

Classic Citations in Main Primary Health Care Journals

A PRISMA-Compliant Systematic Literature Review and Bibliometric Analysis

Hongmei Li, MD, Xiyan Zhao, MD, Ping Zheng, MD, Mei Hu, MD, Yan Lu, MD,
Fukun Jia, MD, and Xiaolin Tong, MD, PhD

Abstract: The impact of a publication in a particular medical area is reflected by the number of times the article is included as a citation. It is not known, however, which articles are cited the most in primary care journals. In our study, we aimed to identify the 100 most cited articles in primary care medicine and analyze their characteristics.

We searched the Science Citation Index Expanded for articles published in 18 primary care journals using the subject category "Primary health care." We identified 100 articles in primary health care that were the most cited. We analyzed the characteristics of these articles using the title, number of citations, citation density, year of publication, journal source, decade published, country of origin, institution, author names, and type of article.

The 100 articles that were cited the most were published between the years 1977 and 2009. The 1990s decade was the most productive decade. The number of citations ranged from 117 to 775. The articles were published in 9 journals and the journal with the largest number of most cited articles (n=33) was the *Journal of Family Practice*. This was followed by the *British Journal of General Practice* (n=17) and the journal *Family Practice* (n=16). The United States was the most productive country (n=59); the United Kingdom was next (n=25) and this was followed by Canada (n=5) and The Netherlands (n=5). The most popular article type was a review article and this was followed by a qualitative study and then methodological study.

Our study provides insight into the historical development of primary care studies, based on citations, and provides the foundation for further investigations.

(*Medicine* 94(49):e2219)

Editor: Daryle Wane.

Received: October 1, 2015; revised: November 10, 2015; accepted: November 11, 2015.

From the Clinical Department in Beijing Space City, Beijing, China (HL, PZ, YL), The 306th Hospital of People's Liberation Army, Beijing, China (MH, FJ); Department of Endocrinology, Guang'anmen Hospital, China Academy of Chinese Medical Sciences, Beijing, China (XZ, XT); and Graduate School, Beijing University of Chinese Medicine, Beijing, China (XZ).

Correspondence: Fukun Jia, The 306th Hospital of People's Liberation Army, No.9 Anxiangbeili, Beijing 100101, China (e-mail: beijingjia-fukun@163.com).

Xiaolin Tong, Department of Endocrinology, Guang'anmen Hospital, China Academy of Chinese Medical Sciences, Beijing, China (e-mail: xiaolintong_66@126.com).

Hongmei Li and Xiyan Zhao contributed equally to this study as first authors. No funds were received in support of this study.

The authors have no conflicts of interest to disclose.

Copyright © 2015 Wolters Kluwer Health, Inc. All rights reserved.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

ISSN: 0025-7974

DOI: 10.1097/MD.0000000000002219

Abbreviations: ISI = Institute for Scientific Information, JCR = Journal Citation Reports.

INTRODUCTION

According to The Declaration of Alma-Ata, primary health care is essential health care based on scientifically sound and socially acceptable methods. It should be universally accessible to individuals and families, with their full participation, at a cost that is affordable in the community and country and should be carried out in a spirit of self-reliance and self-determination.¹ The purpose of a primary health care system is to provide better health for all. Many articles have been published on primary health care over a number of years, and the numbers of papers being published is increasing. Some classic papers have had dramatic effects on the promotion of primary health care. There has been little work, however, to identify these classic papers.

Many methods have been developed to evaluate the significance of scientific papers, and assessing citations is one of them. A citation is acknowledgement that a paper referenced a previously published article. A citation indicated the paper contributed something valuable to the field. Currently, citation analysis is widely used to evaluate the significance of published studies.²⁻⁴ Citation analysis is a bibliometric method that assesses the number of times an article is cited in other articles and it is considered to be a reliable approach for ranking articles. Articles that are cited often are thought of as having had a scientific impact. A well-cited article indicates it is a valuable paper in its field.^{5,6} Web of Science is often used to analyze citations in various medical fields, including respiratory medicine,⁷ oncology,⁸ emergency medicine,⁹ critical care medicine,¹⁰ rehabilitation,¹¹ otolaryngology,¹² obstetrics and gynecology,¹³ ophthalmology,¹⁴ anesthesiology,¹⁵ dermatology,¹⁶ nursing research,¹⁷ trauma,¹⁸ urology,¹⁹ radiology,²⁰ general surgery,²¹ neurosurgery,²² and integrative and complementary medicine.²³ Analyzing citations has made it possible to develop a better understanding of the characteristics of classic papers.

To date, no study has analyzed the most cited papers in the field of primary health care. Our aim was to identify the 100 most cited papers in primary health care and to determine the principal characteristics of these papers.

METHODS

The Research Ethics Committee of The 306th Hospital of the People's Liberation Army and Guang'anmen Hospital approved this study. We used the design of previous publications as models for the design of this study.⁷⁻²³ The study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) statement.²⁴

TABLE 1. List of Journals That Were Search With the Topic Heading “Primary Health Care” in the Web of Science

Journal
<i>Annals of Family Medicine</i>
<i>Primary Care Respiratory Journal</i>
<i>British Journal of General Practice</i>
<i>Journal of the American Board of Family Medicine</i>
<i>Family Practice</i>
<i>American Family Physician</i>
<i>BMC Family Practice</i>
<i>Scandinavian Journal of Primary Health Care</i>
<i>Physician and Sportsmedicine</i>
<i>Canadian Family Physician</i>
<i>Primary Care Diabetes</i>
<i>Australian Journal of Primary Health</i>
<i>Atencion Primaria</i>
<i>Family Medicine</i>
<i>Primary Care</i>
<i>European Journal of General Practice</i>
<i>Journal of Family Practice</i>
<i>Australian Family Physician</i>

A search with Science Citation Index Expanded of the ISI Web of Science (Thomson Reuters, Philadelphia, PA) was performed on December 6, 2014, which was conducted in a similar manner to previous studies.^{5,6,16–18,21,25,26} There were 18 journals found with the subject category “Primary health care” in Journal Citation Reports (JCR) for the year 2013. All 18 journals were used in our study (Table 1).

We used the “OR” operator when placing the journal titles in the search window so that all articles published in the 18 journals were included. We recorded the 100 articles that were cited the most in relation to primary health care. The basic information was recorded and then analyzed according to the methods of previous studies.^{5,18,19,23,27} We included the title, number of citations, journal source, citation density, year of publication, decade the article was published, country of origin, institution, author names, and type of article. The address provided for the first author was used to determine the institution and country of origin. The citation density was calculated using the total number of citations divided by the number of years since publication.

RESULTS

Table 2 shows the number of citations and top 100 articles. The number of citations was 117 to 775 (Table 2). For the 100 most cited papers, the mean number of citations was 186. The oldest article was published in 1977 and it was ranked number 52. The newest articles were published in 2009 and the 3 articles published in 2009 were listed as 30, 31, and 36. The decade of the 1990s had the most articles (n = 50) and the 2000s had 41 articles, the 1980s had 7, and the 1970s had 2 published articles.

All of the articles in the top 100 list were written in English. Of the 18 journals, 9 contained articles in the top 100 list (Table 3). Most of the papers were published in the *Journal of Family Practice* (n = 33), and then the *British Journal of General Practice* (n = 17), and then *Family Practice* (n = 16). Ten countries contributed articles to the top 100 articles (Table 4). The most common country of origin was the United States

(n = 59), then the United Kingdom (n = 25), Canada (n = 5), and finally The Netherlands (n = 5). Eighty institutions contributed articles to the 100 most cited articles. The institution that contributed the most articles was The University of Western Ontario (n = 3) and then the School of Medicine, Oregon Health & Science University (n = 3; Table 5).

Some authors were represented in the top 100 list multiple times. Bertakis KD was the most common first author (n = 3) and Elwyn G was next (n = 2). They were followed by Mainous AG 3rd (n = 2), Safran DG (n = 2), Saultz JW (n = 2) Smilkstein G (n = 2), and finally Williams S (n = 2). The most common type of article in the top 100 was a review article (n = 31), following by qualitative research (n = 27) and then a methodological study (n = 12; Table 6).

The mean number of citations per year, which is considered the citation density, showed that the article by Viera and Garrett²⁸ was the top paper, and this paper was followed by one by Stewart et al²⁹ and one by Rubak et al (Table 2).³⁰ The article with the most citations (86 citations per year) was by Viera and Garrett.²⁸ This study was a methodological study that was published in 2005 and investigated the kappa statistic as an assessment of interobserver agreement. A cohort study by Stewart et al²⁹ (2000) had 48 citations per year and it investigated the impact of patient-centered care on outcomes. This study had the second most citations. The study with the third most citations was a systematic review. It was a meta-analysis by Rubak et al³⁰ (2005) and had 48 citations per year.

DISCUSSION

There has been much growth in research on primary health care in the last several decades.³¹ A large number of papers have been published on this topic. To understand the history and development of primary health care, we identified the classic articles that have been published. This will be helpful when designing future research studies. Our citation analysis is a widespread, common type of analysis that has been performed in many other fields of medicine.^{7–23} Our study was the first to analyze the most cited articles in the field of primary health care. The top 100 list of articles can be used to identify the milestone articles in the field of primary health care,^{25,32} and it shows the institutions and authors that have contributed to these landmark papers. It also allows identification of the authors that have subsequently led the field of primary health care.^{27,33} Our study also provides useful information about what is required for a paper to be considered as a classic paper.^{5,34} In addition, it can be a useful tool for the education of residents and fellowship directors in how classic articles in primary health care can become familiar papers.²⁶

There were 117 to 775 citations of the top 100 most cited articles in primary health care. This number was lower than other subspecialties such as hypertension (582–7248),³⁵ and the number was higher than other fields, such as integrative and complementary medicine (52–503).²³ This shows that different subspecialties have different citation rates. The size of the scientific community in the field can be a possible reason for this.³³ Most of the articles were published in the 1990s and 2000s, which was much later than articles published in other fields of medicine.^{8,18,32} Therefore, primary health care can be seen as a relatively “young” field. Primary health care was adopted in the declaration of the International Conference on Primary Health Care, which was held in Alma Ata, Kazakhstan in 1978. This conference addressed a wide range of research issues in the 1990s.³¹

TABLE 2. List of top 100 Articles for Number of Citations in the Field of Primary Health Care

Rank	Articles	No. of Citations (Citation Density)
1	Viera AJ, Garrett JM. Understanding interobserver agreement: the kappa statistic. <i>Fam. Med.</i> 2005; 37(5): 360–363.	775 (86)
2	Stewart M, Brown JB, Donner A, et al. The impact of patient-centered care on outcomes. <i>J. Fam. Pract.</i> 2000; 49(9): 796–804.	671 (48)
3	Jackson AS, Pollock ML. Practical assessment of body composition. <i>Physician Sport Med.</i> 1985; 13(5): 76–90.	519 (18)
4	Rubak S, Sandboek A, Lauritzen T, et al. Motivational interviewing: a systematic review and meta-analysis. <i>Br. J. Gen. Pract.</i> 2005; 55(513): 305–312.	432 (48)
5	Safran DG, Taira DA, Rogers WH, et al. Linking primary care performance to outcomes of care. <i>J. Fam. Pract.</i> 1998; 47(3): 213–220.	390 (24)
6	Smilkstein G. The Family APGAR: a proposal for a family function test and its use by physicians. <i>J. Fam. Pract.</i> 1978; 6(6): 1231–1239.	335 (9)
7	Jaén CR, Stange KC, Nutting PA. Competing demands of primary care: a model for the delivery of clinical preventive services. <i>J. Fam. Pract.</i> 1994; 38(2): 166–171.	309 (15)
8	Weiss BD, Mays MZ, Martz W, et al. Quick assessment of literacy in primary care: the newest vital sign. <i>Ann. Fam. Med.</i> 2005; 3(6): 514–522.	304 (34)
9	Bertakis KD, Roter D, Putnam SM. The relationship of physician medical interview style to patient satisfaction. <i>J. Fam. Pract.</i> 1991; 32(2): 175–181.	284 (12)
10	Marshall MN. Sampling for qualitative research. <i>Fam. Pract.</i> 1996; 13(6): 522–525.	273 (15)
11	Chew LD, Bradley KA, Boyko EJ. Brief questions to identify patients with inadequate health literacy. <i>Fam. Med.</i> 2004; 36(8): 588–594.	256 (26)
12	Elwyn G, Edwards A, Kinnersley P, et al. Shared decision making and the concept of equipoise: the competences of involving patients in healthcare choices. <i>Br. J. Gen. Pract.</i> 2000; 50(460): 892–899.	256 (18)
13	Fortin M, Bravo G, Hudon C, et al. Prevalence of multimorbidity among adults seen in family practice. <i>Ann. Fam. Med.</i> 2005; 3(3): 223–228.	255 (28)
14	Strecher VJ, Kreuter M, Den Boer DJ, et al. The effects of computer-tailored smoking cessation messages in family practice settings. <i>J. Fam. Pract.</i> 1994; 39(3): 262–270.	242 (12)
15	Stange KC, Zyzanski SJ, Jaén CR, et al. Illuminating the ‘black box’. A description of 4454 patient visits to 138 family physicians. <i>J. Fam. Pract.</i> 1998; 46(5): 377–389.	237 (15)
16	Bertakis KD, Azari R, Helms LJ, et al. Gender differences in the utilization of health care services. <i>J. Fam. Pract.</i> 2000; 49(2): 147–152.	236 (17)
17	Wensing M, van der Weijden T, Grol R. Implementing guidelines and innovations in general practice: which interventions are effective? <i>Br. J. Gen. Pract.</i> 1998; 48(427): 991–997.	235 (15)
18	Østbye T, Yarnall KS, Krause KM, et al. Is there time for management of patients with chronic diseases in primary care? <i>Ann. Fam. Med.</i> 2005; 3(3): 209–214.	232 (26)
19	D’Ath P, Katona P, Mullan E, et al. Screening, detection and management of depression in elderly primary care attenders. I: the acceptability and performance of the 15 item Geriatric Depression Scale (GDS15) and the development of short versions. <i>Fam. Pract.</i> 1994; 11(3): 260–266.	232 (12)
20	Hamm RM, Hicks RJ, Bemben DA. Antibiotics and respiratory infections: are patients more satisfied when expectations are met? <i>J. Fam. Pract.</i> 1996; 43(1): 56–62.	231 (13)
21	Difranza JR, Lew RA. Effect of maternal cigarette smoking on pregnancy complications and sudden infant death syndrome. <i>J. Fam. Pract.</i> 1995; 40(4): 385–394.	220 (12)
22	Davis TC, Crouch MA, Wills G, et al. The gap between patient reading comprehension and the readability of patient education materials. <i>J. Fam. Pract.</i> 1990; 31(5): 533–538.	212 (9)
23	Rosenthal TC. The medical home: growing evidence to support a new approach to primary care. <i>J. Am. Board Fam. Med.</i> 2008; 21(5): 427–440.	209 (35)
24	Smilkstein G, Ashworth C, Montano D. Validity and reliability of the family APGAR as a test of family function. <i>J. Fam. Pract.</i> 1982; 15(2): 303–311.	206 (6)
25	Elwyn G, Edwards A, Kinnersley P. Shared decision-making in primary care: the neglected second half of the consultation. <i>Br. J. Gen. Pract.</i> 1999; 49(443): 477–482.	203 (14)
26	O’Malley PG, Jackson JL, Santoro J, et al. Antidepressant therapy for unexplained symptoms and symptom syndromes. <i>J. Fam. Pract.</i> 1999; 48(12): 980–990.	199 (13)
27	King DE, Buchwick B. Beliefs and attitudes of hospital inpatients about faith healing and prayer. <i>J. Fam. Pract.</i> 1994; 39(4): 349–352.	198 (10)
28	Griffin SJ, Kinmonth AL, Veltman MW, et al. Effect on health-related outcomes of interventions to alter the interaction between patients and practitioners: a systematic review of trials. <i>Ann. Fam. Med.</i> 2004; 2(6): 595–608.	191 (19)

Rank	Articles	No. of Citations (Citation Density)
29	Dunn KM, Croft PR, Hackett GI. Sexual problems: a study of the prevalence and need for health care in the general population. <i>Fam. Pract.</i> 1998; 15(6): 519–524.	191 (12)
30	Deyo RA, Mirza SK, Turner JA, et al. Overtreating chronic back pain: time to back off? <i>J. Am. Board Fam. Med.</i> 2009; 22(1): 62–68.	190 (38)
31	Valderas JM, Starfield B, Sibbald B, et al. Defining comorbidity: implications for understanding health and health services. <i>Ann. Fam. Med.</i> 2009; 7(4): 357–363.	187 (37)
32	Levenstein JH, McCracken EC, McWhinney IR, et al. The patient-centered clinical method. 1. A model for the doctor-patient interaction in family medicine. <i>Fam. Pract.</i> 1986; 3(1): 24–30.	186 (7)
33	Thom DH, Campbell B. Patient-physician trust: an exploratory study. <i>J. Fam. Pract.</i> 1997; 44(2): 169–176.	184 (11)
34	Metsemakers JF, Höppener P, Knottnerus JA, et al. Computerized health information in The Netherlands: a registration network of family practices. <i>Br. J. Gen. Pract.</i> 1992; 42(356): 102–106.	183 (8)
35	Baker R. Development of a questionnaire to assess patients' satisfaction with consultations in general practice. <i>Br. J. Gen. Pract.</i> 1990; 40(341): 487–490.	182 (8)
36	Nutting PA, Miller WL, Crabtree BF, et al. Initial lessons from the first national demonstration project on practice transformation to a patient-centered Medical Home. <i>Ann. Fam. Med.</i> 2009; 7(3): 254–260.	181 (36)
37	Braithwaite D, Emery J, De Lusignan S, et al. Using the Internet to conduct surveys of health professionals: a valid alternative? <i>Fam. Pract.</i> 2003; 20(5): 545–551.	175 (16)
38	Fontaine KR, Cheskin LJ, Barofsky I. Health-related quality of life in obese persons seeking treatment. <i>J. Fam. Pract.</i> 1996; 43(3): 265–270.	169 (9)
39	Ornstein SM, Garr DR, Jenkins RG, et al. Computer-generated physician and patient reminders. Tools to improve population adherence to selected preventive services. <i>J. Fam. Pract.</i> 1991; 32(1): 82–90.	169 (7)
40	Ebell MH, Siwek J, Weiss BD, et al. Strength of recommendation taxonomy (SORT): a patient-centered approach to grading evidence in the medical literature. <i>Am. Fam. Physician</i> 2004; 69(3): 548–556.	165 (17)
41	Smith BH, Elliott AM, Chambers WA, et al. The impact of chronic pain in the community. <i>Fam. Pract.</i> 2001; 18(3): 292–299.	165 (13)
42	Golden MP, Vikram HR. Extrapulmonary tuberculosis: an overview. <i>Am. Fam. Physician</i> 2005; 72(9): 1761–1768.	163 (18)
43	Gadsby R, Barnie-adshead AM, Jagger C. A prospective study of nausea and vomiting during pregnancy. <i>Br. J. Gen. Pract.</i> 1993; 43(371): 245–248.	162 (8)
44	Katz DA, McHorney CA. The relationship between insomnia and health-related quality of life in patients with chronic illness. <i>J. Fam. Pract.</i> 2002; 51(3): 229–235.	159 (13)
45	Saultz JW, Lochner J. Interpersonal continuity of care and care outcomes: a critical review. <i>Ann. Fam. Med.</i> 2005; 3(2): 159–166.	156 (17)
46	Oeffinger KC, Mertens AC, Hudson MM, et al. Health care of young adult survivors of childhood cancer: a report from the Childhood Cancer Survivor Study. <i>Ann. Fam. Med.</i> 2004; 2(1): 61–70.	153 (15)
47	Livingston G, Blizard B, Mann A. Does sleep disturbance predict depression in elderly people? A study in inner London. <i>Br. J. Gen. Pract.</i> 1993; 43(376): 445–448.	151 (7)
48	Eakin EG, Glasgow RE, Riley KM. Review of primary care-based physical activity intervention studies: effectiveness and implications for practice and future research. <i>J. Fam. Pract.</i> 2000; 49(2): 158–168.	149 (11)
49	Williams S, Weinman J, Dale J. Doctor-patient communication and patient satisfaction: a review. <i>Fam. Pract.</i> 1998; 15(5): 480–492.	149 (9)
50	Fleming MF, Manwell LB, Barry KL, et al. Brief physician advice for alcohol problems in older adults: a randomized community-based trial. <i>J. Fam. Pract.</i> 1999; 48(5): 378–384.	148 (10)
51	Mainous AG 3rd, Hueston WJ, Clark JR. Antibiotics and upper respiratory infection: do some folks think there is a cure for the common cold? <i>J. Fam. Pract.</i> 1996; 42(4): 357–361.	148 (8)
52	Bertakis KD. The communication of information from physician to patient: a method for increasing patient retention and satisfaction. <i>J. Fam. Pract.</i> 1977; 5(2): 217–222.	148 (4)
53	Williams MV, Davis T, Parker RM, et al. The role of health literacy in patient-physician communication. <i>Fam. Med.</i> 2002; 34(5): 383–389.	146 (12)
54	Howie JG, Heaney DJ, Maxwell M, et al. A comparison of a Patient Enablement Instrument (PEI) against two established satisfaction scales as an outcome measure of primary care consultations. <i>Fam. Pract.</i> 1998; 15(2): 165–171.	146 (9)
55	Kiefer D, Pantuso T. Panax ginseng. <i>Am. Fam. Physician</i> 2003; 68(8): 1539–1542.	143 (13)
56	Anandarajah G, Hight E. Spirituality and medical practice: using the HOPE questions as a practical tool for spiritual assessment. <i>Am. Fam. Physician</i> 2001; 63(1): 81–89.	143 (11)
57	Ashenden R, Silagy C, Weller D. A systematic review of the effectiveness of promoting lifestyle change in general practice. <i>Fam. Pract.</i> 1997; 14(2): 160–176.	143 (8)
58	Assendelft WJ, Bouter LM, Knipschild PG. Complications of spinal manipulation: a comprehensive review of the literature. <i>J. Fam. Pract.</i> 1996; 42(5): 475–480.	143 (8)
59	Safran DG, Montgomery JE, Chang H, et al. Switching doctors: predictors of voluntary disenrollment from a primary physician's practice. <i>J. Fam. Pract.</i> 2001; 50(2): 130–136.	140 (11)

Rank	Articles	No. of Citations (Citation Density)
60	Borrell-Carrió F, Suchman AL, Epstein RM. The biopsychosocial model 25 years later: principles, practice, and scientific inquiry. <i>Ann. Fam. Med.</i> 2004; 2(6): 576–582.	138 (14)
61	Saultz JW, Albedaiwi W. Interpersonal continuity of care and patient satisfaction: a critical review. <i>Ann. Fam. Med.</i> 2004; 2(5): 445–451.	138 (14)
62	Creswell JW, Fetters MD, Ivankova NV. Designing a mixed methods study in primary care. <i>Ann. Fam. Med.</i> 2004; 2(1): 7–12.	138 (14)
63	Henbest RJ, Stewart M. Patient-centredness in the consultation. 2: does it really make a difference. <i>Fam. Pract.</i> 1990; 7(1): 28–33.	137 (6)
64	Leger L, Thivierge M. Heart rate monitors: validity, stability, and functionality. <i>Physician Sportsmed.</i> 1988; 16(5): 143–151.	137 (5)
65	Dowell SF, Schwartz B. Resistant pneumococci: protecting patients through judicious use of antibiotics. <i>Am. Fam. Physician</i> 1997; 55(5): 1647–1654, 1657–1658.	136 (8)
66	Viboud C, Boëlle PY, Cauchemez S, et al. Risk factors of influenza transmission in households. <i>Br. J. Gen. Pract.</i> 2004; 54(506): 684–689.	135 (14)
67	Grol R, Wensing M, Mainz J, et al. Patients' priorities with respect to general practice care: an international comparison. European Task Force on Patient Evaluations of General Practice (EUROPEP). <i>Fam. Pract.</i> 1999; 16(1): 4–11.	134 (9)
68	Oliphant CM, Green GM. Quinolones: a comprehensive review. <i>Am. Fam. Physician</i> 2002; 65(3): 455–464.	133 (11)
69	van der Windt DA, Koes BW, Boeke AJ, et al. Shoulder disorders in general practice: prognostic indicators of outcome. <i>Br. J. Gen. Pract.</i> 1996; 46(410): 519–523.	133 (7)
70	Williams S, Weinman J, Dale J, et al. Patient expectations: what do primary care patients want from the GP and how far does meeting expectations affect patient satisfaction? <i>Fam. Pract.</i> 1995; 12(2): 193–201.	133 (7)
71	Garraway WM, Russell EB, Lee RJ, et al. Impact of previously unrecognized benign prostatic hyperplasia on the daily activities of middle-aged and elderly men. <i>Br. J. Gen. Pract.</i> 1993; 43(373): 318–321.	133 (6)
72	Rosen LW, McKeag DB, Hough DO, et al. Pathogenic weight-control behavior in female athletes. <i>Physician Sportsmed.</i> 1986; 14(1): 79–83.	133 (5)
73	Walter FM, Emery J, Braithwaite D, et al. Lay understanding of familial risk of common chronic diseases: a systematic review and synthesis of qualitative research. <i>Ann. Fam. Med.</i> 2004; 2(6): 583–594.	132 (13)
74	Benowitz NL. Nicotine addiction. <i>Primary Care</i> 1999; 26(3): 611–631.	132 (9)
75	Cupp MJ. Herbal remedies: adverse effects and drug interactions. <i>Am. Fam. Physician</i> 1999; 59(5): 1239–1245.	130 (9)
76	Blanchard J, Lurie N. R-E-S-P-E-C-T: patient reports of disrespect in the health care setting and its impact on care. <i>J. Fam. Pract.</i> 2004; 53(9): 721–730.	129 (13)
77	Mainous AG 3rd, Baker R, Love MM, et al. Continuity of care and trust in one's physician: evidence from primary care in the United States and the United Kingdom. <i>Fam. Med.</i> 2001; 33(1): 22–27.	129 (10)
78	Waddell G, Feder G, Lewis M. Systematic reviews of bed rest and advice to stay active for acute low back pain. <i>Br. J. Gen. Pract.</i> 1997; 47(423): 647–652.	127 (7)
79	Lip GY, Golding DJ, Nazir M, et al. A survey of atrial fibrillation in general practice: the West Birmingham Atrial Fibrillation Project. <i>Br. J. Gen. Pract.</i> 1997; 47(418): 285–289.	127 (7)
80	Britten N, Jones R, Murphy E, et al. Qualitative research methods in general practice and primary care. <i>Fam. Pract.</i> 1995; 12(1): 104–114.	127 (7)
81	Sharp LK, Lipsky MS. Screening for depression across the lifespan: a review of measures for use in primary care settings. <i>Am. Fam. Physician</i> 2002; 66(6): 1001–1008.	126 (11)
82	Adler SR, Fosket JR. Disclosing complementary and alternative medicine use in the medical encounter: a qualitative study in women with breast cancer. <i>J. Fam. Pract.</i> 1999; 48(6): 453–458.	126 (8)
83	Templeton L, Deehan A, Taylor C, et al. Surveying general practitioners: does a low response rate matter? <i>Br. J. Gen. Pract.</i> 1997; 47(415): 91–94.	126 (7)
84	Malterud K. Shared understanding of the qualitative research process. Guidelines for the medical researcher. <i>Fam. Pract.</i> 1993; 10(2): 201–206.	126 (6)
85	Wisner CL, Gilmer TP, Saltzman LE, et al. Intimate partner violence against women: do victims cost wealth plans more? <i>J. Fam. Pract.</i> 1999; 48(6): 439–443.	125 (8)
86	Yardley L, Owen N, Nazareth I, et al. Prevalence and presentation of dizziness in a general practice community sample of working age people. <i>Br. J. Gen. Pract.</i> 1998; 48(429): 1131–1135.	125 (8)
87	Hobbs FD, Erhardt L. Acceptance of guideline recommendations and perceived implementation of coronary heart disease prevention among primary care physicians in five European countries: the Reassessing European Attitudes about Cardiovascular Treatment (REACT) survey. <i>Fam. Pract.</i> 2002; 19(6): 596–604.	124 (10)
88	Doukas DJ, McCullough LB. The values history. The evaluation of the patient's values and advance directives. <i>J. Fam. Pract.</i> 1991; 32(2): 145–153.	124 (5)

Rank	Articles	No. of Citations (Citation Density)
89	Williams SJ, Calnan M. Key determinants of consumer satisfaction with general practice. <i>Fam. Pract.</i> 1991; 8(3): 237–242.	123 (5)
90	Wilson S, Roberts L, Roalfe A, et al. Prevalence of irritable bowel syndrome: a community survey. <i>Br. J. Gen. Pract.</i> 2004; 54(504): 495–502.	122 (12)
91	Aikens JE, Nease DE, Nease DE Jr, et al. Adherence to maintenance-phase antidepressant medication as a function of patient beliefs about medication. <i>Ann. Fam. Med.</i> 2005; 3(1): 23–30.	120 (13)
92	Parchman ML, Culler S. Primary care physicians and avoidable hospitalizations. <i>J. Fam. Pract.</i> 1994; 39(2): 123–128.	120 (6)
93	Cantu RC. Guidelines for return to contact sports after a cerebral concussion. <i>Physician Sportsmed.</i> 1986; 14(10): 75–83.	120 (4)
94	Mair FS, Crowley TS, Bundred PE. Prevalence, aetiology and management of heart failure in general practice. <i>Br. J. Gen. Pract.</i> 1996; 46(403): 77–79.	119 (7)
95	Hamilton JG. Needle phobia: a neglected diagnosis. <i>J. Fam. Pract.</i> 1995; 41(2): 169–175.	119 (6)
96	Zung WW, Broadhead WE, Roth ME. Prevalence of depressive symptoms in primary care. <i>J. Fam. Pract.</i> 1993; 37(4): 337–344.	119 (6)
97	Bass MJ, Buck C, Turner L, et al. The physician's actions and the outcome of illness in family practice. <i>J. Fam. Pract.</i> 1986; 23(1): 43–47.	119 (4)
98	Miller WL, McDaniel RR Jr, Crabtree BF, et al. Practice jazz: understanding variation in family practices using complexity science. <i>J. Fam. Pract.</i> 2001; 50(10): 872–878.	118 (9)
99	Lynch T, Price A. The effect of cytochrome P450 metabolism on drug response, interactions, and adverse effects. <i>Am. Fam. Physician</i> 2007; 76(3): 391–396.	117 (17)
100	Fuller GF. Falls in the elderly. <i>Am. Fam. Physician.</i> 2000; 61(7): 2159–2168.	117 (8)

There were 10 countries that contributed to the top 100 list of the most cited articles in primary health care. The majority of the most cited papers came from the United States. It is not surprising that the United States led the ranking because it is at the top of the list for many other fields of medicine, such as anesthesiology,¹⁵ the respiratory system,⁷ general surgery,²¹ radiology,²⁰ and orthopedics.³² The results suggest that the United States has great influence on primary health care, which may be due to the large size of the primary health care community and sufficient financial support.^{5,19,36–38} In addition, there is a tendency for the authors from the United States to cite articles authored by researchers of the United States.^{5,39}

All of the articles in the top 100 list were written in English. The English language seems to be the most frequently used language for primary health care articles. Also, all of the 100 most cited articles were published in 9 journals. The top 3 journals for these publications were the *Journal of Family Practice*, *British Journal of General Practice*, and then *Family Practice*. It has been shown in some previous studies that the

impact factor of the journal was the strongest indicator for the number of citations, and most of the journals in which the articles were published had high impact factors.^{6,18} This, however, was not demonstrated in our study. Therefore, the impact factor of the journals in our study did not affect the citation numbers, which was similar to findings in other studies.²²

The authors Bertakis KD, Elwyn G, Mainous AG 3rd, Safran DG, Saultz JW, Smilkstein G, and Williams S have good publication records in primary health care and these authors have great priority in this field. The review articles were the most common type of article in the top 100 list. This finding was consistent with other medical specialties such as nursing research¹⁸ and integrative complementary medicine.²³ Commonly adopting reviews has occurred in other fields as well. Even though randomized controlled trials are thought to provide a high level of evidence, there were only a few in the top 100 list in our study. This may be due to randomized controlled trials requiring long period of treatment during the study and follow-up and also they are highly complex and require tight regulation.

TABLE 3. List of Top 100 Articles According to Source Journal

Journal	Number of Articles
<i>Journal of Family Practice</i>	33
<i>British Journal of General Practice</i>	17
<i>Family Practice</i>	16
<i>Annals of Family Medicine</i>	13
<i>American Family Physician</i>	10
<i>Family Medicine</i>	4
<i>Physician and Sportsmedicine</i>	4
<i>Journal of the American Board of Family Medicine</i>	2
<i>Primary Care</i>	1

TABLE 4. List of Top 100 Articles According to Country of Origin

Country	Number of Articles
United States	59
United Kingdom	25
Canada	5
The Netherlands	5
Australia	1
Denmark	1
France	1
Norway	1
Southern Africa	1
Spain	1

TABLE 5. List of Institutions of Origin for Articles That Had More Than One Top Cited Article

Institution	Number of Articles
University of Western Ontario	3
School of Medicine, Oregon Health & Science University	3
University of Washington, School of medicine	2
University of California, Davis	2
University of Birmingham	2
Weston Education Centre	2
University College London	2
Institute of Public Health, University of Cambridge	2
University of Edinburgh	2
Institute for Research in Extramural Medicine, Vrije Universiteit	2
Centre for Quality of Care Research, University of Nijmegen	2
Duke University Medical Center	2
Medical University of South Carolina	2
Michigan State University College of Human Medicine	2
New England Medical Center	2
University of Arizona College of Medicine	2
University of Michigan Medical School	2
University of Wisconsin	2

There were several limitations in the study. First, important and influential articles with fewer citations were not included. Second, our search was based on a category to access primary health care journals and the 18 journals did not include all articles published in the field of primary health care. Therefore, papers published in general medical journals were not evaluated.^{40–42} Our citation analysis did not evaluate self-citation, citations in textbooks and lectures, or web-based literature.^{26,32,43} Also, it is not possible for authors to cite papers from the journal in which they hope to publish their study.⁴⁴ Fourth, older articles were favored because the overall number of citations accumulated over a longer period of time. Fifth, the

TABLE 6. List of Type of Article for the Top 100 Articles

Type of Article	Number of Articles
Review	31
Qualitative Study	27
Methodological Study	14
Cross-Sectional Study	6
Epidemiology	6
Randomized Controlled Trial	4
Validation	3
Guideline	2
Cohort study	1
Discussion	1
Expert Opinion	1
Others	4

scientific community has a tendency to comply with a paradigm and therefore there is a “snowball effect.”⁴⁵ This means that authors may cite certain articles more often simply because they have received numerous citations previously, rather than citing the article for its value. Finally, this study was a cross-sectional study that was performed at a single time point. Results could change if the analysis is performed at another time point.^{41,42}

CONCLUSIONS

Our study produced a detailed list of the 100 most cited articles in primary health care and this list was analyzed. The top cited papers were published in English and were most review and qualitative types of studies. The top journal was the *Journal of Family Practice*, which originates from the United States. Our study may provide information for future analyses to determine the necessary characteristics of classic articles in the field. Our top 100 list of articles provides insight into the history and development of primary health care as a medical specialty and may be the basis for future studies.

ACKNOWLEDGMENT

We thank Dr. Zhiwei Jia for his help in this study.

REFERENCES

- World Health Organization. Primary health care. www.wpro.who.int/topics/primary_health_care/en/. Accessed November 24, 2015.
- Cheek J, Garnham B, Quan J. What’s in a number? Issues in providing evidence of impact and quality of research(ers). *Qual Health Res.* 2006;16:423–435.
- Garfield E. Citation analysis as a tool in journal evaluation. *Science.* 1972;178:471–479.
- Gisvold SE. Citation analysis and journal impact factors—is the tail wagging the dog? *Acta Anaesthesiol Scand.* 1999;43:971–973.
- Kelly JC, Glynn RW, O’Brian DE, et al. The 100 classic papers of orthopaedic surgery: a bibliometric analysis. *J Bone Joint Surg Br.* 2010;92:1338–1343.
- To P, Atkinson CT, Lee DH, et al. The most cited articles in hand surgery over the past 20-plus years: a modern-day reading list. *J Hand Surg Am.* 2013;38:983–987.
- Tam WW, Wong EL, Wong FC, et al. Citation classics: top 50 cited articles in ‘respiratory system’. *Respirology.* 2013;18:71–81.
- Tas F. An analysis of the most-cited research papers on oncology: which journals have they been published in? *Tumour Biol.* 2014;35:4645–4649.
- Tsai YL, Lee CC, Chen SC, et al. Top-cited articles in emergency medicine. *Am J Emerg Med.* 2006;24:647–654.
- Baltussen A, Kindler CH. Citation classics in critical care medicine. *Respirology.* 2004;30:902–910.
- Shadgan B, Roig M, Hajghanbari B, et al. Top-cited articles in rehabilitation. *Arch Phys Med Rehabil.* 2010;91:806–815.
- Coelho DH, Edelmayer LW, Fenton JE. A century of citation classics in otolaryngology-head and neck surgery journals revisited. *Laryngoscope.* 2014;124:1358–1362.
- Brandt JS, Downing AC, Howard DL, et al. Citation classics in obstetrics and gynecology: the 100 most frequently cited journal articles in the last 50 years. *Am J Obstet Gynecol.* 2010;203:355.e351–355.e357.
- Ohba N, Nakao K, Isashiki Y, et al. The 100 most frequently cited articles in ophthalmology journals. *Arch Ophthalmol.* 2007;125:952–960.

15. Baltussen A, Kindler CH. Citation classics in anesthetic journals. *Anesth Analg*. 2004;98:443–451.
16. Stern RS, Arndt KA. Top-cited dermatology authors publishing in 5 “high-impact” general medical journals. *Arch Dermatol*. 2000;136:357–361.
17. Wong EL, Tam WW, Wong FC, et al. Citation classics in nursing journals: the top 50 most frequently cited articles from 1956 to 2011. *Nurs Res*. 2013;62:344–351.
18. Ollerton JE, Sugrue M. Citation classics in trauma. *J Trauma*. 2005;58:364–369.
19. Nason GJ, Tareen F, Mortell A. The top 100 cited articles in urology: an update. *Can Urol Assoc J*. 2013;7:E16–E24.
20. Pagni M, Khan NR, Cohen HL, et al. Highly cited works in radiology: the top 100 cited articles in radiologic journals. *Acad Radiol*. 2014;21:1056–1066.
21. Paladugu R, Schein M, Gardezi S, et al. One hundred citation classics in general surgical journals. *World J Surg*. 2002;26:1099–1105.
22. Ponce FA, Lozano AM. Highly cited works in neurosurgery. Part I: the 100 top-cited papers in neurosurgical journals. *J Neurosurg*. 2010;112:223–232.
23. Tam WWS, Wong ELY, Wong FCY, et al. Citation classics in the integrative and complementary medicine literature: 50 frequently cited articles. *Eur J Integr Med*. 2012;4:e77–e83.
24. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med*. 2009;6:e1000100.
25. Murray MR, Wang T, Schroeder GD, et al. The 100 most cited spine articles. *Eur Spine J*. 2012;21:2059–2069.
26. Namdari S, Baldwin K, Kovatch K, et al. Fifty most cited articles in orthopedic shoulder surgery. *J Shoulder Elbow Surg*. 2012;21:1796–1802.
27. Kavanagh RG, Kelly JC, Kelly PM, et al. The 100 classic papers of pediatric orthopaedic surgery: a bibliometric analysis. *J Bone Joint Surg Am*. 2013;95:e134.
28. Viera AJ, Garrett JM. Understanding interobserver agreement: the kappa statistic. *Fam Med*. 2005;37:360–363.
29. Stewart M, Brown JB, Donner A, et al. The impact of patient-centered care on outcomes. *J Fam Pract*. 2000;49:796–804.
30. Rubak S, Sandboek A, Lauritzen T, et al. Motivational interviewing: a systematic review and meta-analysis. *Br J Gen Pract*. 2005;55:305–312.
31. Britten N, Jones R, Murphy E, et al. Qualitative research methods in general-practice and primary care. *Fam Pract*. 1995;12:104–114.
32. Lefavre KA, Shadgan B, O'Brien PJ. 100 most cited articles in orthopaedic surgery. *Clin Orthop Relat Res*. 2011;469:1487–1497.
33. Yoon DY, Yun EJ, Ku YJ, et al. Citation classics in radiology journals: the 100 top-cited articles. *AJR Am J Roentgenol*. 2013;201:471–481.
34. Bayley M, Brooks F, Tong A, et al. The 100 most cited papers in foot and ankle surgery. *Foot (Edinb)*. 2014;24:11–16.
35. Oh YS, Galis ZS. Anatomy of success: the top 100 cited scientific reports focused on hypertension research. *Hypertension*. 2014;63:641–647.
36. Liang Z, Luo X, Gong F, et al. Worldwide research productivity in the field of arthroscopy: a bibliometric analysis. *Arthroscopy*. 2015;31:1452–1457.
37. Ding F, Jia Z, Liu M. National representation in the spine literature: a bibliometric analysis of highly cited spine journals. *Eur Spine J*. 2015 Aug 30 [Epub ahead of print].
38. Luo X, Liang Z, Gong F, et al. Worldwide productivity in the field of foot and ankle research from 2009–2013 a bibliometric analysis of highly cited journals. *J Foot Ankle Res*. 2015;8:12.
39. Campbell FM. National bias: a comparison of citation practices by health professionals. *Bull Med Libr Assoc*. 1990;78:376–382.
40. Jia ZW, Wu YH, Li H, et al. Growing trend of China's contribution to the field of spine: a 10-year survey of the literature. *Eur Spine J*. 2015;24:1806–1812.
41. Jia Z, Ding F, Wu H, et al. The 50 most-cited articles in orthopaedic surgery from Mainland China. *Clin Orthop Relat Res*. 2015;473:2423–2430.
42. Huo YQ, Pan XH, Li QB, et al. Fifty top-cited classic papers in orthopedic elbow surgery: a bibliometric analysis. *Int J Surg*. 2015;18:28–33.
43. Dumont JE. The bias of citations. *Trends Biochem Sci*. 1989;14:327–328.
44. Seglen PO. Why the impact factor of journals should not be used for evaluating research. *BMJ*. 1997;314:498–502.
45. Kuhn TS. Historical structure of scientific discovery. *Science*. 1962;136:760–764.