A Bibliometric Analysis of the Top-Cited Articles on Diabetic Foot Ulcers

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Abstract
The aim of this study was to determine the top-cited articles in the field of diabetic foot ulcer (DFU) research. A cross-sectional bibliometric analysis was conducted in January 2021 by using Boolean search terms in the Scopus and the Web of Science databases. The 50 top-cited articles that met the inclusion criteria were ranked and evaluated for several characteristics, including year of publication, country of origin, authorship, publishing journal, topic categories, publishing type, and level of evidence. The median number of citations per article in the list was 442 (interquartile range [IQR], 320-520), with a median of 21.8 citations (IQR, 16.5-34.5) per year since publication. The publication years ranged from 1986 to 2017, with 1998 accounting for the greatest number of studies (n = 7). The citation classics were published in 20 journals and originated from institutions in 9 countries. The majority of the studies were clinical, of which expert opinion/review with Level V evidence and clinical studies with Levels I and II evidence comprised the greater proportion in the list. This study provides useful insights into the history and development of DFU research. The top-cited list may serve as a quick reference for education curriculums and clinical practice, in addition to providing a foundation for further studies on this topic.

Keywords
diabetic foot ulcers, lower extremity wound, bibliometric, citation, analysis, top-cited articles

Introduction
Diabetic foot ulcer (DFU) is a common and much-feared complication of diabetes. Currently, there are 463 million adults living with diabetes worldwide, and ~6.3% of them may suffer from foot ulcers.1 At the initial presentation, more than half of DFUs are clinically infected, leading to substantial morbidity, a significantly impaired quality of life, and prolonged hospitalization, and preceding 80% of all nontraumatic lower-extremity amputations.2,3 The health care expenditures associated with the management of DFUs are also considerably high, consuming about one-third of the total cost of diabetic care.4 Abundant studies have been conducted and published over the past decades given the serious consequence and huge burden of DFUs on patients, their families, and society. However, such a rapid growth of the DFU literature would be challenging not only with regard to acquainting novice researchers with the most salient topics, but also concerning the thorough identification of this field to guide future studies.

Citation analysis is a quantitative bibliometric method for appraising the impact of academic publications in a particular discipline. Although the number of citations is not the only surrogate for determining the quality of scholarly works, it provides valuable data to determine classics that have shaped medical practice, fostered new research ideas, and predicted emerging trends and hotspots.5-7 Several citation analyses have been conducted regarding various medical specialties and subspecialties, including diabetes8-10 and podiatric medicine.11-13 While studies on the diabetic foot comprise over a quarter of the top-cited publications in the field of foot and ankle surgery,12 only a single bibliometric review has specifically addressed DFU to date.14 However, that citation analysis was limited to few articles retrieved within a short time span from 2007 to 2018, which would be insufficient to reflect the evolution of the DFU research.14 Therefore, we performed the current study to compile a comprehensive list of the most cited works that have

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made key contributions to DFU over the past several decades. With this information, we intend to provide a historical perspective of scientific progress, determine the status quo of research, and highlight future trends in the field of DFU.

**Materials and Methods**

Institutional review board approval was not required given the publicly available nature of the data without protected health information. In January 2021, a search of the Scopus (www.scopus.com) and the Web of Science (www.webofknowledge.com) databases was conducted as described in previous studies.\(^{15-17}\) To yield the broadest results, articles were queried in each database by using the following Boolean search phrase: (“diabet* foot” OR [infection AND foot AND “diabetes mellitus”] OR [osteomyelitis AND foot AND “diabetes mellitus”] OR [“foot ulcer*” AND “diabetes mellitus”]). No restrictions were placed in terms of language, publication date, or journal. All publications were organized in descending order according to the number of citations. The 2 authors independently evaluated each manuscript to determine whether the contents were dedicated to the diagnosis, therapy, prognosis, or economic analysis of DFU. Since infection and osteomyelitis are progressive and deteriorative conditions associated with DFU, relevant studies on diabetic foot infection and diabetic foot osteomyelitis were also enrolled. Articles were excluded if their primary focus was not DFU, even if the topic was peripherally discussed. Furthermore, publications such as editorials, letters to the editor, commentaries, and meeting abstracts were excluded. This process was repeated until the 50 most-cited articles on DFU were retrieved, and any discrepancies between authors were resolved by consensus. The methodology is illustrated as a flowchart in Figure 1.

The following details were recorded for each of the top-cited articles that met the inclusion criteria: authorship, year of publication, publishing journal, country and institution of origin, study design (randomized controlled trial, cohort study, case–control study, case series, case report, etc.).

![Figure 1. Study flow diagram.](image-url)
systematic review, expert opinion/review, or basic science), and research area. The country of the affiliation was identified based on the geographic location of the corresponding author. If the contact author had 2 or more affiliations from different countries, the first 1 was recorded. The research areas were sorted according to the Web of Science categories/classification. The level of evidence for clinical studies was assigned on a scale of I to V based on the Journal of Bone & Joint Surgery-American Volume guidelines. Specifically, the level of evidence for systematic reviews was determined by that of the literature analyzed, whereas review articles in a nonsystematic fashion were coded into the expert-opinion category. Citation density, defined as the number of citations per year, was also extracted for the identified articles.

Results

The initial search yielded 28,049 and 23,594 preliminary results in Scopus and Web of Science, respectively. Table 1 provides a list of the top-cited articles in descending order according to the number of citations in Scopus. This list actually consisted of 56 articles because 6 unique articles were retrieved from each database.

The top 3 articles were each cited more than 1000 times, and the median number of citations per article in the list was 442 (interquartile range [IQR], 320-520). The citation density spanned from 181.3 to 12.6, with a median of 21.8 citations per year since publication (IQR, 16.5-34.5). The publication years ranged from 1986 to 2017, and the greatest number of studies were published in 1998 (n = 7). Twenty journals were represented by the citation classics, with Diabetes Care having the highest number of publications (n = 24; Table 2). Accordingly, the majority of the top-cited articles were published in specialty periodicals, and Endocrinology/Metabolism was the most popular Web of Science research category with 33 studies. There were 10 articles published in the nonspecialty journals with the highest impact factors, including Lancet, JAMA, and New England Journal of Medicine.

Although all the studies were published in the English language, there was some diversity in terms of the country of origin. More than half of the articles originated from the United States (n = 35), followed by the United Kingdom (n = 11), the Netherlands (n = 3), and Sweden (n = 2). China, Germany, Italy, Korea, and Portugal each contributed 1 article to the list. The University of Washington Veterans Affairs Puget Sound Healthcare System was the most prolific institution for the topic of interest with 8 studies, whereas the Manchester Royal Infirmary/University of Manchester produced 6 articles and was the most prominent institution from outside the United States.

Regarding the corresponding authors, 12 researchers authored 2 or more of the top-cited articles. Professor Andrew J M Boulton was the most productive contact author with 5 publications, followed by David G Armstrong and Aristidis Veves, who were the corresponding authors in 4 and 3 articles, respectively. The authorships also included 9 committees and panels, of which the Infectious Diseases Society of America, the American Diabetes Association, and the Diabetic Ulcer Study Group each developed 2 articles.

The majority of the studies were clinical, with 6 papers representing some type of basic science research. Among the top clinical articles, expert-opinion/review publications (n = 15), cohort studies (n = 14), and randomized controlled trials (n = 12) were the most prevalent study design (Table 3). Accordingly, the most common level of evidence was V. Second to this were Levels I and II, with 13 studies each falling into the categories (Figure 2).

Discussion

In this study, we queried the Scopus and Web of Science databases to rank the top-cited articles with respect to DFU research. Most of the articles were published in specialty journals and originated from academic institutions in the United States. Expert opinion/review with Level V evidence and clinical studies with Levels I and II evidence comprised a majority of the publications in the list.

Currently, several public and commercial databases are available for citation analysis, but none is considered superior. Web of Science was the first of its kind and is the most commonly used bibliometric resource, while Scopus covers more expanded scientific fields and focuses on contemporary publications. Therefore, both databases were queried in this study to ensure comprehensive article coverage. We found that the number of citations per article returned by Scopus was generally greater than that returned by Web of Science, and each contained unique citation classics in the list. A previous analysis also revealed that 80% of the top-cited articles dedicated to obstetrics and gynecology were acquired from both resources. This observation can be explained by the different contents covered and documents cited between the 2 databases. It has been proposed that Scopus indexes a wider journal range than Web of Science and retrieves a greater proportion of citations from non-English language sources.

The first 3 articles in this list, each passing the 1000-citation mark, were comprehensive reviews published in nonspecialty journals, whereas a total of 6 consensus statements by different expert committees were released in specialty ones. Our findings may imply that nonspecialty periodicals have a broader readership and a greater potential to be cited, while specialty ones cater to the specialized needs of audiences within the field. We also found a diversity of Web of Science categories for these specialty periodicals, including Endocrinology/Metabolism, Infectious Diseases/Microbiology, Orthopedics, and Peripheral Vascular
Table 1. Top 50 Cited Articles on Diabetic Foot Ulcers According to the Number of Citations in Scopus.

| Citations, Scopus, n (citation density)* | Citations, Web of Science, n (citation density)* | Authors | Title | Journal | Year | Study type |
|----------------------------------------|-------------------------------------------------|---------|-------|---------|------|------------|
| 1661 (110.7)                           | 1510 (100.7)                                    | Singh et al<sup>2</sup> | Preventing foot ulcers in patients with diabetes | *JAMA* | 2005 | Systematic review |
| 1297 (86.5)                            | 1208 (80.5)                                     | Boulton et al<sup>20</sup> | The global burden of diabetic foot disease | *Lancet* | 2005 | Expert opinion/ review |
| 1207 (80.5)                            | 1171 (78.1)                                     | Falanga<sup>21</sup> | Wound healing and its impairment in the diabetic foot | *Lancet* | 2005 | Basic science study |
| 795 (99.4)                             | 762 (95.3)                                      | Lipsky et al<sup>19</sup> | 2012 Infectious Diseases Society of America clinical practice guideline for the diagnosis and treatment of diabetic foot infections | *Clin Infect Dis* | 2012 | Expert opinion/ review |
| 782 (37.2)                             | 685 (62.3)                                      | Ramsey et al<sup>22</sup> | Incidence, outcomes, and cost of foot ulcers in patients with diabetes | *Diabetes Care* | 1999 | Cohort study |
| 758 (47.4)                             | 637 (39.8)                                      | Lipsky et al<sup>23</sup> | Diagnosis and treatment of diabetic foot infections | *Clin Infect Dis* | 2004 | Expert opinion/ review |
| 720 (34.3)                             | 628 (29.9)                                      | Reiber et al<sup>24</sup> | Causal pathways for incident lower extremity ulcers in patients with diabetes from 2 settings | *Diabetes Care* | 1999 | Case series |
| 694 (31.5)                             | 600 (27.3)                                      | Armstrong et al<sup>25</sup> | Validation of a diabetic wound classification system. The contribution of depth, infection, and ischemia to risk of amputation | *Diabetes Care* | 1998 | Case series |
| 660 (36.7)                             | 553 (30.7)                                      | Abbott et al<sup>26</sup> | The North-West Diabetes Foot Care Study: incidence of, and risk factors for, new diabetic foot ulceration in a community-based patient cohort | *Diabet Med* | 2002 | Cohort study |
| 655 (43.7)                             | 576 (38.4)                                      | Armstrong and Lavery<sup>27</sup> | Negative pressure wound therapy after partial diabetic foot amputation: a multicentre, randomized controlled trial | *Lancet* | 2005 | Randomized controlled trial |
| 588 (34.6)                             | 546 (32.1)                                      | Jeffcoate and Harding<sup>28</sup> | Diabetic foot ulcers | *Lancet* | 2003 | Expert opinion/ review |
| 561 (21.6)                             | 419 (16.1)                                      | Caputo et al<sup>29</sup> | Assessment and management of foot disease in patients with diabetes | *N Engl J Med* | 1994 | Expert opinion/ review |
| 544 (181.3)                            | 524 (174.7)                                     | Armstrong et al<sup>3</sup> | Diabetic foot ulcers and their recurrence | *N Engl J Med* | 2017 | Expert opinion/ review |
| 520 (27.4)                             | 487 (25.6)                                      | Veves et al<sup>30</sup> | Graftskin, a human skin equivalent, is effective in the management of noninfected neuropathic diabetic foot ulcers: a prospective randomized multicenter clinical trial | *Diabetes Care* | 2001 | Randomized controlled trial |
| 518 (15.2)                             | 369 (10.9)                                      | Edmonds et al<sup>31</sup> | Improved survival of the diabetic foot: the role of a specialized foot clinic | *Q J Med* | 1986 | Case series |
| 511 (23.2)                             | 433 (16.7)                                      | Wieman et al<sup>32</sup> | Efficacy and safety of a topical gel formulation of recombinant human platelet-derived growth factor-BB (becaplermin) in patients with chronic neuropathic diabetic ulcers. A phase III randomized placebo-controlled double-blind study | *Diabetes Care* | 1998 | Randomized controlled trial |
| 511 (18.3)                             | 417 (14.9)                                      | Veves et al<sup>33</sup> | The risk of foot ulceration in diabetic patients with high foot pressure: a prospective study | *Diabetologia* | 1992 | Cohort study |

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| Citations, Scopus, n (citation density*) | Citations, Web of Science, n (citation density*) | Authors | Title | Journal | Year | Study type |
|----------------------------------------|-----------------------------------------------|---------|-------|---------|------|------------|
| 497 (19.1)                             | 421 (16.2)                                   | Young et al | The prediction of diabetic neuropathic foot ulceration using vibration perception thresholds. A prospective study | Diabetes Care | 1994 | Cohort study |
| 492 (41.0)                             | 427 (35.6)                                   | Boulton et al | Comprehensive foot examination and risk assessment: a report of the task force of the foot care interest group of the American Diabetes Association, with endorsement by the American Association of Clinical Endocrinologists | Diabetes Care | 2008 | Expert opinion/review |
| 483 (20.1)                             | 401 (16.7)                                   | Steed et al | Effect of extensive debridement and treatment on the healing of diabetic foot ulcers | J Am Coll Surg | 1996 | Randomized controlled trial |
| 481 (40.1)                             | 455 (37.9)                                   | Prompers et al | Prediction of outcome in individuals with diabetic foot ulcers: focus on the differences between individuals with and without peripheral arterial disease. The Eurodiale study | Diabetologia | 2008 | Cohort study |
| 475 (33.9)                             | 337 (24.1)                                   | Frykberg et al | Diabetic foot disorders. A clinical practice guideline (2006 revision) | J Foot Ankle Surg | 2006 | Expert opinion/review |
| 473 (18.9)                             | 403 (16.1)                                   | Steed | Clinical evaluation of recombinant human platelet-derived growth factor for the treatment of lower extremity diabetic ulcers | J Vasc Surg | 1995 | Randomized controlled trial |
| 466 (27.4)                             | 430 (25.3)                                   | Marston et al | The efficacy and safety of Dermagraft in improving the healing of chronic diabetic foot ulcers: results of a prospective randomized trial | Diabetes Care | 2003 | Randomized controlled trial |
| 464 (22.1)                             | 363 (17.3)                                   | Boyko et al | A prospective study of risk factors for diabetic foot ulcer. The Seattle Diabetic Foot Study | Diabetes Care | 1999 | Cohort study |
| 460 (18.4)                             | 339 (13.6)                                   | Grayson et al | Probing to bone in infected pedal ulcers. A clinical sign of underlying osteomyelitis in diabetic patients | JAMA | 1995 | Cohort study |
| 458 (35.2)                             | 411 (31.6)                                   | Prompers et al | High prevalence of ischemia, infection and serious comorbidity in patients with diabetic foot disease in Europe. Baseline results from the Eurodiale study | Diabetologia | 2007 | Cohort study |
| 442 (22.1)                             | 382 (19.1)                                   | Pham et al | Screening techniques to identify people at high risk for diabetic foot ulceration: a prospective multicenter trial | Diabetes Care | 2000 | Cohort study |
| 442 (21.0)                             | 124 (5.9)                                    | American Diabetes Association | Consensus Development Conference on Diabetic Foot Wound Care: 7-8 April 1999, Boston, Massachusetts. American Diabetes Association | Diabetes Care | 1999 | Expert opinion/review |
| 406 (21.4)                             | 329 (17.3)                                   | Armstrong et al | Off-loading the diabetic foot wound: a randomized clinical trial | Diabetes Care | 2001 | Randomized controlled trial |
| 383 (27.4)                             | 363 (25.9)                                   | Lavery et al | Risk factors for foot infections in individuals with diabetes | Diabetes Care | 2006 | Cohort study |
| 360 (30.0)                             | 347 (28.9)                                   | Choi et al | In vivo wound healing of diabetic ulcers using electrospun nanofibers immobilized with human epidermal growth factor (EGF) | Biomaterials | 2008 | Basic science study |

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| Citations, Scopus, n (citation density*) | Citations, Web of Science, n (citation density*) | Authors | Title | Journal | Year | Study type |
|----------------------------------------|-----------------------------------------------|---------|-------|---------|------|------------|
| 360 (20.0) | 334 (18.6) | Lobmann et al | Expression of matrix-metalloproteinases and their inhibitors in the wounds of diabetic and nondiabetic patients | Diabetologia | 2002 | Basic science study |
| 352 (20.7) | 311 (18.3) | Moulik et al | Amputation and mortality in new-onset diabetic foot ulcers stratified by etiology | Diabetes Care | 2003 | Case series |
| 352 (16.0) | 266 (12.1) | Reiber et al | The burden of diabetic foot ulcers | Am J Surg | 1998 | Expert opinion/review |
| 341 (12.6) | 287 (10.6) | Apelqvist et al | Long-term prognosis for diabetic patients with foot ulcers | J Intern Med | 1993 | Cohort study |
| 340 (17.9) | 299 (15.7) | Oyibo et al | A comparison of 2 diabetic foot ulcer classification systems: the Wagner and the University of Texas wound classification systems | Diabetes Care | 2001 | Case–control study |
| 334 (19.6) | 330 (19.4) | Sheehan et al | Percent change in wound area of diabetic foot ulcers over a 4-week period is a robust predictor of complete healing in a 12-week prospective trial | Diabetes Care | 2003 | Cohort study |
| 329 (13.2) | 265 (10.6) | McNeely et al | The independent contributions of diabetic neuropathy and vasculopathy in foot ulceration. How great are the risks? | Diabetes Care | 1995 | Case–control study |
| 326 (13.6) | 272 (11.3) | Gentzkow et al | Use of Dermagraft, a cultured human dermis, to treat diabetic foot ulcers | Diabetes Care | 1996 | Randomized controlled trial |
| 322 (21.5) | 284 (18.9) | Cavanagh et al | Treatment for diabetic foot ulcers | Lancet | 2005 | Expert opinion/review |
| 322 (15.3) | 285 (13.6) | Sniell et al | Efficacy and safety of becaplermin (recombinant human platelet-derived growth factor-BB) in patients with nonhealing, lower extremity diabetic ulcers: a combined analysis of 4 randomized studies | Wound Repair Regen | 1999 | Randomized controlled trial |
| 319 (14.5) | 251 (11.4) | Lavery et al | Practical criteria for screening patients at high risk for diabetic foot ulceration | Arch Intern Med | 1998 | Case–control study |
| 318 (26.5) | 325 (27.1) | Dowd et al | Polymicrobial nature of chronic diabetic foot ulcer biofilm infections determined using bacterial tag-encoded FLX amplicon pyrosequencing (bTEFAP) | Plos One | 2008 | Basic science study |
| 316 (14.4) | 239 (10.9) | Frykberg et al | Role of neuropathy and high foot pressures in diabetic foot ulceration | Diabetes Care | 1998 | Cohort study |
| 315 (22.5) | 326 (23.3) | Blakney and Jude | The molecular biology of chronic wounds and delayed healing in diabetes | Diabet Med | 2006 | Basic science study |
| 311 (14.1) | 256 (11.6) | Abbott et al | Multicenter study of the incidence of and predictive risk factors for diabetic neuropathic foot ulceration | Diabetes Care | 1998 | Cohort study |
| 310 (12.9) | 246 (10.3) | Faglia et al | Adjunctive systemic hyperbaric oxygen therapy in treatment of severe prevalently ischemic diabetic foot ulcer. A randomized study | Diabetes Care | 1996 | Randomized controlled trial |
| 309 (14.0) | 263 (12.0) | Mayfield et al | Preventive foot care in people with diabetes | Diabetes Care | 1998 | Expert opinion/review |
| 307 (43.9) | 311 (44.4) | Moura et al | Recent advances in the development of wound dressings for diabetic foot ulcer treatment—a review | Acta Biomater | 2013 | Basic science study |

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Disease. This multidisciplinary nature of publishing journals is in accordance with the modern algorithm for the management of DFU. The deployment of diabetic foot teams has been widely advocated to improve outcomes and processes in patient care.19 Since these teams are composed of professionals in a variety of disciplines, each member may focus on and preferentially obtain citations from a few reputable journals in their respective fields of expertise.10,76

Although 79% of adults with diabetes live in developing countries, academic institutions in developed countries have exerted overwhelming influence on diabetes-related research.8,10 Our geographic analysis, consistent with previous studies of endocrinology and metabolism topics,77,78 demonstrated that the United States was the most prolific country by a significant margin with respect to citation classics. A plausible reason for this dominance may be the large size of the US scientific community (eg, the American Diabetes Association), its abundant research budget and output, and a tendency for American authors to cite material from their own country.79 Interestingly, we also observed that 9 consortiums contributed to 12 top-cited articles in the list, including 6 clinical practice guidelines, 5 randomized controlled trials, and 1 prospective community-based cohort study. Owing to the interdisciplinary and miscellaneous approaches in the management of DFU, international and regional collaboration is efficient for conducting high-quality research with a large population, in addition to providing robust conclusions and recommendations. It is generally believed that these well-designed studies and the latest consensus documents could become heavily cited in the literature.

Preclinical research provides insights into pathophysiological mechanisms and allows the rigorous evaluation of pilot studies in experimental models, which is important for expanding knowledge about a disease. Prior bibliometric analyses revealed a substantial contribution of basic science works in top lists, accounting for 24% to 42% of citation classics in diabetes,10 osteoporosis,80 and orthopedic surgery.81,82 In contrast, there were only 6 nonclinical articles in our investigation, including 3 exhaustive reviews on the molecular biology of DFU healing and recent advances in wound dressing, in addition to 2 in vitro and 1 in vivo study. The explanation for this observation is unknown, but it is probably attributed to the specific locations of the different types of studies. Nolan et al76 identified 659 different journals that had published at least 1 relevant report pertaining to diabetic foot disease in 2012, and found that 17.3% of them were classified into the “basic science/research” category for specialty or primary readership. The value would fall to 3.85% if journals with at least 10

Table 1. (continued)

| Citations, Scopus, n (citation density) | Citations, Web of Science, n (citation density) | Authors | Title | Journal | Year | Study type |
|---------------------------------------|-----------------------------------------------|---------|-------|---------|------|------------|
| 306 (15.3)                            | 264 (13.2)                                    | Apelqvist and Larsson67 | What is the most effective way to reduce incidence of amputation in the diabetic foot? | Diabetes Metab Res Rev | 2000 | Expert opinion/review |
| 298 (14.2)                            | 272 (13.0)                                    | Margolis et al68 | Healing of diabetic neuropathic foot ulcers receiving standard treatment. A meta-analysis | Diabetes Care | 1999 | Systematic review |
| 283 (31.4)                            | 279 (31.0)                                    | Lu et al69 | Comparison of bone marrow mesenchymal stem cells with bone marrow-derived mononuclear cells for treatment of diabetic critical limb ischemia and foot ulcer: a double-blind, randomized, controlled trial | Diabetes Res Clin Pract | 2011 | Randomized controlled trial |
| 263 (32.9)                            | 269 (33.6)                                    | Bakker et al70 | Practical guidelines on the management and prevention of the diabetic foot 2011 | Diabetes Metab Res Rev | 2012 | Expert opinion/review |
| 254 (15.9)                            | 331 (20.7)                                    | Boulton et al71 | Neuropathic diabetic foot ulcers | N Engl J Med | 2004 | Expert opinion/review |
| 231 (19.2)                            | 347 (28.9)                                    | Blume et al72 | Comparison of negative pressure wound therapy using vacuum-assisted closure with advanced moist wound therapy in the treatment of diabetic foot ulcers: a multicenter randomized controlled trial | Diabetes Care | 2008 | Randomized controlled trial |

*The number of citations per year.
relevant articles were enrolled. This published volume discordance between clinical and nonclinical articles highlights the potential requirements for much development of basic science research in future.

**Limitations**

This citation analysis has inherent limitations that require consideration. Similar to previously described methods, the first and possibly the most significant is that we were unable to account for self-citations, citations in textbooks and lectures, and authors’ predilection to cite articles from journals where they sought to publish. The second weakness is related to 2 biases in citation practice, namely “obliteration by incorporation phenomenon” and the “snowball effect.” The main idea behind the former is that classic papers are gradually being cited less as their substances become integrated into current knowledge, and the latter indicates a tendency to cite articles because of an abundance of previous citations. Third, a query for 50 articles, as within any other number, is arbitrary and may exclude other influential works from the list. However, some authors believed that 50 represent a reasonable number of articles to offer a framework for physicians, researchers, and trainees in a specific subject area. Finally, this cross-sectional study acquired the count profiles at a time point, and the most recent articles

**Table 2. Journal of Origin.**

| Journal                                      | Web of Science categories/classification | Number of articles |
|----------------------------------------------|------------------------------------------|--------------------|
| Diabetes Care                                | Endocrinology & Metabolism                | 24                 |
| Lancet                                       | General & Internal Medicine               | 5                  |
| Diabetologia                                 | Endocrinology & Metabolism                | 4                  |
| The New England Journal of Medicine          | General & Internal Medicine               | 3                  |
| Clinical Infectious Diseases                 | Immunology; Infectious Diseases; Microbiology | 2                  |
| Diabetes/Metabolism Research and Reviews     | Endocrinology & Metabolism                | 2                  |
| Diabetic Medicine                            | Endocrinology & Metabolism                | 2                  |
| JAMA-Journal of the American Medical Association | General & Internal Medicine             | 2                  |
| Wound Repair and Regeneration                | Cell Biology; Dermatology; Research & Experimental Medicine; Surgery | 1                  |
| Diabetes Research and Clinical Practice      | Endocrinology & Metabolism                | 1                  |
| Acta Biomaterialia                           | Engineering; Materials Science            | 1                  |
| Biomaterials                                 | Engineering; Materials Science            | 1                  |
| Archives of Internal Medicine                | General & Internal Medicine               | 1                  |
| Journal of Internal Medicine                 | General & Internal Medicine               | 1                  |
| QJM: An International Journal of Medicine    | General & Internal Medicine               | 1                  |
| Journal of Foot & Ankle Surgery              | Orthopedics; Surgery                      | 1                  |
| Plos One                                     | Science & Technology—Other Topic          | 1                  |
| American Journal of Surgery                  | Surgery                                   | 1                  |
| Journal of the American College of Surgery   | Surgery                                   | 1                  |
| Journal of Vascular Surgery                  | Surgery; Cardiovascular System & Cardiology | 1                  |

**Table 3. Articles Classified by Study Type.**

| Study type                          | Number of articles |
|-------------------------------------|--------------------|
| Basic science                       | 6                  |
| Randomized controlled trial         | 12                 |
| Cohort study                        | 14                 |
| Case–control study                  | 3                  |
| Case series                         | 4                  |
| Case report                         | 0                  |
| Systematic review                   | 2                  |
| Expert opinion/review               | 15                 |

**Figure 2.** Total number of articles by level of evidence.
were at a disadvantage because of the clear time effect in bibliometric analysis.\textsuperscript{90} Therefore, it would be necessary to update this list as the field continues to progress. Since the primary aim of our study was to rank highly influential works on DFU research by using total citation counts, these limitations should not significantly affect our conclusions.

Conclusions

This study identified the top-cited DFU articles and provided useful insights into the history and development of DFU research. This list could serve as a quick reference for educational purposes and clinical practice, in addition to providing a foundation for further studies on this topic.

Author Contributions

Concept and design: Lin Li; Acquisition, analysis, or interpretation of data: Jiaxing You, Chao Liu, Yixin Chen, Weifen Zhu; Drafting of the manuscript: Jiaxing You, Chao Liu; Tables and Figures construction: Yixin Chen, Weifen Zhu, Hongye Li; Supervision: Hongye Li, Lin Li.

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