

The relationship between anal disease and quality of life: a bibliometric study

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Background: Anal disease has a significant impact on patients' quality of life (QoL), and surgical treatment may further diminish QoL. The purpose of this study was to conduct bibliometric analysis to investigate the profile of studies on anorectal disease-related QoL.

Methods: The database of Science Citation Index Expanded (SCI-E) in Web of Science Core Collection (WOSCC) was searched. The search terms were "anal diseases" and "quality of life". The bibliometric package of R software was used to analyze the literature on anorectal diseases and QoL. The content of the analysis included the following: the number of papers published in this field by each country, the cooperation relationship between countries, the number of papers published by institutions, the cooperation relationship between institutions, the number of papers published by researchers, the cooperation relationship between researchers, the citations of researchers, the number of articles published in journals, and the use of keywords.

Results: A total of 1,130 related research literature records were retrieved in this study. An annually increasing trend was detected in the number of published papers and the number of citations. Developed countries in Europe and America, mainly the United States, the United Kingdom (UK), and Germany, were in a leading position in this field. The Cleveland Clinic Foundation and Mayo Clinic in the United States, St. Mark's Hospital in the UK, and the University of Toronto in Canada were the leading research institutions in this field. The top 3 researchers with the most published papers were Feza H. Remzi, Bo Shen, and Victor W. Fazio. Collaboration among researchers was clustered. There were more high-quality related articles in professional journals of anal diseases. The use of keywords suggested a temporal change in research focus, but randomized controlled studies were found to be lacking.

Conclusions: Asian countries should participate in more collaborative research projects in the field of anorectal disease, and more randomized controlled studies should be conducted overall.

Keywords: Anal disease; quality of life (QoL); bibliometric research

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Introduction

Anal diseases are one of the most common diseases in clinical practice, including hemorrhoids, anal fistulas, anal fissures, perianal abscesses, and perianal pruritus, which were mainly related with the diet, bowel habits, stress. In an epidemiological study in the United States of America (USA), it was revealed that about 1 million (or 4.4%) of Americans had symptoms due to hemorrhoids (1). In United Kingdom (UK) studies, the prevalence of hemorrhoids ranges from 12% to 36% (2,3). In a survey study across 4 European Union (EU) countries, the results showed that the annual incidence of anal fistula was 12–28 cases/100,000 people (4). Hemorrhoids, anal fistulas, anal fissures, and perianal abscesses often require surgical treatment, and during the operation, tissues around the anus are often damaged, resulting in a decline in anal function and the requirement for frequent local cleaning, causing great inconvenience to the patient (5,6). In addition, due to the abundance of nociceptors in the anus, patients with anal diseases are more sensitive to pain. These characteristics lead to psychological reactions of anxiety and depression in affected patients, especially in social situations, which seriously affect the patients' daily life and significantly reduce their quality of life (QoL) (7–9). The QoL has become an important topic in current clinical medical research, and while paying attention to the effect of treatment, researchers also pay attention to the impact of disease and treatment on the QoL of patients. This approach facilitates a more comprehensive evaluation of the repercussions of disease and the effect and safety of treatment (10,11). Therefore, current clinical medicine, especially the related research on surgical treatment, attaches great importance to QoL research (12). In recent years, a great progress of the treatment for anal disease has been made, including ligation of intersphincteric fistula tract (LIFT) and video assisted anal fistula technology (VAAFT). Due to the huge number of papers published each year, it is often difficult to quickly locate high-quality research when conducting a literature search, and it can be challenging to fathom the overall situation of related research (13,14). Bibliometrics is the retrieval and statistical analysis of literature in a specific field. Through analysis, bibliometrics can display the leading countries, institutions, researchers, and professional journals in the research of a specific field, and can analyze keywords and subject words. It is helpful for researchers to have a comprehensive understanding of the relevant research and adopt more targeted strategies during

literature retrieval (15,16). The purpose of this study was to analyze the profile of studies on QoL related to anorectal disease using a bibliometric approach.

Methods

Literature search

Data source

This study used the Science Citation Index Expanded (SCI-E) database in the Web of Science Core Collection (WOSCC) as the data source for retrieval. The SCI-E is currently the main data source for bibliometrics research. It mainly includes English-language documents (including documents in other languages but with English abstracts), which basically reflects the main achievements of scientific research worldwide.

Search strategy

In this study, a “topic search” was used, and the search terms were “anal diseases” and “quality of life”. There was no time limit imposed for publication of articles. The last search date for this study was 9 December 2021.

De-duplication of documents

When there were duplicate records in the search results, we deleted conference papers, conference abstracts, and records published in advance online that were duplicates of officially published documents.

Analysis method

All records of search results and cited references were exported in plain text format, and the bibliometrix package of R software (<https://www.bibliometrix.org/>) was used to analyze the literature on anal diseases and QoL. The content of the analysis included: the number of papers published in this field by each country, the cooperation relationship between countries, the number of papers published by institutions, the cooperation relationship between institutions, the number of papers published by researchers, the cooperation relationship between researchers, the citations of researchers, the number of articles published in journals, the use of keywords, and so on.

Statistical analysis

Excel software (version 2019, Microsoft, Redmond, WA,

USA) was used to draw the change trend chart of the number of publications in this field each year and the trend chart of the number of citations. Qualitative data were expressed in numbers and percentages.

Results

Basic information

We retrieved 1,259 related research literature records, including: 870 original articles, 235 reviews, 123 conference papers, 13 editorials, 12 online first publications, 5 conference abstracts, and 1 letter, of which 129 were repeated. After removal of duplicates, a total of 1,130 actual articles remained (Table 1). The results of the analysis showed an increasing trend in the number of articles published each year (Figure 1). These articles were cited a total of 37,794 times, with an average of 33.45 citations per article and an h-index of 84. The analysis

showed that the total number of citations was increasing every year (Figure 1).

Country analysis

The statistical results showed that 52 countries had published related research in this field, the number of articles published in each country was 1–1,004, and some of them had cooperative relationships in some articles. The top 10 countries with the largest number of published papers were predominantly developed countries in Europe, America, China, and Japan (Table 2, Figure 2). Among these countries, the USA and Canada had cooperated most with other countries, while China had cooperated less with other

Table 1 Types of documents in search results (duplicate documents not removed)

Document types	Record count	% of 1,130
Original articles	870	76.99
Reviews	235	20.80
Conference papers	123	10.88
Editorials	13	1.15
Online first publications	12	1.06
Conference abstracts	5	0.44
Letter	1	0.09

Table 2 Ranking of countries by number of publications (top 10)

Rank	Region	Freq
1	USA	1,004
2	UK	525
3	Germany	296
4	France	271
5	Italy	254
6	Netherlands	178
7	Canada	160
8	Japan	157
9	China	117
10	Spain	117

USA, United States of America; UK, United Kingdom.

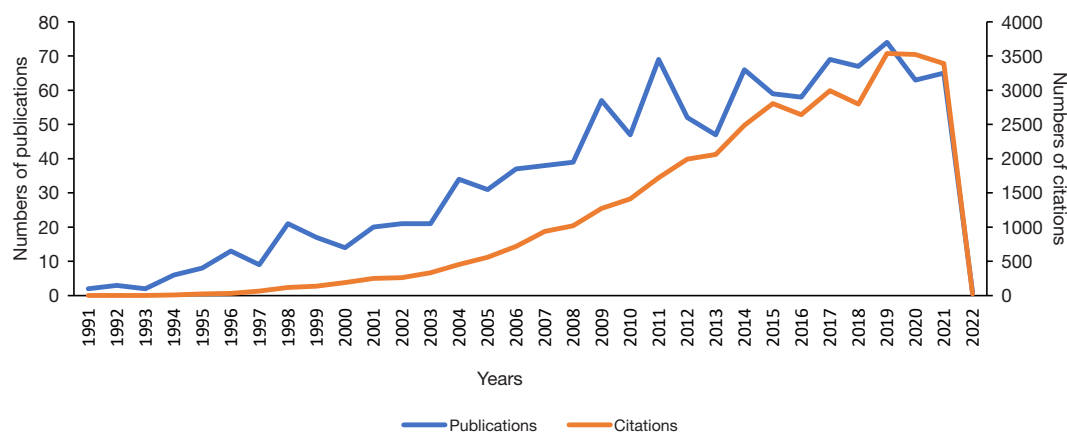


Figure 1 Annual changes in the number of publications and the number of citations.

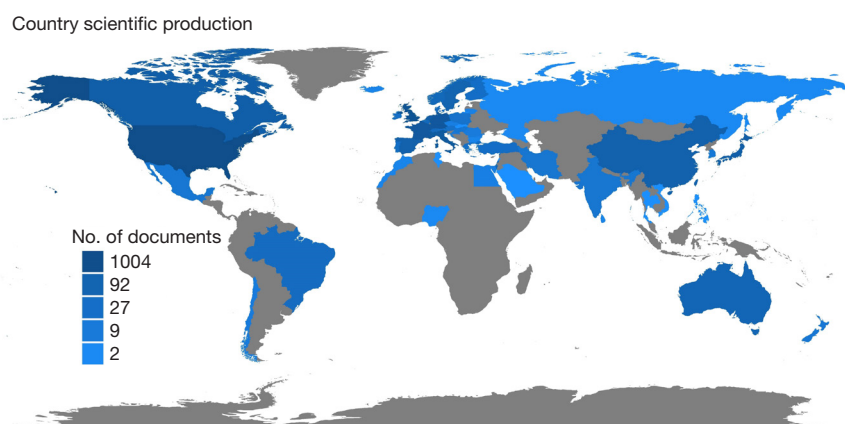


Figure 2 Number of publications by countries.

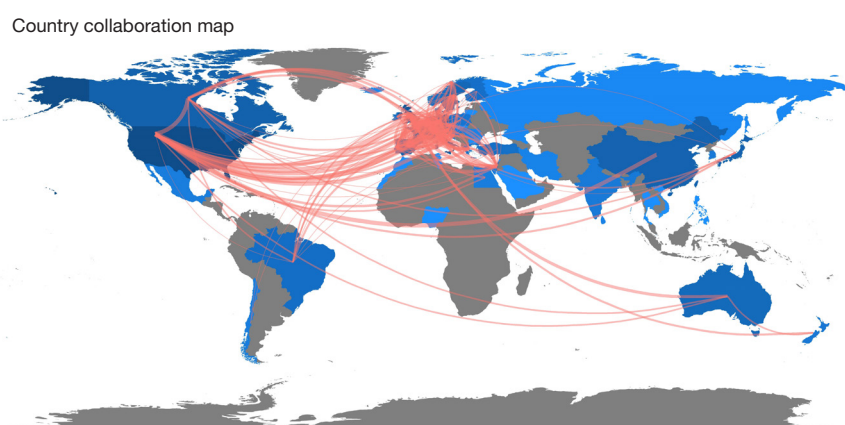


Figure 3 Cooperation between countries.

countries (Figure 3). In terms of the number of citations, the USA was significantly more cited than other countries, followed by the UK and Germany, which may be related to the largest number and higher quality of literature published by these countries (Figure 4).

Institutional analysis

The top 3 institutions with the largest number of published papers were the Cleveland Clinic Foundation, Mayo Clinic, and the University of Toronto (Figure 5), and most of the top 20 institutions were from the USA, Canada, and other developed countries. Major research institutions, including Cleveland Clinic Foundation, Mayo Clinic, and St. Mark's Hospital, had collaborated extensively with several other institutions (Figure 6).

Author analysis

It was revealed that many researchers had published more than 10 papers in this field, and the top 3 prolific researchers were Feza H. Remzi, Bo Shen, and Victor W. Fazio, all from Cleveland Clinic Foundation (Figure 7). Collaboration among researchers showed a clustered distribution (Figure 8), suggesting that there may be frequent collaborations between them, and collaborative studies were cited more often (Figures 9,10).

Journal distribution

The core journals, determined according to Bradford's law, were: *Diseases of The Colon & Rectum*, *Inflammatory Bowel Diseases*, *Colorectal Disease*, *International Journal of*

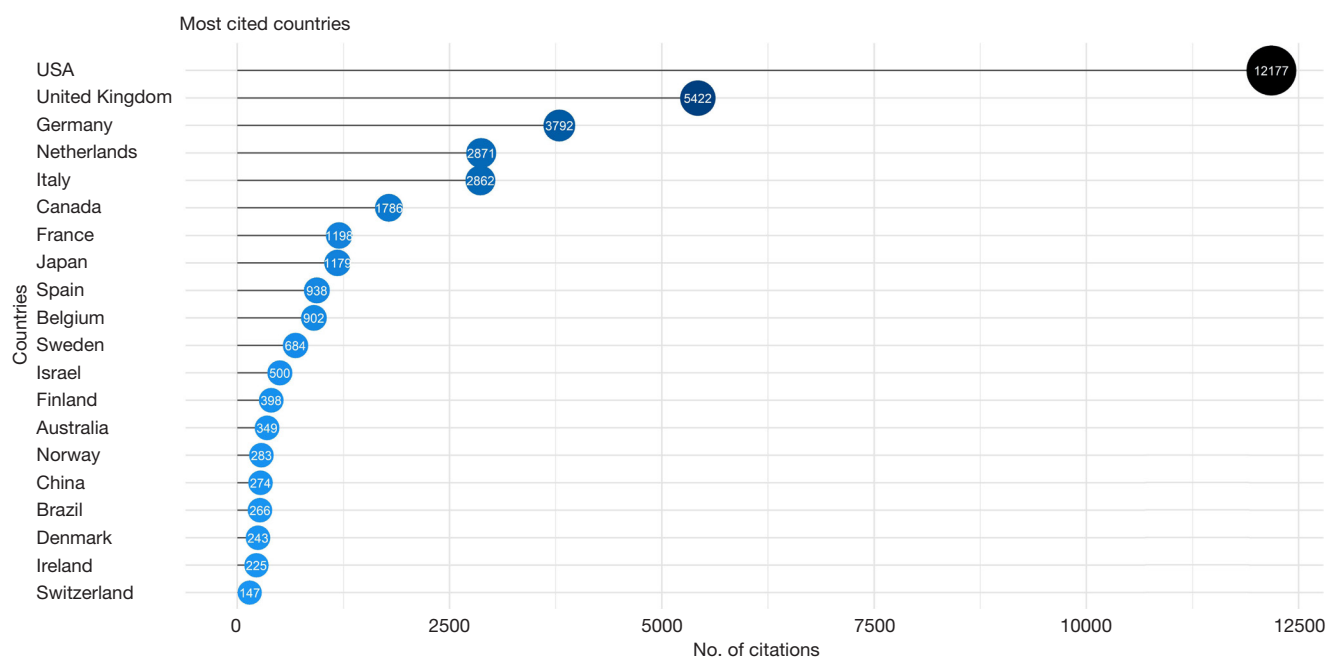


Figure 4 Visualization map of the citations ranking of articles published in countries (top 20).

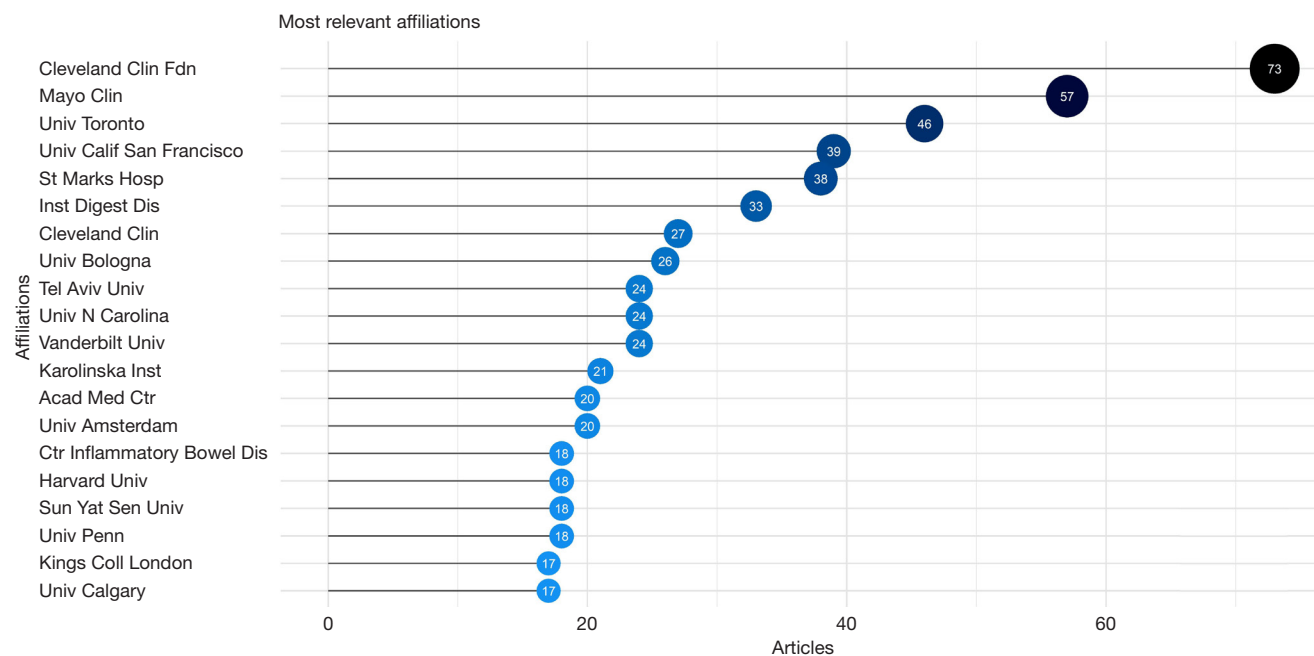


Figure 5 Ranking of the number of articles published by institution (top 20).

Colorectal Disease, Journal of Crohn's & Colitis, World Journal of Gastroenterology, American Journal of Gastroenterology, and Journal of Gastrointestinal Surgery (Figures 11,12).

Keyword analysis

The results of the analysis showed that the top 3 most frequently used keywords were quality-of-life, pouch-anal

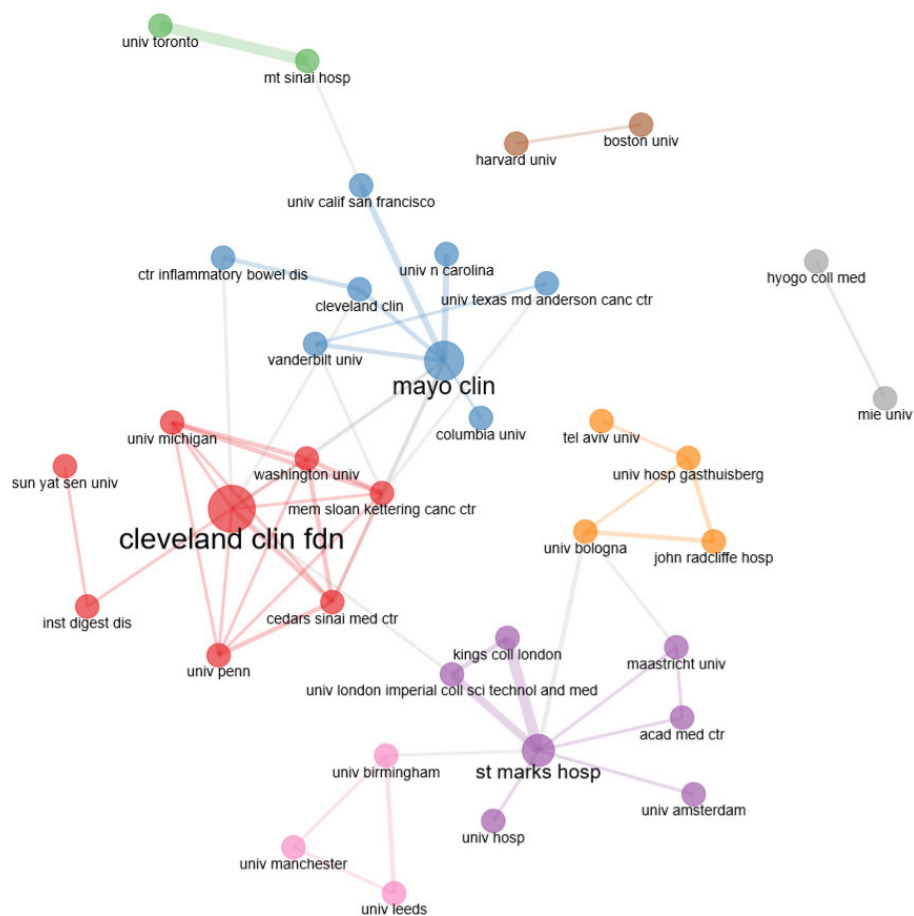
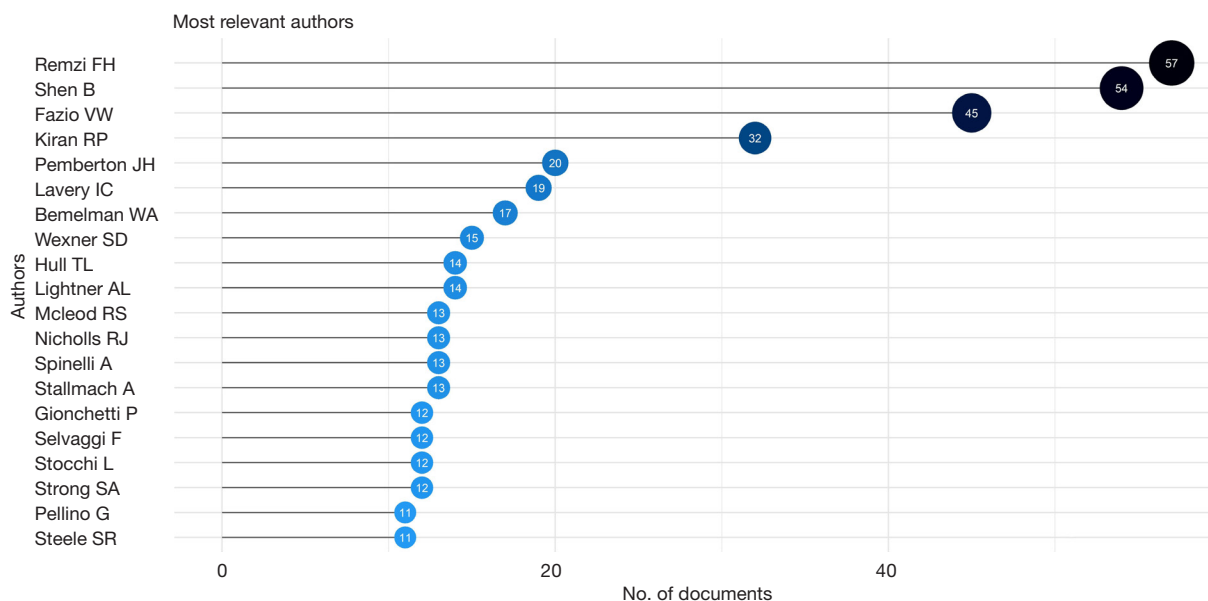


Figure 6 Visualization map of institutional cooperation.



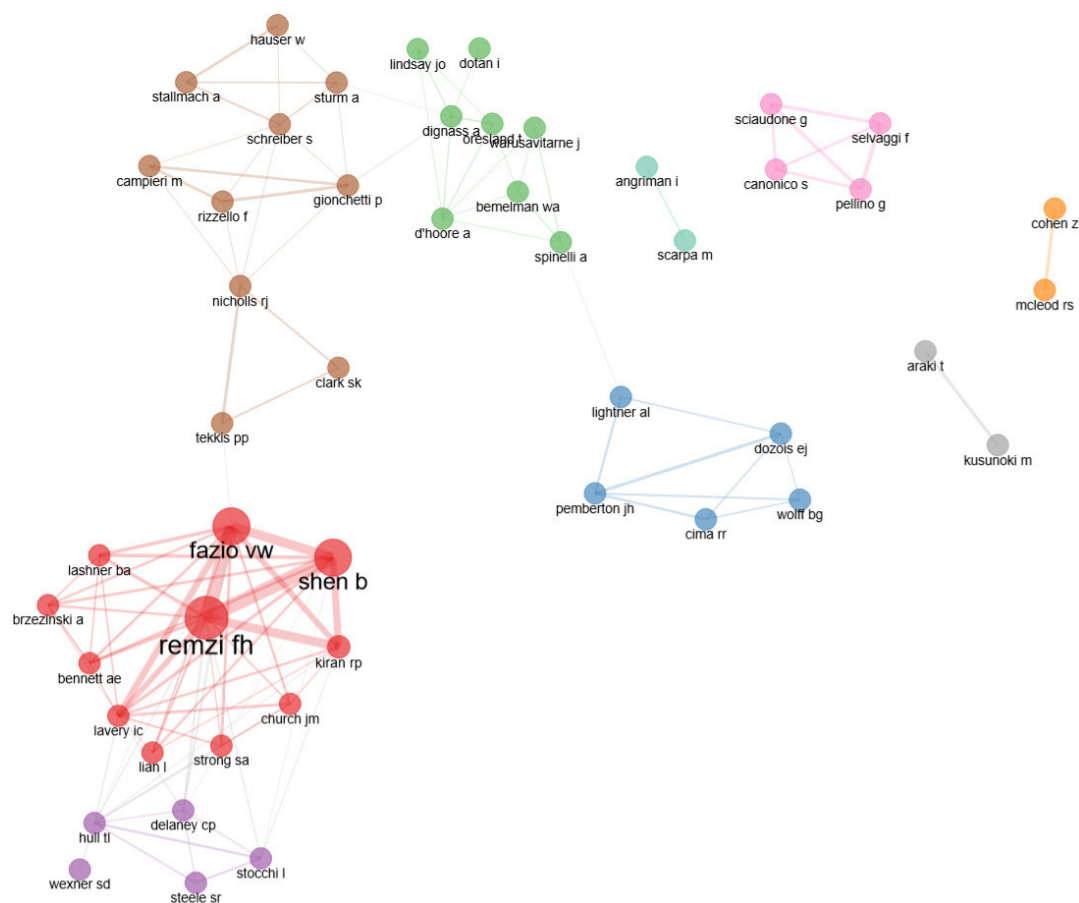


Figure 8 Author co-authored visualization map.

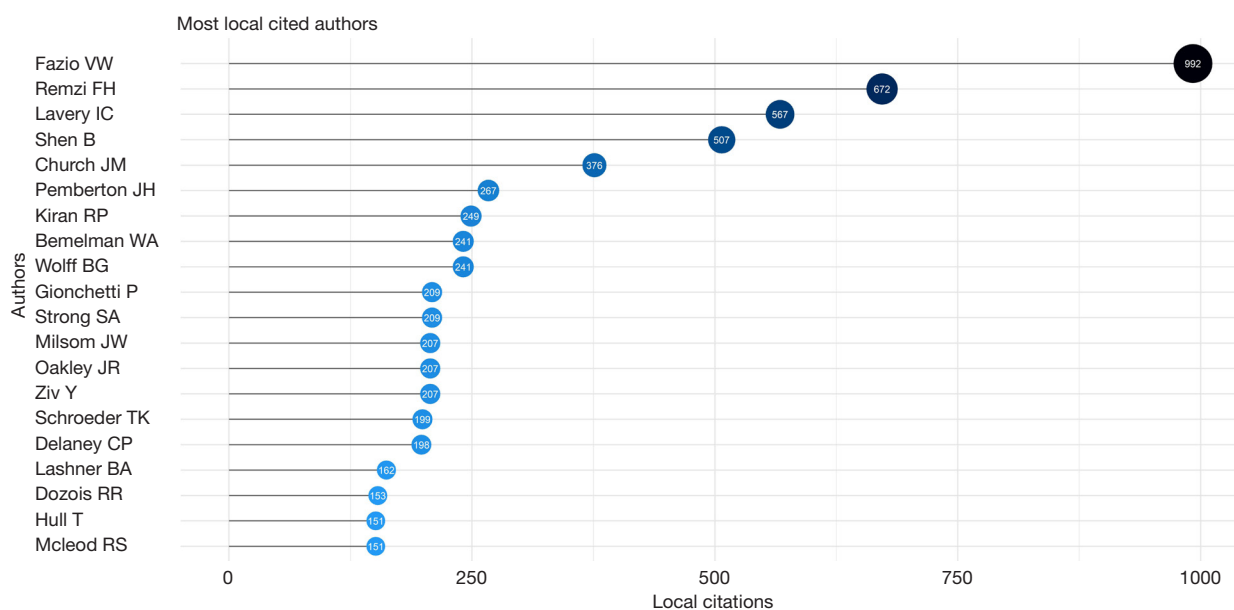


Figure 9 Ranking of authors with high citations (top 20).

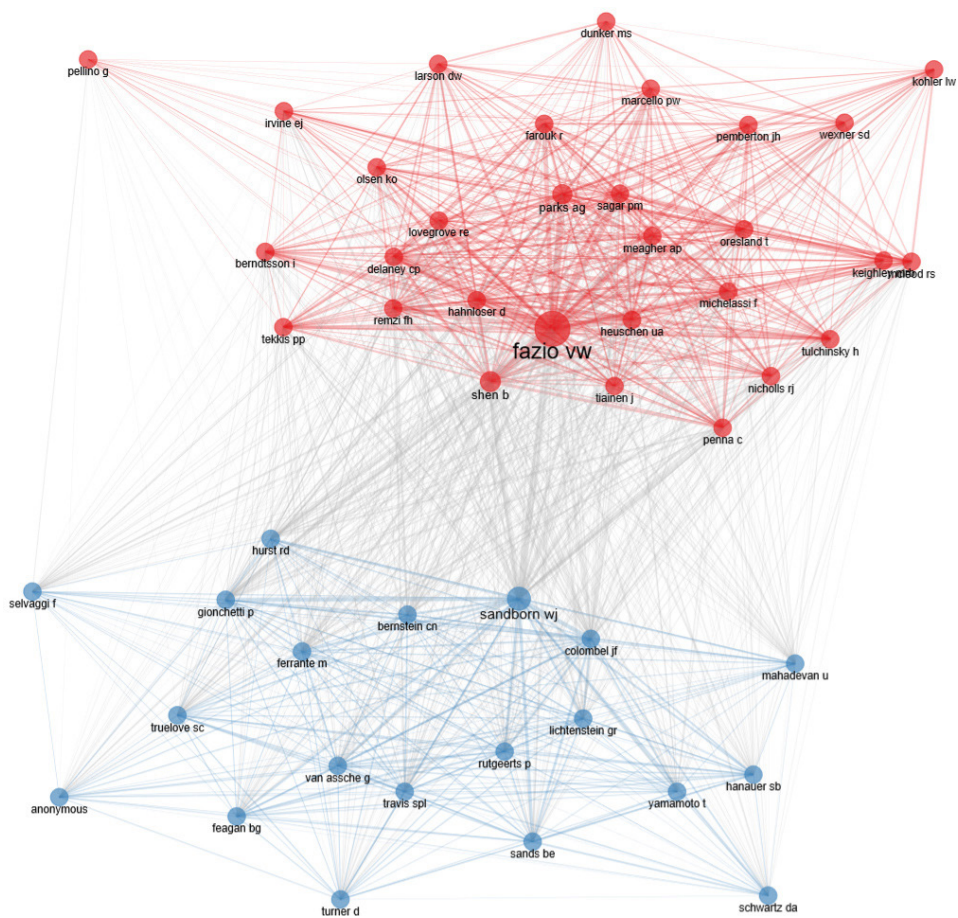


Figure 10 Visualization map of co-cited authors.

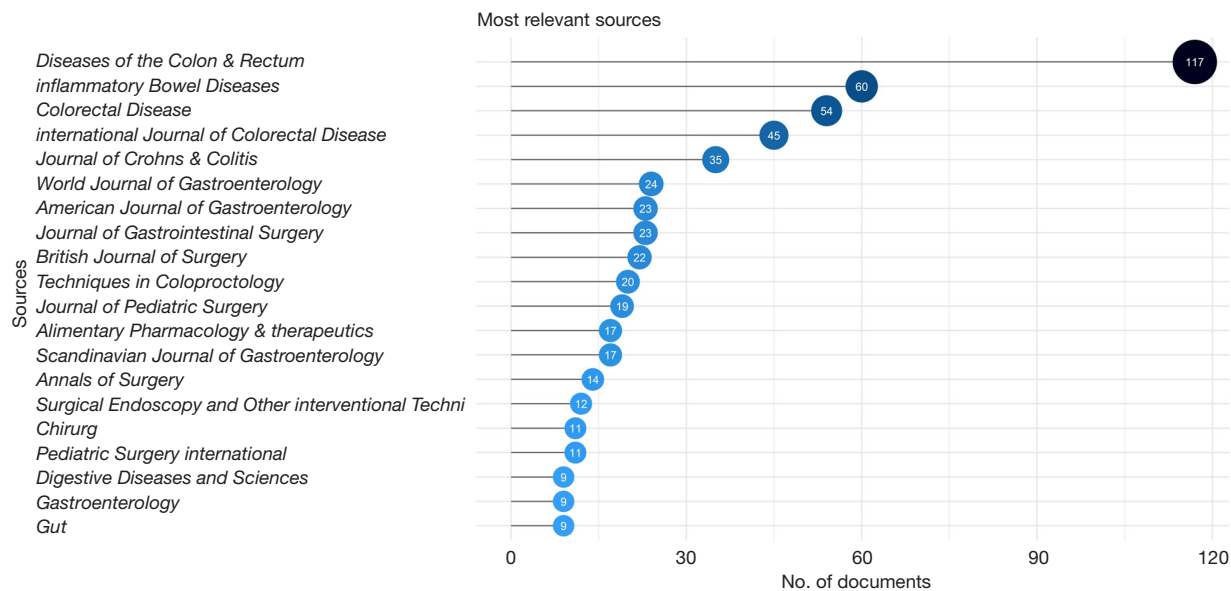


Figure 11 Ranking of the number of articles published in journals (top 20).

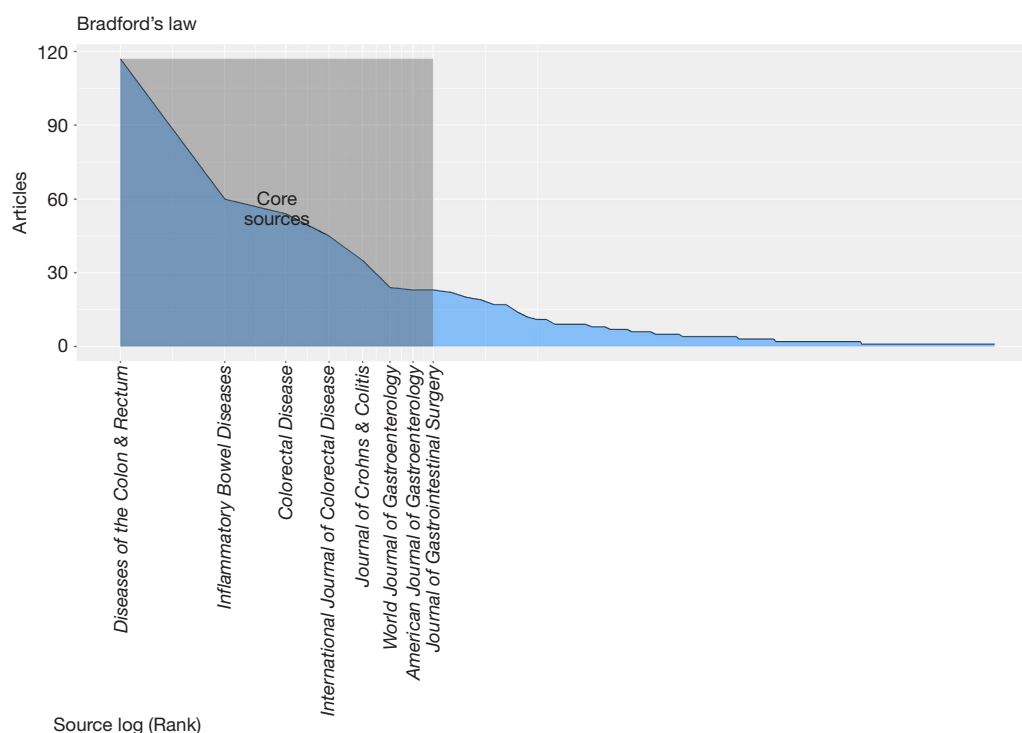


Figure 12 Identification of core journals based on Bradford's law.

anastomosis, and restorative proctocolectomy (*Figure 13*). These commonly used keywords were used to form 3 groups (*Table 3*, *Figure 14*), and each group represented a different intensity of simultaneous use of keywords. As can be seen in *Figure 14*, the literature in the field reflected a substantial research focus on surgical modalities that improve patient QoL. The usage of keywords changed over time (*Figure 15*). The wave chart shows that the frequency and combination of keywords have changed at each stage. However, in the use of keywords, randomized controlled trials (RCTs) have appeared less frequently.

Discussion

This study performed a bibliometric analysis of studies on anal disease-related QoL. Our search results showed that the research in this area is dominated by developed countries in Europe and America, such as the USA, the UK, and Germany, and extensive cooperation has been carried out among these countries. In particular, medical centers/research institutions such as Cleveland Clinic Foundation, Mayo Clinic in the USA, and St. Mark's Hospital in the UK are in a leading position in the research in this field, and the researchers with the most published papers and the

most citations are also from these countries and research institutions. Although China has published a lot of relevant literature, there has been little cooperation between China and other countries. According to Bradford's law, the core journals in this field are mainly journals specialized in anal diseases. The results of keyword analysis showed that the research in this field has focused on the impact of different surgical treatment methods on the QoL.

The most significant impact of anal disease is the change in bowel habits, and this change has a great impact on the patient's daily life, often resulting in vast physical and psychological symptoms (17-19). The treatment of common anal diseases, including anal fistula, perianal abscess, anal fissure, hemorrhoids, and so on, will cause further damage to the patient, lead to anal dysfunction, and seriously affect their QoL (8). Therefore, in clinical practice, while treating anal diseases, doctors and researchers also pay increasing attention to patient QoL. First, the impact on QoL has gradually become one of the main considerations for the choice of treatment methods. Doctors no longer only pay attention to whether the disease is cured or not, but also whether the treatment causes serious or long-term damage to the patient's QoL (20). Second, researchers are exploring improved treatment and surgical methods to reduce further damage to

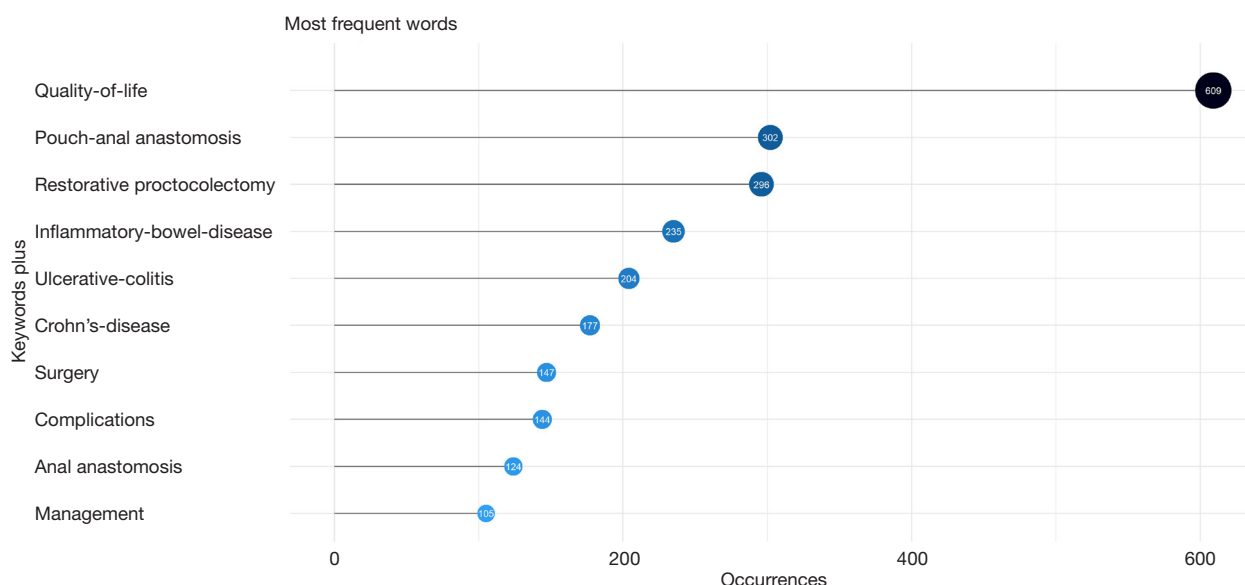


Figure 13 Frequency of keyword usage (top 10).

Table 3 Keyword group distribution characteristics

Rank	Node	Cluster	Betweenness
1	Quality-of-life	1	282.61405260
2	Surgery	3	27.06749605
3	Pouch-anal anastomosis	1	55.42076828
4	Inflammatory-bowel-disease	1	30.77036745
5	Restorative proctocolectomy	2	44.52472426
6	Crohn's disease	1	16.22126556
7	Ulcerative colitis	2	20.90004020
8	Complications	2	10.25566444
9	Anal anastomosis	2	10.28081130
10	Risk factors	2	2.933250992

anal function due to treatment (21). Third, many studies not only focus on short-term incision healing, but also focus on long-term follow-up to observe the recovery of postoperative anal function in patients (22,23). There have also been studies focusing not only on incision healing, anal function, but on psychological changes in patients (24,25).

The USA, the UK, Germany, and other countries are not only in the leading position in clinical medicine in the world, but also in the forefront of human care. Among researchers in this field, those in developed countries in Europe and the USA have carried out a large number of studies, and some

of the studies have been multi-center collaborative studies which have obtained sufficient clinical evidence. The results of this study show that some important research institutions have conducted an abundance of research in this field, and also found researchers with prominent positions in this field and important core journals, which is information of great importance to relevant researchers. First, the results of this study provide a certain reference value for researchers to conduct a literature search, and can facilitate rapid obtainment of high-quality research literature by restricting research institutions or authors; second, when conducting academic exchanges, or determining further study, investigators can refer to the results of this study and select an outstanding research institution; third, when considering multi-center research, investigators can refer to the results of this study, contact authoritative research institutions or researchers to participate in the research, or offer assistance at the same time. The results of this study show that RCTs appear less frequently as a keyword, suggesting that there is a lack of randomized controlled studies in this field. Meantime, we think that the hotspot of anal disease in the future maybe lie in the minimally invasive treatment with protection of anal function. And we suggested that more studies should be carried out to assess the longtime influence of treatment on QoL in patients with anal diseases.

The limitations of this study were as follows: The retrieval strategy used subject headings, and did not search

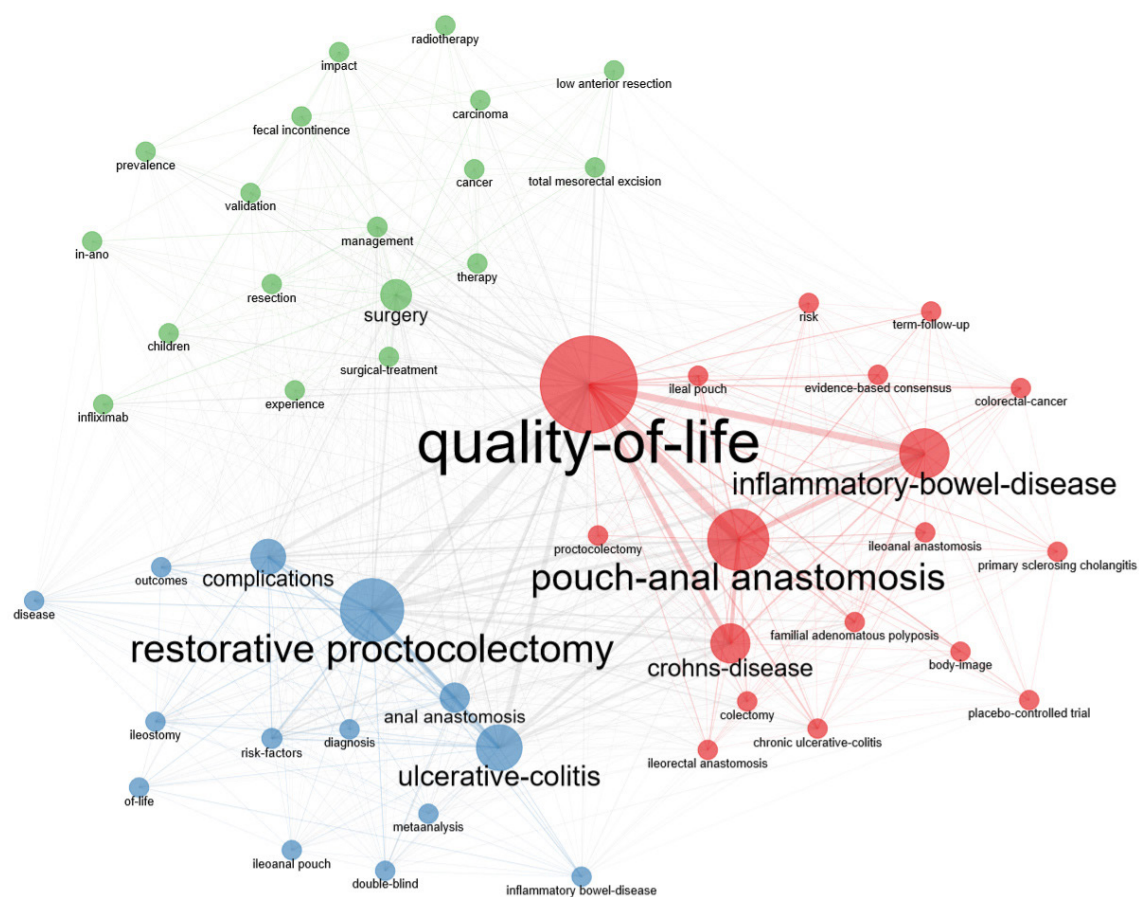


Figure 14 Keyword co-occurrence map.

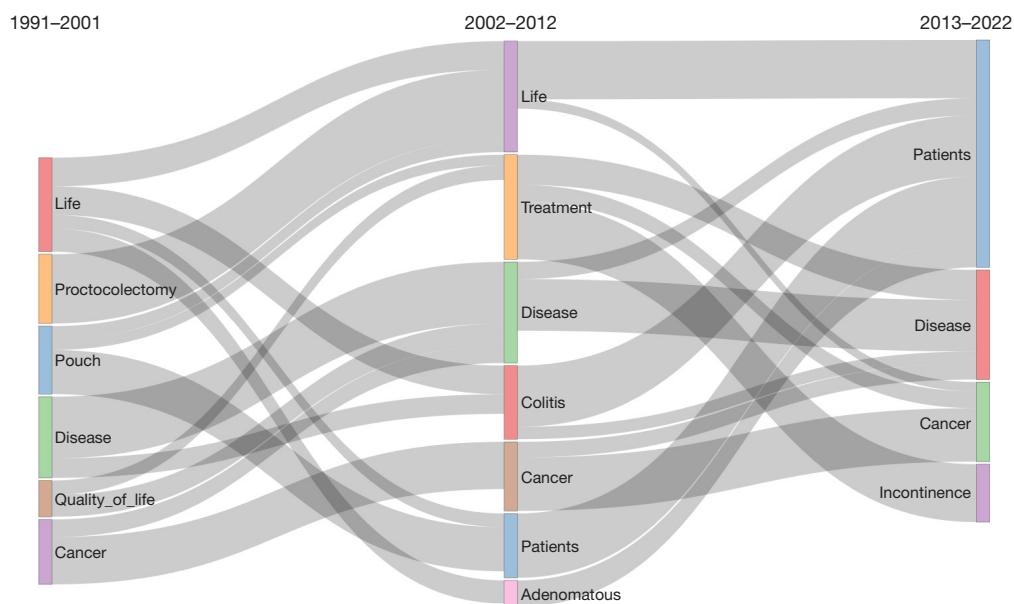


Figure 15 Wave chart of thematic evolution.

for specific various anal diseases related to the QoL, and some articles that did not use “anal disease” as the subject heading may have thus been missed. As the SCI-E database only includes English documents and some other language documents with English abstracts, a large number of non-English documents were not included, and many medical journals in other languages often publish important documents, which might have been missed in this study.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://atm.amegroups.com/article/view/10.21037/atm-22-1372/coif>). The authors have no conflicts of interest to declare

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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