in recent years. Although the publications of religion have increased rapidly in recent years, there is still very little information about the effects of these publications in the literature. This research aims to present a bibliometric analysis of the published documents on spirituality, religion and health (SR/H) research during 1975–2017.

Materials and Methods

The data analyzed in this study were obtained from Web of Science (WoS; Thomson Reuters, New York, NY, USA) index on 23 February 2018. “*Religion*” and “*health*” or “*religion*” and “*medicine*” or “*spirituality*” and “*health*” or “*spiritual*” and “*health*” or “*spirituality*” and “*medicine*” or “*spiritual*” and “*medicine*” keywords were used to search the WoS database. The documents published between 1975 (Publications before 1975 are not available in the WoS) and 2017 were included in the study. Bibliometric network visualizations were performed by using VOSviewer (version 1.6.6) software (Van Eck and Waltman 2010). Regression analyses were conducted using SPSS (version 22.0, SPSS Inc., Chicago, IL, USA, license: Hitit University). Regression analysis with curve fitting was used to estimate the number of publications in the year 2018. A P value < 0.05 was considered statistically significant.

Results

A total number of 1674 publications were found in the WoS database. Of all these publications, 818 (48.87%) were articles, 364 (21.74%) book reviews, 157 (9.38%) meeting abstracts, 125 (7.47%) editorial materials, 86 (5.14%) letters, 60 (3.58%) reviews, 58 (3.47%) proceedings papers, and the remaining publications 32 (1.91%). A total of 818 articles received 14,137 total citations (without self-citations 12,928), and the average number of citations per publication was 17.28. By language, 766 (93.6%) of these articles have been published in English, 15 (1.8%) in French, 13 (1.6%) in German, 7 (0.9%) in Portuguese, 5 (0.6%) in Spanish, 2 (0.2%) in Czech, 2 (0.2%) in Italian, 2 (0.2%) in Russian, 1 (0.1%) in Hungarian, 1 (0.1%) in Serbian, 1 (0.1%) in Slovak, 1 (0.1%) in Slovenian, 1 (0.1%) in Ukrainian and 1 (0.1%) in Turkish. Additionally, active research areas on SR/H are given in Table 1.

Table 1 Active research areas on spirituality, religion and health

Journals	RC	%	Authors	RC	%
Religion	210	25.6	Education Educational Research	23	2.81
Public Environmental Occupational Health	198	24.2	Oncology	17	2.08
Psychology	139	17.0	Social Work	15	1.83
Psychiatry	77	9.41	History	13	1.59
General Internal Medicine	64	7.81	Rehabilitation	12	1.47
Nursing	59	7.20	Family Studies	10	1.22
Health Care Sciences Services	53	6.47	Social Issues	10	1.22
Biomedical Social Sciences	45	5.50	Government Law	9	1.10
Geriatrics Gerontology	39	4.76	History Philosophy of Science	9	1.10
Sociology	38	4.64	Neurosciences Neurology	9	1.10
Social Sciences Other Topics	29	3.54	Pediatrics	9	1.10
Integrative Complementary Medicine	27	3.30			

RC record count

Development of Publications and Citations and Prediction of the Publications for 2018

The distribution of the number of publications and citations by years is shown in Figs. 1 and 2, respectively. There seems to be a significant increase in the number of publications and citations after 1999 (see Figs. 1, 2). Besides, cubic curves were fitted to estimate the number of publications in 2018. The publication number on the topic of SR/H for 2018 was estimated by using publication numbers based on the publications between 1975 and 2017. It could be calculated that the estimated publication number will be 82 ($R^2 = 0.964$) in 2018. The cubic curve is given in Fig. 3.

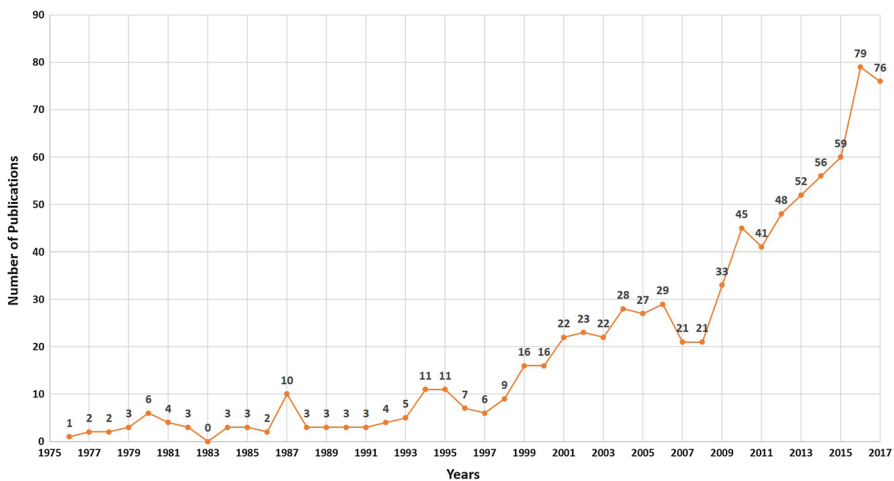


Fig. 1 Distributions of publications according to years on the topic of spirituality, religion and health

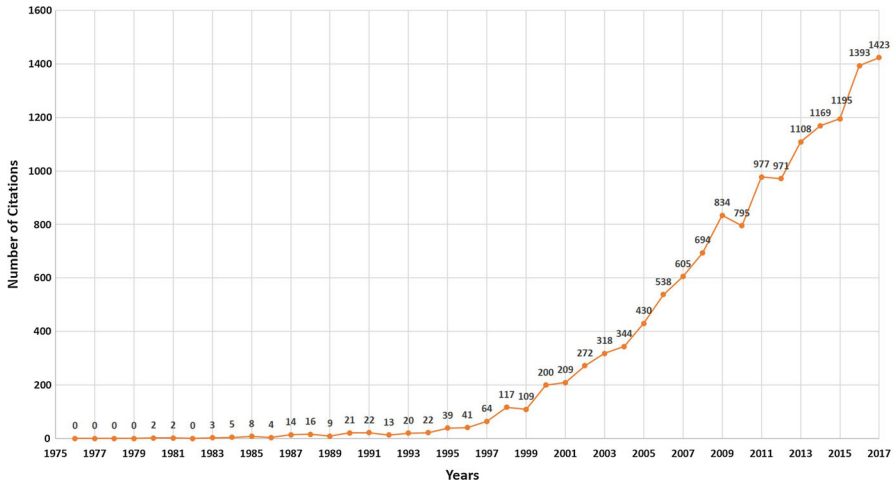


Fig. 2 Distributions of citations according to years on the topic of spirituality, religion and health

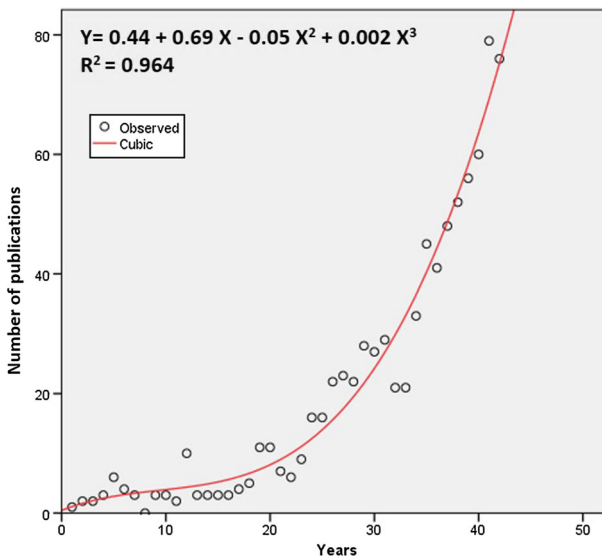


Fig. 3 Number of publications by year with curve estimation

Productive Countries

Authors from 63 different countries contributed to the literature about SR/H. The USA, with 495 (60.5%) publications, was the most productive country, which was followed by England (39), Canada (36), Iran (29), Australia (28), Germany (26), Brazil (19), India (17), Saudi Arabia (15), South Africa (15), Israel (13), China (11), Sweden (10), Switzerland (10), France (9), Scotland (9), Taiwan (8), Austria (7), Italy (6), Japan (6) and Norway (6), respectively. The distribution of the number of publications according to world countries is presented on the world map (see Fig. 4).

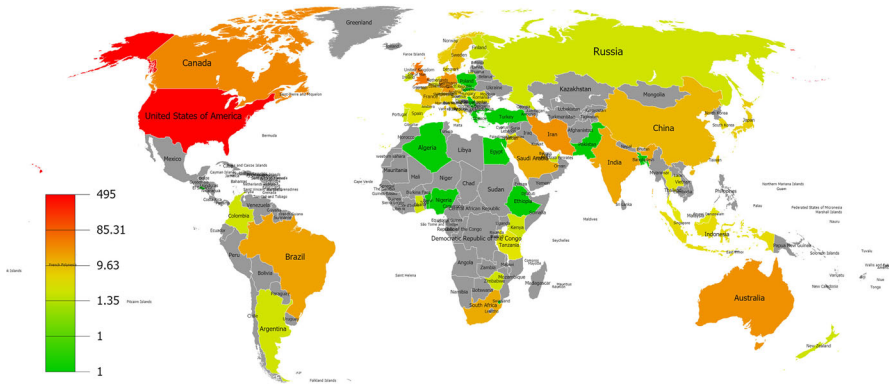


Fig. 4 Total publication density of world countries in spirituality, religion and health research

In addition, international collaboration between the active countries was investigated. A bibliometric analysis was performed with 33 countries (out of 63) which had at least 3 articles (6 countries without international collaboration not included on the map) and is presented in Fig. 5. Australia, Austria, Canada, Italy and Tanzania were in the first cluster; Iran, Israel, Norway, China and Sweden were in the second cluster; Brazil, Denmark, India, Indonesia and Saudi Arabia were in the third cluster; Japan, South Korea, Thailand and the USA were in the fourth cluster; England, Jordan and Wales were in the fifth cluster; Belgium, Germany and South Africa were in the sixth cluster; France and Switzerland were in the seventh cluster. All collaborations are demonstrated in Fig. 5.

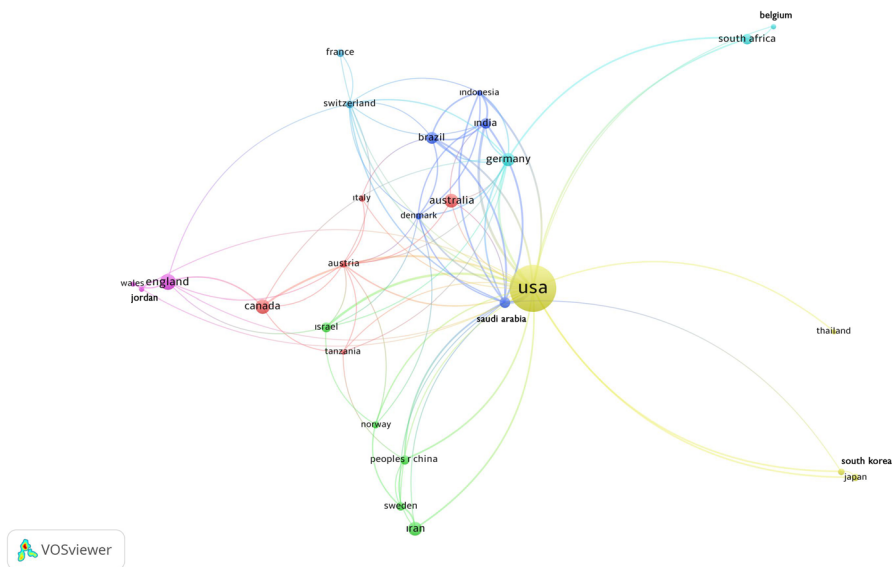


Fig. 5 Network visualization map of international collaboration between active countries. Circle size shows the number of publications, colors cluster and lines show collaborations (Color figure online)

Active Journals

Table 2 shows the top active 22 journals with the highest number of publications about SR/H. “Journal of religion and health” journal had the highest number of publications (107, 13.1%) and citations (1129 citations), and the second highest number of publications was in the “Religions” journal (14; 1.7%). Other journals are given in Table 2. Figure 6 demonstrates network visualization map of citation analysis of active journals with 31 (out of 418) journals which had minimum of 4 articles.

Active Institutions

The highest number of publications is from Duke University (48; 5.9%), and the second highest number of publications is from University of Michigan (24; 2.9%). Figure 7 shows network visualization of citations analysis of active institutions. Other institutions are seen in Fig. 7.

Active Authors

According to the number of publications, the authors who contributed most to the literature are shown in Table 3. The author with the highest number of publications (33; 4.0%) and citations (1617) was Koenig HG (33; 4.0%). Other authors are shown in Table 3.

Table 2 Active journals on spirituality, religion and health

Journals	RC	C	Authors	RC	C
Journal of Religion & Health	107	1129	Annals of Behavioral Medicine	6	797
Religions	14	123	Journal of Psychology and Theology	6	87
Journal of Behavioral Medicine	11	325	Journal of Spirituality in Mental Health	6	8
Social Science & Medicine	11	948	Psychology of Religion and Spirituality	6	67
International Journal of Psychiatry in Medicine	11	287	Research on Aging	6	467
Southern Medical Journal	9	286	International Review of Psychiatry	6	241
Journal of Advanced Nursing	8	268	Alternative Therapies in Health and Medicine	5	97
International Journal for the Psychology of Religion	8	108	Journal of Medical Ethics	5	14
Academic Medicine	7	244	Mental Health Religion & Culture	5	0
Journal for the Scientific Study of Religion	7	272	Psycho-Oncology	5	154
Review of Religious Research	7	83	International Journal of Children’s Spirituality	5	22

RC record count, C number of citation

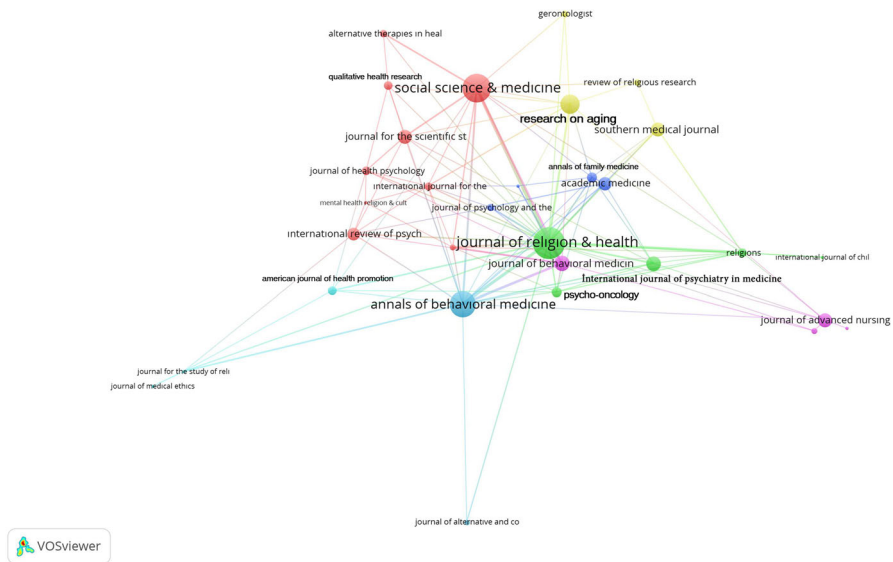


Fig. 6 Network visualization map of citation analysis of active journals. Circle size shows the number of citations

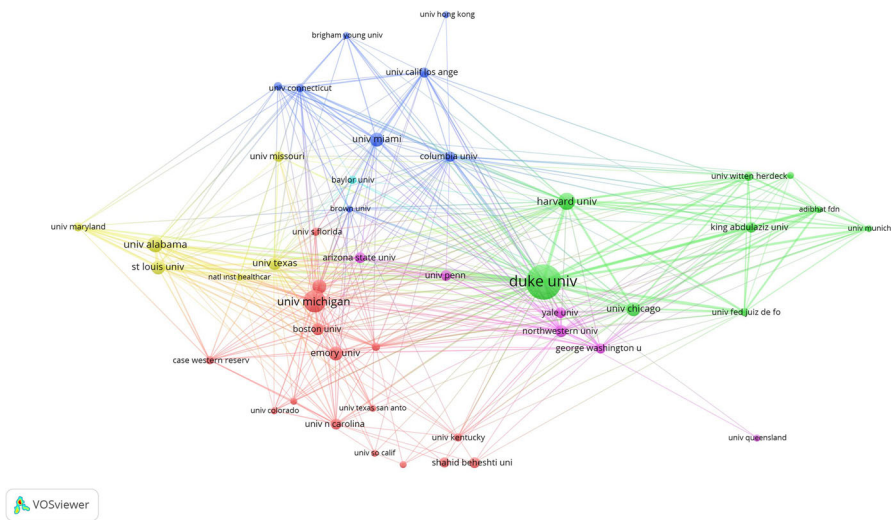


Fig. 7 Network visualization map of citation analysis of active organizations. Circle size shows the number of publications, 46 institutions (out of 852) with minimum 5 publications. Top 3 institutions by number of publications are Duke Univ (44 Article, 2070 citations), Univ. Michigan (23 Article, 882 citations), Harvard Univ. (16 Article, 312 citations) respectively

Co-Citation Analysis

Figure 8 demonstrates the density map of co-citation analysis of 50 (out of 23,627 cited references) articles who were cited minimum 20 times. Top-cited 5 articles in references

Table 3 Active authors on spirituality, religion and health

Authors	RC	%	C	Authors	RC	%	C
Koenig HG	33	4.03	1617	Flannelly KJ	7	0.86	123
Krause N	16	1.95	498	Johnstone B	7	0.86	141
Levin JS	14	1.71	597	Puchalski CM	7	0.86	283
Lucchetti G	13	1.57	77	Yoon DP	7	0.86	141
Holt CL	11	1.34	266	George LK	6	0.73	923
Curlin FA	10	1.22	282	Hsiao YC	6	0.73	47
Pargament KI	10	1.22	386	Ironson G	6	0.73	221
Clark EM	8	0.98	134	Masters KS	6	0.73	79
Larson DB	8	0.98	946	Park CL	6	0.73	191
Bussing A	7	0.86	26	Ramakrishnan P	6	0.73	24
Ellison CG	7	0.86	1008				

RC record count, C number of citation

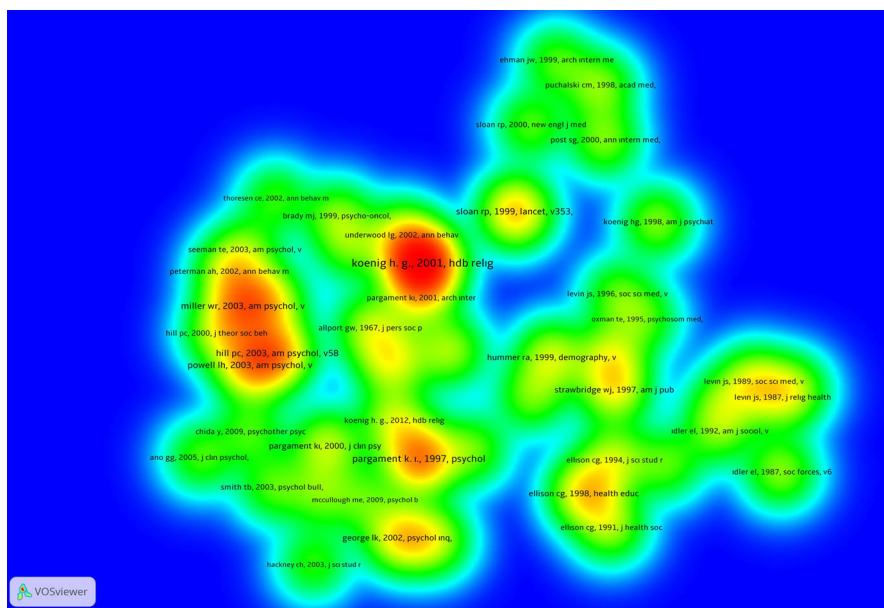


Fig. 8 Density visualization map of co-citation analysis of articles in cited references. Colors that become more intense from green to red show the multitude of citations the article has received (Color figure online)

included “Koenig et al. (2001)” (126 citation) “Pargament (1997)” (69 citation), “Sloan et al. (1999)” (54 citation), “Hill et al. (2003)” (54 citation) and “Powell et al. (2003)” (53 citation), respectively (Fig. 8).

Top-Cited Articles

Table 4 demonstrates the 15 most cited manuscripts on SR/H between 1975 and 2017. According to a total number of citations, with total 633 and average 90.40 citations yearly, the article entitled “The religion-health connection: Evidence, theory, and future directions” written by Ellison and Levin (1998) was the top-cited article. The second most cited publication was the study entitled “The daily spiritual experience scale: Development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data” written by Underwood and Teresi (2002).

Frequently Used Terms

Network visualization map of most frequently used keywords in abstracts according to years is shown in Fig. 9. Of the 1273 terms in the abstracts of the 818 articles, 47 words occurred more than 5 times. The most frequently used 10 keywords are spirituality (number of use; 247), religion (169) health (91), mental health (59), religiosity (35), depression (21), quality of life (21), spiritual care (21), spiritual health (17), medicine (16), respectively (see Fig. 9). The other keywords are given in Table 5.

Discussion

Parallel to the development of complementary and alternative medicine applications, the number of publications on SR/H has increased rapidly in recent years. But there are so few bibliometric studies in the literature on this subject. We found two bibliometric studies in the literature (Damiano et al. 2016; Lucchetti and Lucchetti 2014). This bibliometric research, which includes a world map, the largest network visualization maps, international collaborations and publication forecasting, is the most comprehensive study in the literature.

The USA was the most contributed country, which was followed by England and Canada, according to a number of publications in this area. In the SR/H researches, it was found that not only the developed countries but also the developing countries like Iran, Brazil, India, Saudi Arabia and South Africa contributed a considerable amount to the literature. The article entitled “Spirituality, Religion, and Health: Over the Last 15 Years of Field Research (1999–2013)” written by Lucchetti and Lucchetti (2014) and published in “The International Journal of Psychiatry” journal reported last 15 years’ articles about SR/H in the literature and analyzed the features of these articles. Similarly, this article has already stated the significant contribution of these countries (Lucchetti and Lucchetti 2014). Unlike these studies, the present study found that “Journal of Religion and Health” was featured and the most contributed journal in this area. Journal of Religion and Health is an important journal in the field of SR/H.

The Duke University was the most contributed university, which was followed by the University of Michigan, according to a number of publications. Also we estimate the number of publications to be published in 2018. According to curve fitting results, we estimate that there will be 82 publications in 2018 in the WoS database on the topic of SR/H.

Top-cited three authors were found to be Koenig HG, Krause N and Levin JS, in our study. On the other hand, Koenig HG, Pargament KI and Sloan RP were the most frequently co-cited authors, respectively, according to co-citation analysis of active authors.

Table 4 The 15 most cited manuscripts on spirituality, religion and health

Nos.	Article	Author	Journal	PY	TC	AC
1	The religion-health connection: Evidence, theory, and future directions	Ellison, CG; Levin, JS	Health Education & Behavior	1998	633	30.14
2	The daily spiritual experience scale: Development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data	Underwood, LG; Teresi, JA	Annals of Behavioral Medicine	2002	394	23.18
3	Measuring multiple dimensions of religion and spirituality or health research: Conceptual background and findings from the 1998 General Social Survey	Idler, EL; Musick, MA; Ellison, CG; George, LK; Krause, N; et al.	Research on Aging	2003	297	18.56
4	Spirituality and health: What we know, what we need to know	George, LK; Larson, DB; Koenig, HG; McCullough, ME	Journal of Social and Clinical Psychology	2000	277	14.58
5	Long-term health-related quality of life, growth, and spiritual well-being after hematopoietic stem-cell transplantation	Andrykowski, MAA; Bishop, MM; Hahn, EA; Cella, DF; Beaumont, JL; et al.	Journal of Clinical Oncology	2005	174	12.43
6	Religion, spirituality, and health in medically ill hospitalized older patients	Koenig, HG; George, LK; Titus, P	Journal of the American Geriatrics Society	2004	178	11.87
7	Religion, spirituality, and medicine: Research findings and implications for clinical practice	Koenig, HG	Southern Medical Journal	2004	175	11.67
8	Mindfulness, spirituality, and health-related symptoms	Carmody, James; Reed, George; Kristeller, Jean; Merriam, Phillip	Journal of Psychosomatic Research	2008	128	11.64
9	Religion and mental health: evidence for an association	Koenig, HG; Larson, DB	International Review of Psychiatry	2001	206	11.44
10	Religiousness/spirituality and health: A meaning systems perspective	Park, Crystal L.	Journal of Behavioral Medicine	2007	131	10.92
11	Religion and health: is there an association, is it valid, and is it causal	Levin, JS	Social Science & Medicine	1994	267	10.68
12	The ironson-woods spirituality/religiousness index is associated with long survival, health behaviors, less distress, and low cortisol in people with HIV/AIDS	Ironson, G; Solomon, GF; Balbin, EG; O'Cleirigh, C; George, A; et al.	Annals of Behavioral Medicine	2002	173	10.18

Table 5 Most used 47 keywords in abstracts on spirituality, religion and health

Keyword	O	Keyword	O	Keyword	O
Spirituality	247	Complementary and alternative medicine	9	Recovery	7
Religion	169	Coping	9	Religious coping	7
Health	91	Ethics	9	Stress	7
Mental health	59	Healing	9	Adolescence	6
Religiosity	35	Health care	9	African American	6
Depression	21	Religion and medicine	9	Elderly	6
Quality of life	21	Spiritual well-being	9	Happiness	6
Spiritual care	21	Education	8	Health status	6
Spiritual health	17	Mindfulness	8	Holistic care	6
Medicine	16	Religiousness	8	HIV	6
African Americans	12	Adolescents	7	HIV/AIDS	6
Nursing	12	Culture	7	Life satisfaction	6
Social support	10	Health behaviors	7	Medical education	6
Well-being	10	Health-related quality of life	7	Prayer	6
Aging	9	Measurement	7	Qualitative research	6
Cancer	9	Psychiatry	7		

O occurrences

“*adolescence*” and “*health-related quality of life*,” “*recovery*,” “*mental health*,” “*healing*.” This indicated that spirituality and religion are important concepts in healthy life.

The present study had one limitation. We did not use PubMed, Google Scholar or Scopus databases which include more documents than Web of Science (WoS). We preferred the WoS database because it published articles in journals with high impact factors. Besides the first publication was in 1961 in Journal of Religion and Health, we could obtain publications in 1975 and beyond by searching in WoS.

Conclusion

This research found that there was a significant increase in the number of publications between the years 1999 and 2017, particularly after 2009. According to the results of this study, “Journal of Religion and Health” was featured and was the most effective journal in this area. The USA was the leading publisher according to a number of publications in this area. Although developed countries are the most productive countries in terms of contribution to the literature publications, contribution in some developed countries, such as Iran, Brazil, India, Saudi Arabia, South Africa, had significantly higher amounts.

Spirituality, religious beliefs and health are important concepts that complement each other in the improvement of patient health. This study will lead the researchers especially in terms of the important journals, active countries, authors, top-cited articles and current topics in SR/H research.

Compliance with Ethical Standards

Conflict of interest The author declares that he has no conflict of interest.

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