Medical Crowdfunding: Bibliometric And Thematic Mapping

Sağlık Hizmetlerinde Kitlesel Fonlama: Bibliyometrik ve Görsel Haritalama Analizi

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Abstract: Medical crowdfunding has emerged as an alternative response to rising healthcare costs, limited insurance coverage, and access inequalities. Despite growing global interest, the academic literature remains fragmented and conceptually dispersed. This study maps the academic landscape of medical crowdfunding through a bibliometric analysis of 222 publications indexed in Web of Science and Scopus between 2014 and 2024. Using R-based bibliometric analysis tools (Bibliometrix package), co-authorship, co-citation, keyword co-occurrence, thematic mapping, and historiographic analyses were conducted. Results indicate a strong post-COVID-19 expansion, with an annual publication growth rate of 44.61%. Snyder, Crooks, and Kenworthy are the most influential authors, while Simon Fraser University and Washington University lead institutionally. The literature clusters around two core themes: ethical and policy-oriented critiques, and studies on digital platforms and campaign success. Findings indicate that medical crowdfunding constitutes a socio-technical phenomenon requiring interdisciplinary and normatively grounded analytical approaches.

Keywords: Crowdfunding, Financial System, Health, Bibliometric Analysis, Medical Finance.

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Öz: Tıbbi kitle fonlaması, artan sağlık maliyetleri, sınırlı sigorta kapsamı ve erişim eşitsizliklerine yanıt olarak ortaya çıkan alternatif bir finansman modelidir. Küresel ilgi artmasına rağmen literatür parçalı bir yapı sergilemektedir. Bu çalışma, 2014–2024 döneminde Web of Science ve Scopus'ta yer alan 222 yayını bibliyometrik yöntemlerle analiz ederek alanın akademik yapısını haritalandırmaktadır. R tabanlı analizlerde eş yazarlık, eş atıf, anahtar kelime birlikte kullanımı ve tematik haritalama teknikleri uygulanmıştır. Bulgular, COVID-19 sonrası dönemde yıllık %44,61'lik güçlü bir yayın artışına işaret etmektedir. Snyder, Crooks ve Kenworthy öne çıkan yazarlar; Simon Fraser Üniversitesi ve Washington Üniversitesi ise başlıca kurumlardır. Literatür, etik ve politika odaklı eleştirel çalışmalar ile dijital platformlar ve kampanya başarısına odaklanan araştırmalar etrafında kümelenmektedir. Sonuçlar, tıbbi kitle fonlamasının etik temelli ve disiplinler arası yaklaşımlar gerektiren bir sosyo-teknik olgu olduğunu göstermektedir.

Anahtar Kelimeler: Kitle Fonlaması, Finansal Sistem, Sağlık, Bibliyometrik Analiz, Tıbbi Finans.

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1. Intruduction

In recent years, rising healthcare costs, inadequate insurance coverage, and persistent inequalities in access to medical services have led to the widespread adoption of crowdfunding in the health sector. These developments have given rise to a specific application known as "medical crowdfunding," in which individuals seek financial support for health-related expenses via online platforms (Cai et al., 2025). In this context, it becomes essential to examine how this phenomenon has been reflected in academic scholarship.

A systematic review of the existing literature contributes significantly to shaping a study's methodological design, scope, and theoretical positioning. A systematic evaluation of the literature reveals recent developments and existing research gaps, thus laying the groundwork for more meaningful and comprehensive studies. This process is based on the understanding that, in analyzing developments or issues in a scientific field, academic publications provide reliable and objective findings that are widely accepted in scholarly communities (Bahçe & Tolon, 2022:124).

Bibliometrics is an interdisciplinary research field that enables the quantitative analysis of various information sources using mathematical and statistical methods (Blanco-Mesa et al., 2017; Aziz et al., 2023:2). This field aims to reach scientific findings by evaluating the characteristics of academic publications such as books, journals, theses and articles with numerical methods (Al & Coştur, 2007:144). Bibliometric studies analyze variables like author profiles, institutional affiliations, research topics, cited sources, citations, and keywords using descriptive statistics (Çetinkaya Bozkurt & Çetin, 2016:232). This method directs scientific research by providing researchers with the opportunity to highlight the most effective publications by providing systematic access to the literature. In addition, it can reveal the number of articles published in certain time periods and clearly shows the impact of a study on the literature (Öztürk & Kurutkan, 2020:2).

From this standpoint, bibliometric analysis has been widely applied across diverse research domains. One such area is the practice of crowdfunding, which has gained prominence in recent years within the context of entrepreneurs' search for alternative finance. Entrepreneurs are increasingly opting for new models aimed at securing financial support directly from the community or the wider crowd, rather than from traditional sources of finance such as angel investors, venture capital funds, or banks (Song & van Boeschoten, 2015:1; Beier & Wagner, 2016:3584). In this regard, crowdfunding is particularly noteworthy as a model of finance that is conducted via digital platforms and is now rapidly becoming widespread.

Medical crowdfunding is emerging as an alternative method of finance to cover health-related expenditures, particularly in circumstances where health insurance coverage is limited (Cai et al., 2025). This method is based on individuals raising donations via digital platforms to meet the costs of medical treatment or associated expenses. Although medical crowdfunding is still considered marginal in terms of total funding volume, it is observed to be gaining rapid momentum in many countries and is of growing importance as a means to mitigate the impacts of government constraints on public health expenditure (Bassani et al., 2019). Within the framework of current definitions, it has been established that medical crowdfunding is still a developing field and that, in this context, in-depth bibliometric analyses have not been conducted, or have been performed only in limited numbers.

When the studies on crowdfunding in the international literature are analysed, it is determined that the studies are mostly aimed at examining a specific subject. However, the fact that there has not been a bibliometric study covering issues such as general categories, trends and topics of the studies and compiling the studies on crowdfunding applied in health services constitutes the original value of this study.

In this context, the aim of the study is to analyse academic publications on the use of crowdfunding in the health sector using bibliometric methods, in order to reveal the trends, research gaps, and prominent contributions within the literature. Through the analysis thus performed, the structural characteristics of studies in the relevant field are described, and the intention is to present findings that will serve as a guide for future research.

2. Conceptual Framework

2.1. Crowdfunding

After the 2008 global financial crisis, the difficulties experienced by entrepreneurs in accessing traditional financing sources brought alternative financing searches to the agenda. In this context, the crowdfunding model, which has gained importance, has emerged as an innovative financing approach based on obtaining resources in small amounts from a large number of individuals (Vural & Doğan, 2019:90). Crowdfunding is considered not only as an alternative source of capital, but also as a participatory financing model that mobilises the knowledge, experience and expertise of communities. The concept originates from the term 'crowdsourcing', and it refers to the procurement of necessary resources from external stakeholders, signifying the inclusion not only of financial, but also of social and intellectual contributions in the process (Hemer, 2011)

The development of this model has accelerated further through the opportunities provided by financial technologies (FinTech). Within the FinTech ecosystem, crowdfunding is positioned as a flexible tool that allows various stakeholders to participate with different expectations and objectives. According to Mollick (2014), this method is an innovative system that can be used to finance initiatives while offering returns such as shares or rewards to supporters. The widespread adoption of the internet and social media has made this model more accessible and scalable. Crowdfunding practices have now become a transformative tool, adopted not only in the entrepreneurial sphere but also across a wide variety of sectors, including the arts, health, education, and civil society (Pribadi et al., 2024). The ability of large numbers of individuals to finance major projects with small contributions via digital platforms is the main feature that makes this method an alternative to traditional systems (Ordanini et al., 2011:445).

In the literature, crowdfunding is typically classified into four main types: donation-based, reward-based, debt-based and equity-based. These models, which differ according to the expectations of contributors and the form of return on investment, directly influence the structure of the funding processes. Donation and reward-based funding types stand out in social benefit and in applications within the healthcare sector (Mollick, 2014:2).

The main advantages of crowdfunding include faster and easier access to financing, the potential to raise capital at a lower cost, the opportunity for individuals to invest directly, the ability to build relationships through social networks, and early access to innovative products. It also provides entrepreneurs with significant flexibility to realize their ideas without engaging with traditional investors. However, the model also has some limitations and risks. These risks include uncertainties about the sustainability of projects, the possibility of fraud and abuse, cyber security threats, unauthorised sharing of project-specific information, and inadequate regulations (Vural, 2019). Therefore, although crowdfunding stands out as an innovative and inclusive model, careful planning and control mechanisms are needed in the implementation process.

2.2. Crowdfunding in Healthcare Services

In developing countries, out-of-pocket expenditure remains the primary source of healthcare services financing. This circumstance causes many households to fall below the poverty line as a result of health-related spending and to encounter significant difficulties in accessing healthcare services (Proelss, Schweizer & Zhou, 2021). The healthcare sector, particularly in pharmaceutical and treatment-related R&D, faces major barriers in developing sustainable business models from the perspective of investors (Grassi & Fantaccini, 2022). In this context, both households and healthcare providers have begun to adopt crowdfunding as an alternative solution to cover financial shortfalls.

Medical crowdfunding is an alternative financing method used by individuals to cover healthcare-related expenses. It is based on voluntary donation appeals made to large audiences through online platforms (Ba, Zhao, Song & Zhu, 2021; Lee & Lehdonvirta, 2022). These campaigns are typically conducted via social media and aim to raise funds for medical services such as treatment, surgery, medication, or rehabilitation.

This method becomes relevant particularly when public health insurance systems do not provide sufficient coverage or when private insurance fails to meet the costs. It also allows individuals to raise funds directly without relying on traditional financial intermediaries (Grassi & Fantaccini, 2022).

Medical crowdfunding campaigns are typically donation-based. These publicly accessible projects depend on various factors for success, including digital literacy, the strength of social networks, access to medical information, and the ability to craft a compelling narrative (Kenworthy et al., 2020). Although the overall funding volume remains relatively small, medical crowdfunding has been expanding rapidly worldwide. This growth reflects a rising need for individual-level solutions in response to limitations in public health expenditures (Bassani, Marinelli & Vismara, 2019).

This model has the potential to address health system inequalities at the individual level. Campaign creators often share personal stories, images, and medical documents to evoke public empathy (Wardell et al., 2024). By establishing an emotional connection, they aim to increase support. However, this dynamic shifts the burden of healthcare financing onto personal networks and public visibility. As a result, medical crowdfunding can sometimes function as a complement to public health insurance. Yet, it also carries the risk of reinforcing existing socioeconomic inequalities (Ba et al., 2021).

The structural role of medical crowdfunding within the broader system of healthcare financing can be clarified by visualizing its position alongside conventional funding flows. Figure 1 illustrates how crowdfunding platforms operate as a complementary channel when taxes, public insurance, and voluntary contributions fall short. This updated diagram also highlights the role of informal and direct financial support mechanisms.

Figure 1: Pathways of financing healthcare for households.
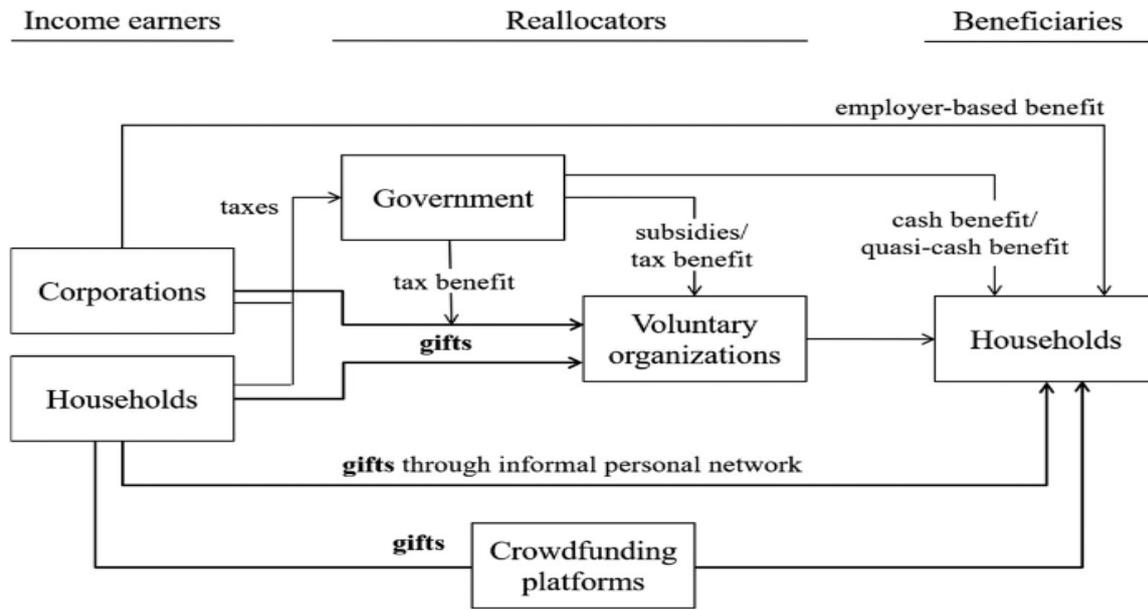
Kaynak: Lee, S., & Lehdonvirta, V., 2022: 1156.

Figure 1 illustrates the primary sources of financing that enable households to access healthcare services. Public financing, alongside social and private health insurance, are the most common among these sources. However, in cases where these systems are insufficient, crowdfunding instruments come into play as a complementary financing channel, enabling the direct transfer of funds between individuals. Some studies suggest that such donation-based approaches offer a solidarity-based structure that supports tax-funded healthcare systems (Stewart, Nonhebel, Möller & Bassett, 2022).

In this framework, a bibliometric analysis has been carried out to systematically examine the development, trends and existing research gaps of the medical crowdfunding phenomenon in the literature. This analysis

aims both to evaluate the quantitative dimension of scientific production in this field and to map the academic interest in the subject. The methodology section below provides detailed information on the construction of the dataset, the selection of the analysis tools, and the technical approaches applied.

3. Methodology

In this study, academic research on the use of crowdfunding in the field of healthcare is examined using bibliometric analysis. Although crowdfunding practices in the field of health are relatively limited, the academic accumulation in this field provides an important frame of reference.

3.1. Purpose and Importance of the Study

The main purpose of this study is to analyse scientific publications on crowdfunding in the field of health and to identify prominent countries, institutions, authors and thematic areas. The data obtained will contribute to the evaluation of the status and development potential of this financing model in the health sector. Thus, it is aimed to develop recommendations for the effective financing of health services that need more resources.

3.2. Research Questions, Methodology and Data Set

Within the scope of this study, the academic literature on crowdfunding in the field of healthcare has been examined with a quantitative approach and systematically analysed in line with specific research questions. The main research questions addressed in the study are as follows:

1. **General Trends and Publication Profile**
   o What is the distribution of academic studies on crowdfunding in the health context according to years?
   o Who are the countries, institutions and researchers publishing the most in this field?
   o What are the main research topics that stand out?
   o Which journals are the relevant publications and what are the impact values of these journals?

2. **Keywords and Thematic Structure**
   o What are the most frequently used key concepts?
   o Which themes are prominent in the literature?
   o What kind of a relational structure exists between keywords and themes?
   o What changes are observed in the topics over time?

3. **Citation Analysis**
   o Which are the most cited publications and which topics are covered?
   o How are the citation relationships in the literature structured?
   o Who are the most cited authors, institutions and countries?

4. **Collaboration and Scientific Networks**
   o How are collaboration structures shaped at the level of authors, institutions and countries?
   o How are conceptual links and thematic clusters formed among publications?
   o Who are the most active actors in terms of international collaboration?
   o What kind of structure does the co-authorship network exhibit?

5. **Publication and Citation Profile**
   o Which thematic areas do the most highly cited studies focus on?
   o Who are the most influential authors, institutions and countries in this field?
   o Which academic journals publish the most and are the most cited?
   o What are the most common citation networks and keywords in the literature?

In this research, the method of bibliometric analysis was chosen to find answers to the questions above. The dataset was obtained from the Web of Science and Scopus databases. The search was conducted using

keyword combinations such as "Crowdfunding and health", "Crowdfunding and healthcare", "Medical crowdfunding", and "Medical care and crowdfunding". The search covered publications from 2014 to 2024.

The initial search yielded 243 records from Web of Science and 198 from Scopus. After merging the datasets and removing duplicates, 287 unique entries remained. Following the exclusion of 63 unrelated publications and 2 with missing or incorrect data, the final analysis was based on 222 studies.

The data obtained were analysed using the R program and visualised with various bibliometric mapping techniques. As the study does not contain any personal data, approval from an ethics committee is not required.

3.3. Network Construction Parameters

In collaboration and country-level collaboration networks, minimum edge thresholds of 1 and 2 were applied to separately examine inclusive structures and strong-tie configurations. The Walktrap community detection algorithm was selected due to its suitability for medium-sized bibliometric networks and its ability to detect densely connected subgraphs. Association strength normalization was used in keyword co-occurrence analysis to control for frequency bias. For co-citation analysis, the top 40 most co-cited documents were included to ensure network readability while preserving structural integrity. Thematic mapping was conducted using Callon's centrality and density measures to classify themes into motor, basic, niche, and emerging clusters.

4. Findings

This section presents the bibliometric analysis results concerning academic publications that address the topic of crowdfunding in the field of health. The dataset obtained using the methodology described in the previous section has been examined in detail in terms of both content and structural characteristics.

Among the 222 studies analysed, 169 were in article format (7 in early view and 8 in review type). The remaining studies were in the form of papers, book chapters, meeting abstracts, short research, and other similar formats.

The earliest studies on medical crowdfunding were published in 2014 (1 study) and 2015 (5 studies). A notable increase in the number of publications has been observed during the 2014–2024 period, with an average annual growth rate calculated at 44.61%. As of 2024, the number of publications per year reached 40, indicating a growing academic interest in this topic.

Figure 2: Annual Distribution of Publications
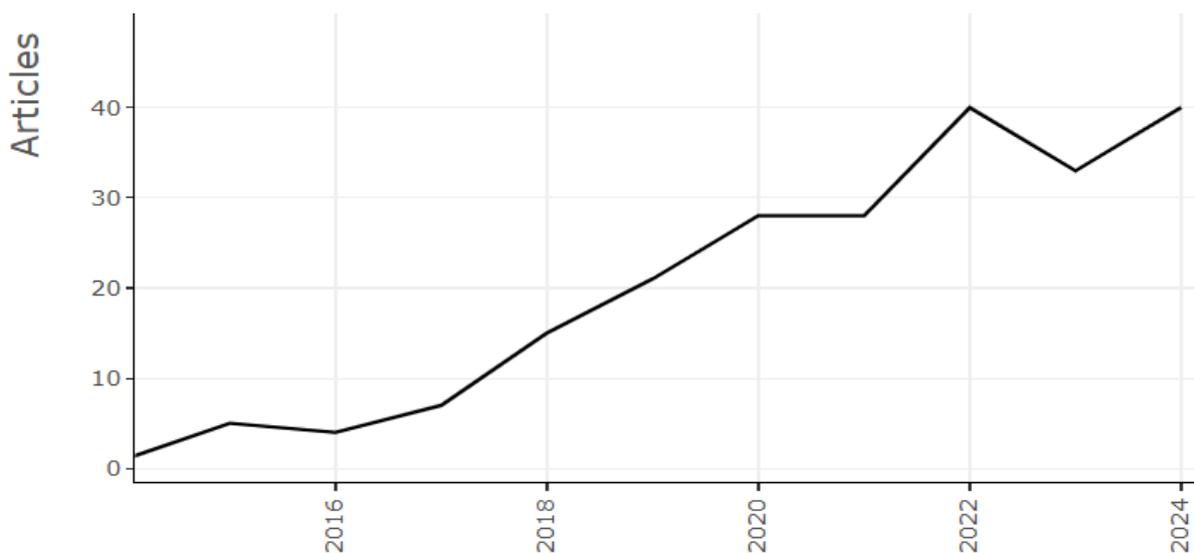
In addition, according to the data retrieved from the relevant databases, a total of 732 researchers had contributed to the literature on medical crowdfunding in the health sector by the year 2024.

The figure below illustrates the distribution of corresponding authors across countries in studies related to medical crowdfunding.

Figure 3: Distribution of Corresponding Authors by Country
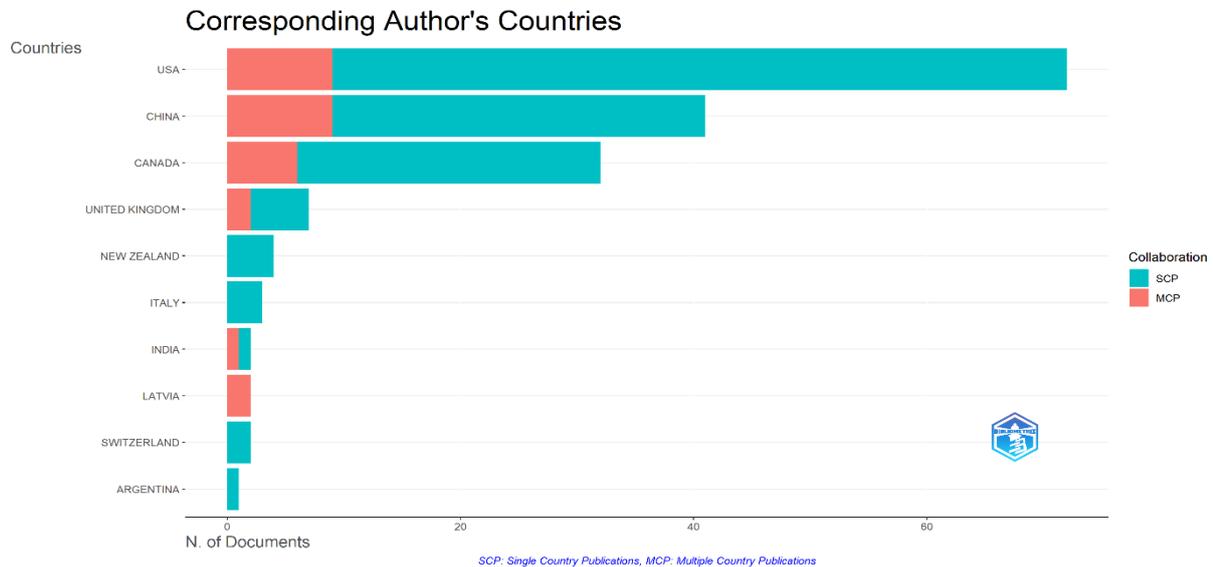
In Figure 3, SCP (Single Country Publications) refers to studies in which all authors are affiliated with the same country, while MCP (Multiple Country Publications) indicates international collaborations involving authors from different countries. According to the analysis results, the United States is the leading country in terms of publication volume, with 72 studies on medical crowdfunding. Among these, 9 were conducted in collaboration with researchers from other countries. The U.S. is followed by China with 41 publications, Canada with 32, and the United Kingdom with 7. Notably, 9 of the Chinese publications, 6 of the Canadian ones, and 2 from the UK involved international co-authorship.

Furthermore, the authors who have made the most significant academic contributions to the field are visualized in the figures below. These graphs provide a comparative overview of the number of publications by each author and the corresponding impact of those publications within the literature.
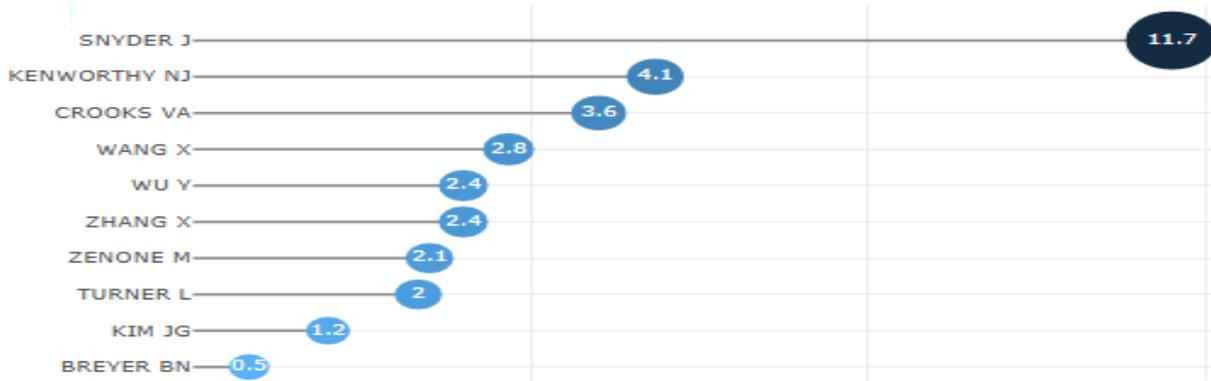
Figure 4: Most Prolific Authors in the Field
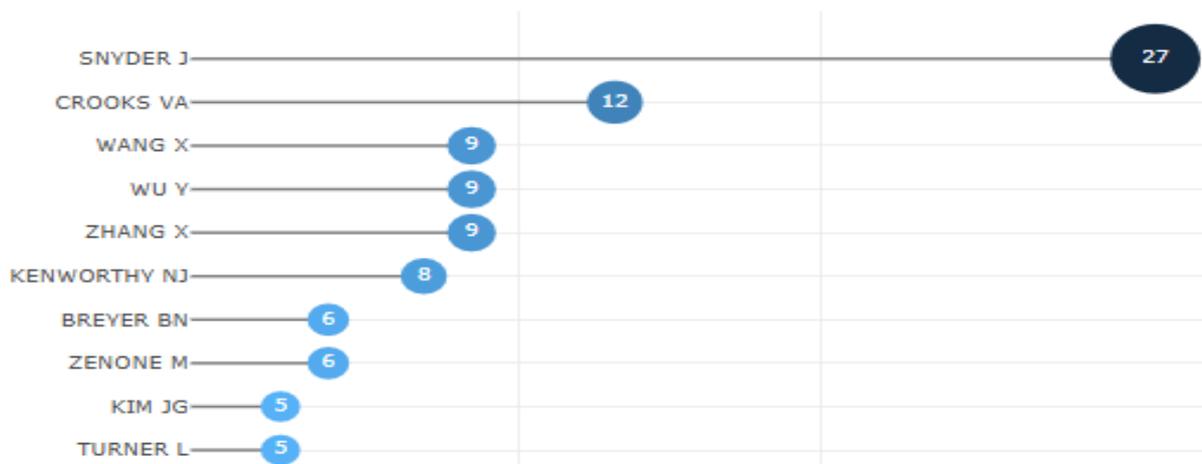
As shown in the figure, Snyder J. is the most prolific researcher in the field of medical crowdfunding, with a total of 27 publications. He is followed by Crooks V.A. with 12 publications and by Wang, Wu, and Zhang with 9 each. However, focusing solely on publication counts may not fully reflect an author's impact.

Therefore, a separate evaluation of each author's contribution to the publications has been conducted, and the results are presented in the figure below.

Figure 5: Author Contribution Scores

The figure shows that Snyder J. holds the highest contribution score, with 11.7 points. He is followed by Kenworthy with a score of 4.1. Although Kenworthy ranks sixth in terms of publication count (with 8 publications), he rises to second place in contribution score due to collaborating with fewer co-authors. Crooks V.A. ranks third with 3.6 points, followed by Wang X. with a score of 2.8.

The following presents the number of citations received by the studies authored by the ten most cited researchers.

Figure 6: Most Cited Authors in the Field

As shown in the figure, Snyder J. is the most influential researcher in the field, with a total of 505 citations. He is followed by Kenworthy with 359 citations and Crooks with 303. These findings highlight the leading scholars in terms of academic impact within the literature on medical crowdfunding in the health domain.

The results of the analysis, identifying the most influential and the most-cited authors based on the publications within the dataset, are presented below.

Figure 7: Most Cited Authors Within the Dataset
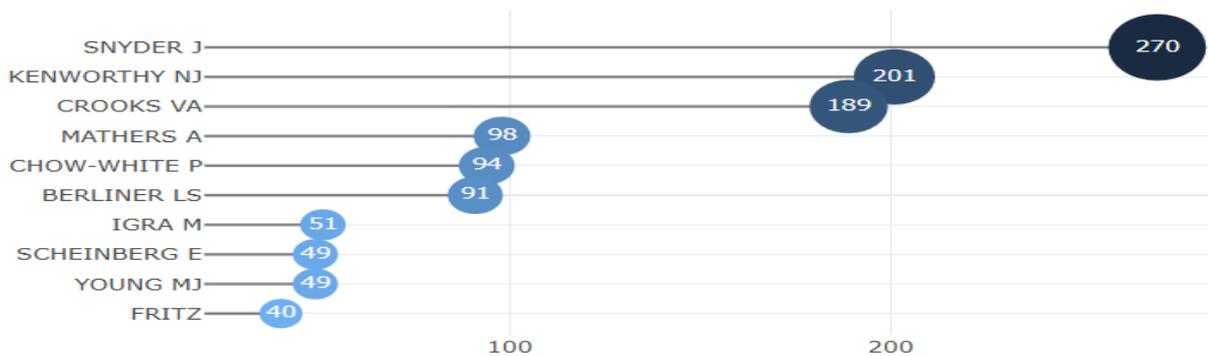
As the figure indicates, Snyder J. once again emerges as the most cited author within the dataset. He is followed by Kenworthy N.J., Crooks V.A., and Mathers. These results show the top ten most influential authors in the medical crowdfunding literature.

The number of publications of the 10 authors with the highest number of publications by years and the analysis of the number of citations received by these publications are presented below.

Figure 8: Annual Distribution of Publications and Citation Intensity by Author


In the figure, the size of the circles represents the number of publications by an author in a given year, while the depth of the colour shade indicates the total number of citations these publications have received in subsequent years.

According to the data analysed, it is observed that Snyder, J. has been publishing regularly every year since 2016. However, the publication with the highest mean number of citations is the study co-authored by Kenworthy, N.J. and Breyer, L.S. in 2016. This study stands out in the literature with a mean of 17.56 citations per year.

Snyder, J., the most prolific author in the field, was most active in 2019. In that year, the author published six studies. These studies have since received a mean of 13.71 citations per year. However, the author's publications with the highest mean citation rate were two studies from 2016, which received an average of 14.5 annual citations.

In addition, the figure below illustrates the most prolific institutions on this subject.

Figure 9: Institutions with the Highest Number of Publications
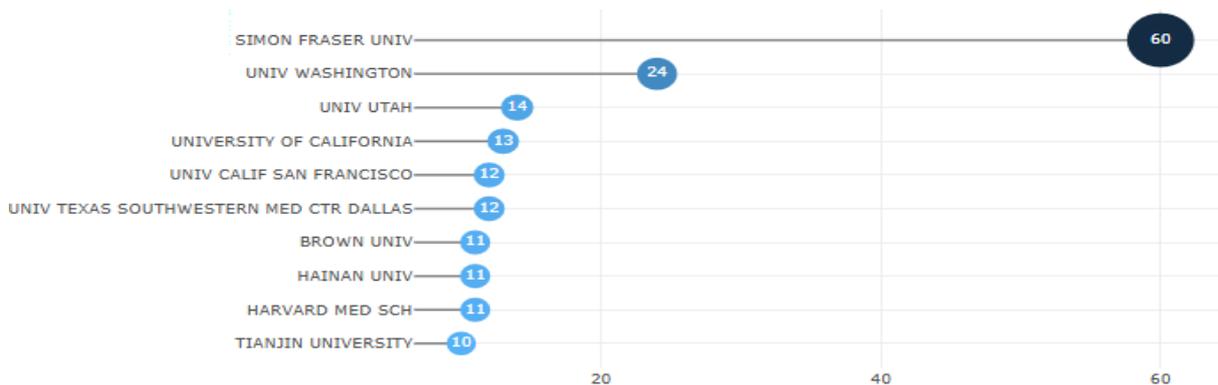
As shown in the figure, Simon Fraser University in Canada is the leading institution, with a total of 60 publications. It is followed by the University of Washington with 24 publications, the University of Utah with 14, and the University of California with 13. A closer examination reveals that Simon Fraser University began its research activities in this area as early as 2015, whereas the other institutions started publishing on the topic primarily in 2018 and 2019.

The Sankey diagram below presents an evaluation of the 10 most contributory authors on the subject, broken down by country and institution. The diagram visualises the interaction network between the authors' scientific outputs and their respective countries and institutions.

Figure 10: Most Influential Authors and Country-Institution Impact Network (Sankey Diagram)
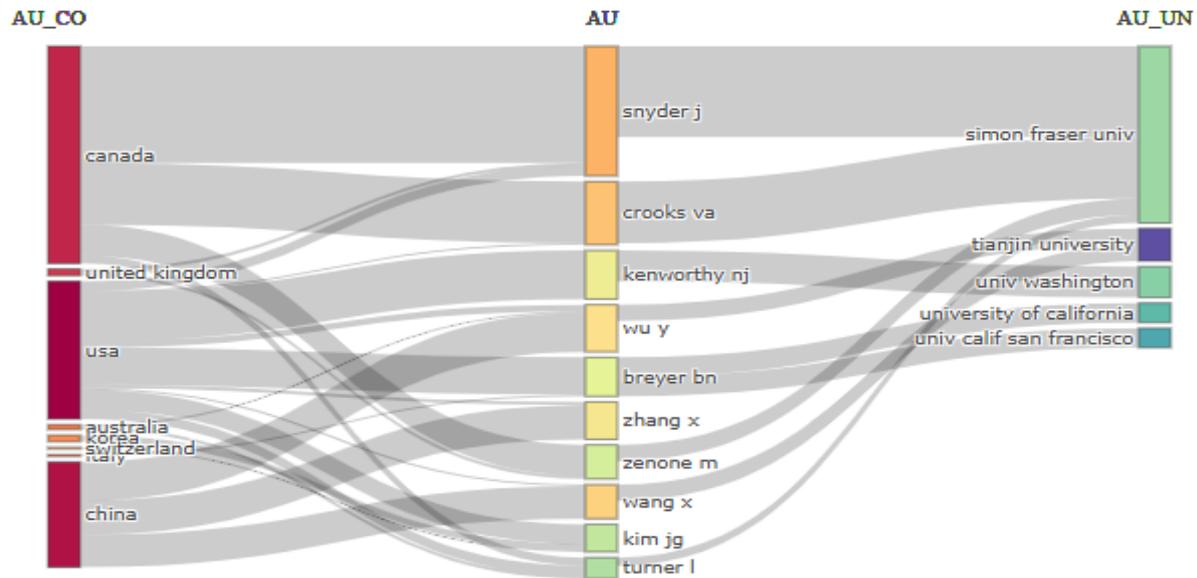
The analysis identifies the most influential authors as Snyder, Crooks, Kenworthy, Wu, Breyer, Zhang, Zenone, Wang, and Kim. When examining the distribution of these authors by country, Canada emerges as the top contributor, followed by the United States and China. Canada's leading position in this field is primarily driven by the high volume of research outputs from Simon Fraser University. Additionally, Tianjin University in China and the University of Washington, University of California, and University of California San Francisco in the U.S. have also made notable contributions to this area of study.

When the publications on crowdfunding in the field of health are re-analysed by country, the distribution pattern is presented below. The visualisation provides the opportunity to evaluate publication volume and country impact together.

Figure 11: Leading Countries by Number of Publications and Their Network Relations
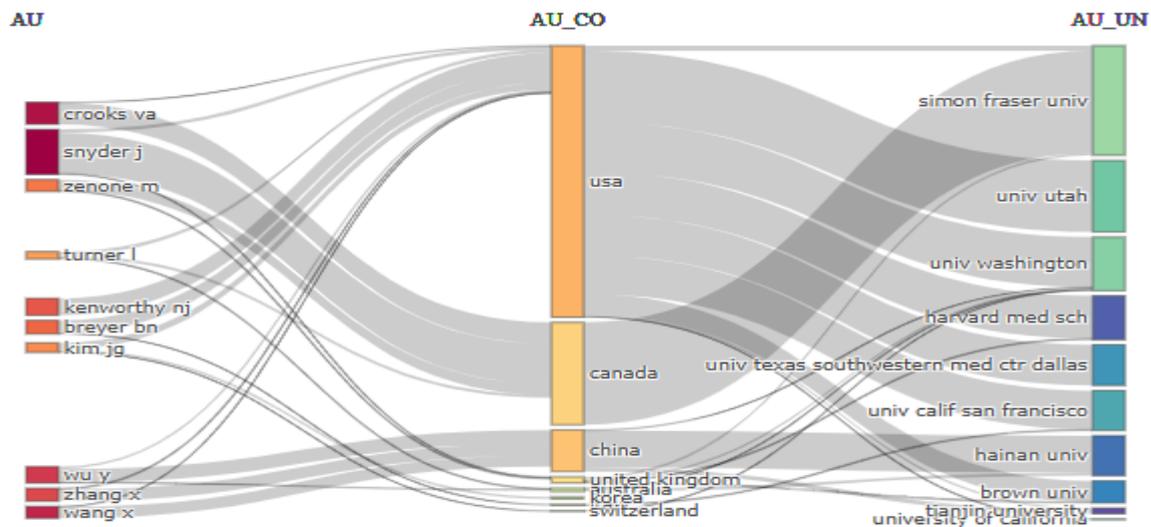

As shown in the figure, the United States clearly stands out as the country with the highest number of publications in this field. It is followed by Canada and China. When examining the internal distribution of

publications, research in the U.S. appears to be carried out by a wide range of authors, whereas in Canada and China, studies tend to be concentrated around specific research groups. In both cases, Simon Fraser University emerges as the key institutional actor reinforcing Canada's leading position in the field.

The figure in which the sources with the highest number of publications on the subject are analysed is given below.

Figure 12: Journals with the Highest Number of Publications
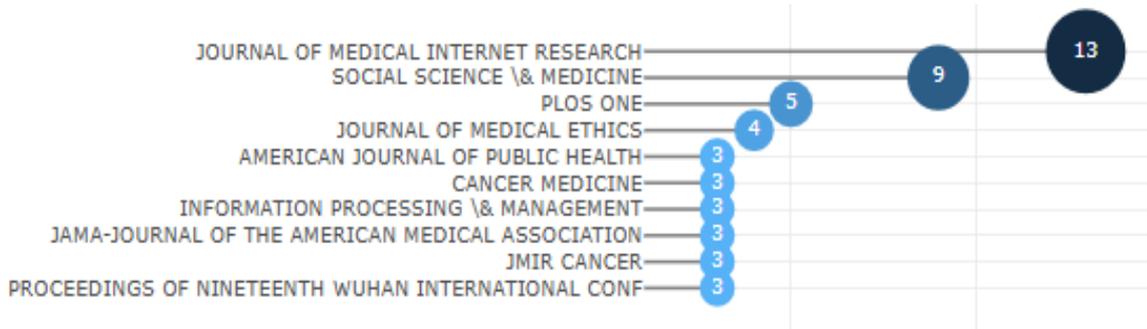
According to the findings, the Journal of Medical Internet Research has published the highest number of articles on medical crowdfunding in the health domain. It is followed by Social Science & Medicine with 9 publications and PLOS ONE with 5. This distribution is significant in that it reflects the interdisciplinary nature of the topic, which is addressed from both health informatics and social science perspectives.

In addition, the visual showing the number of citations received by the studies on the subject among themselves is given below.

**Figure 13:** Most Frequently Cited Sources (Journals)
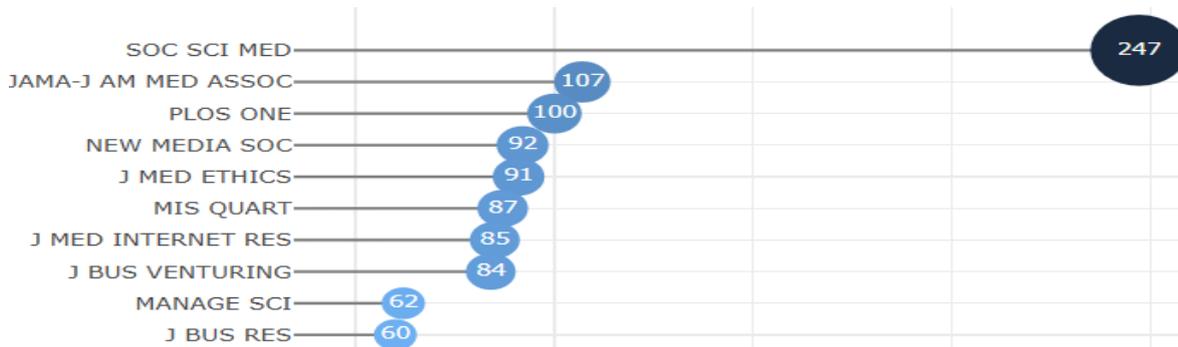
This figure displays the journals that were most frequently cited in the analyzed studies. In other words, it highlights the sources that researchers most often referenced in their own publications.

According to the findings, Social Science & Medicine stands out as the most frequently cited journal, receiving 247 citations. This indicates that, in addition to healthcare-related issues, the social dimensions of crowdfunding are also widely explored in the literature. Social Science & Medicine is followed by JAMA (Journal of the American Medical Association) and PLOS ONE. These results confirm that the research on medical crowdfunding is grounded in an interdisciplinary framework.

As shown in the figure above, the ten most influential journals cited in studies on medical crowdfunding within the dataset have been identified.

The figure 14 presents an analysis of the citation counts received by the individual studies included in the dataset.

Figure 14: Most Cited Studies
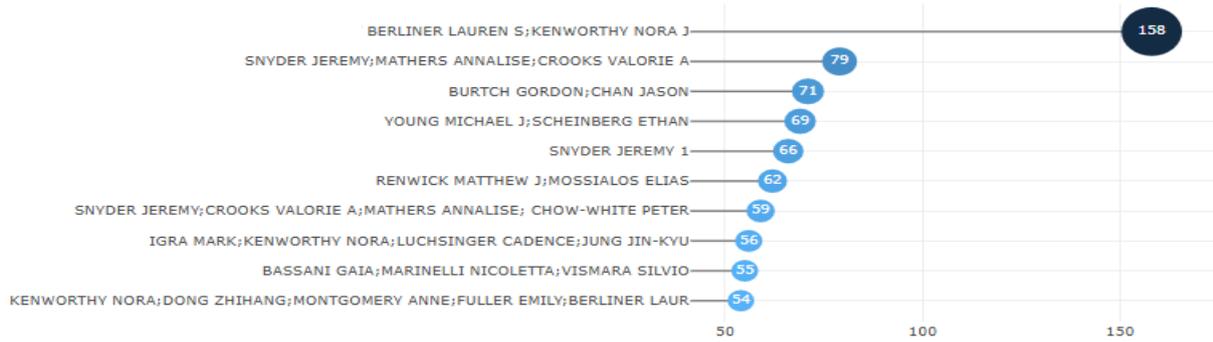
As shown in the figure, the most highly cited study in the field is the article titled *"Producing A Worthy Illness: Personal Crowdfunding Amidst Financial Crisis"* by Berliner et al., published in 2017. This is followed by Snyder et al.'s 2016 publication *"Fund my treatment!: A call for ethics-focused social science research into the use of crowdfunding for medical care"*, and a 2018 study by Burtch and colleagues. These findings suggest that these studies constitute some of the most influential contributions to the medical crowdfunding literature in the health domain.

The table of the most cited studies on this subject is given below.

Table 1: Most Cited Studies

Publication Name	Total Citation	Average Annual Citation
Berliner Lauren S;Kenworthy Nora J	158	17,56
Snyder Jeremy;Mathers Annalise;Crooks Valorie A	79	7,90
Burtch Gordon;Chan Jason	71	10,14
Young Michael J;Scheinberg Ethan	69	7,67
Snyder Jeremy 1	66	6,60
Renwick Matthew J;Mossialos Elias	62	6,89
Snyder Jeremy;Crooks Valorie A;Mathers Annalise; Chow-White Peter	59	6,56
Igra Mark;Kenworthy Nora;Luchsinger Cadence;Jung Jin-Kyu	56	11,20
Bassani Gaia;Marinelli Nicoletta;Vismara Silvio	55	7,86
Kenworthy Nora;Dong Zhihang;Montgomery Anne;Fuller Emily;Berliner Lauren	54	9,00
Paulus Trena M;Roberts Katherine R	53	6,63
Gonzales Amy L;Kwon Elizabeth Y;Lynch Teresa;Fritz; Nicole	51	6,38
Snyder Jeremy;Turner Leigh;Crooks Valorie A	44	5,50
Kim Jennifer G;Kong Ha Kyung;Karahalios Karrie;Fu; Wai-Tat;Hong Hwajung	41	4,10
Ba Zhichao;Zhao Yuxiang (Chris);Song Shijie;Zhu Qinghua 2	40	8,00
Saleh Sameh N;Ajufo Ezimamaka;Lehmann Christoph U; Medford Richard J	39	6,50
Vox Ford;Folkers Kelly Mcbride;Turi Angela;Caplan Arthur; L	36	4,50
Kenworthy Nj	34	4,86
Van Duynhoven Alysha;Lee Anthony;Michel Ross;Snyder; Jeremy;Crooks Valorie;Chow-White Peter;Schuurman Nadine	34	4,86
Wu You;Zhang Xing;Xiao Quan	33	8,25
Barcelos Chris A;Budge Stephanie L	33	4,71
Snyder Jeremy;Chow-White Peter;Crooks Valorie A;Mathers; Annalise	33	3,67
Ren Jie;Raghupathi Viju;Raghupathi Wullianallur	31	5,17
Durand Wesley M;Peters Jillian L;Eltorai Adam E M; Kalagara Saisanjana;Osband Adena J;Daniels Alan H	30	3,75
Jin Pingyue	30	4,29

Source: Created by the author

When the topic is examined in terms of the annual number of citations received by the studies, the following figure is produced.

Figure 15: Average Annual Citation Counts of Studies
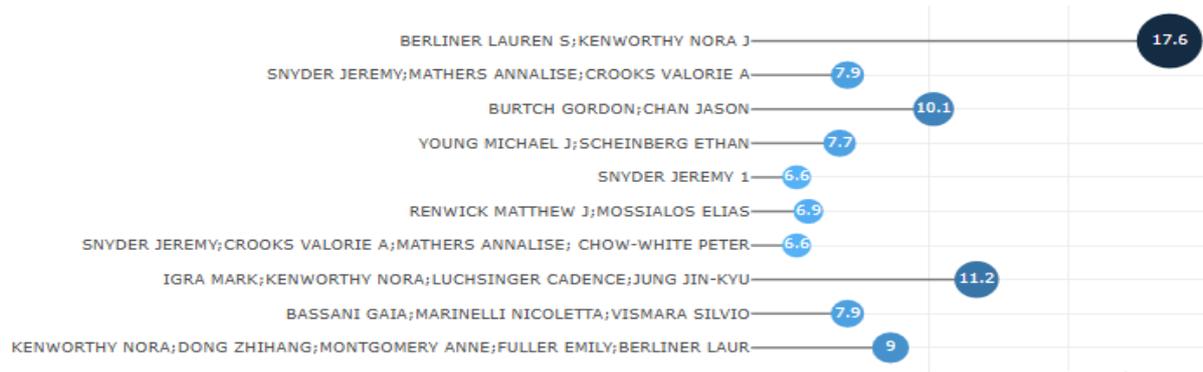
As can be seen from the figure, the study by Berliner et al. has the highest value with an average annual citation of 17.6. It is followed by the 2021 publication by Igra et al., titled *"Crowdfunding as a Response to COVID-19: Increasing Inequities at a Time of Crisis"*, which has an annual average of 11.2 citations. The third most cited on average is the 2018 study by Burtch et al., titled *"Investigating the Relationship Between Medical Crowdfunding and Personal Bankruptcy in the United States: Evidence of a Digital Divide."*

Although the citation counts mentioned above demonstrate the general influence of the respective studies, not all of these citations necessarily pertain directly to the topic of medical crowdfunding in the health sector. Therefore, an analysis that focuses solely on citations exchanged among studies within this specific field provides a more meaningful assessment of their internal impact. In this context, the figure below displays the number of local citations (LC) —that is, citations received from other studies within the same dataset.

Figure 16: Most Locally Cited Studies within the Medical Crowdfunding Literature

As shown in the figure, the most locally cited study within the medical crowdfunding literature is the study by Lauren Berliner. This is followed by studies conducted by Jeremy Snyder and Michael Young. To examine this in greater detail, a table presenting the top locally cited publications is provided below.

Table 2: Top Locally Cited Studies within the Dataset

Study	Yıl	Local Citation
Berliner Lauren S;Kenworthy Nora J	2017	91
Snyder Jeremy;Mathers Annalise;Crooks Valorie A	2016	55
Young Michael J;Scheinberg Ethan	2017	49
Snyder Jeremy	2016	45
Snyder Jeremy;Crooks Valorie A;Mathers Annalise; Chow-White Peter	2017	43
Gonzales Amy L;Kwon Elizabeth Y;Lynch Teresa;Fritz; Nicole	2018	40
Kenworthy Nora;Dong Zhihang;Montgomery Anne;Fuller Emily;Berliner Lauren	2020	37
Paulus Trena M;Roberts Katherine R	2018	31
Bassani Gaia;Marinelli Nicoletta;Vismara Silvio	2019	28
Van Duynhoven Alysha;Lee Anthony;Michel Ross;Snyder; Jeremy;Crooks Valorie;Chow-White Peter;Schuurman Nadine	2019	27

|		
Renwick Matthew J;Mossialos Elias	2017	24
Snyder Jeremy;Chow-White Peter;Crooks Valorie A;Mathers; Annalise	2017	24
Burtch Gordon;Chan Jason	2019	24
Igra Mark;Kenworthy Nora;Luchsinger Cadence;Jung Jin-Kyu	2021	24
Saleh Sameh N;Ajufo Ezimamaka;Lehmann Christoph U; Medford Richard J	2020	22
Kim Jennifer G;Kong Ha Kyung;Karahalios Karrie;Fu; Wai-Tat;Hong Hwajung	2016	21
Durand Wesley M;Peters Jillian L;Eltorai Adam E M; Kalagara Saisanjana;Osband Adena J;Daniels Alan H	2018	21
Vox Ford;Folkers Kelly Mcbride;Turi Angela;Caplan Arthur; L	2018	21
Jin Pingyue	2019	20
Ba Zhichao;Zhao Yuxiang (Chris);Song Shijie;Zhu Qinghua 2	2021	19
Snyder Jeremy;Turner Leigh;Crooks Valorie A	2018	18
Lukk Martin;Schneiderhan Erik;Soares Joanne	2018	18
Kenworthy Nj	2019	18
Ren Jie;Raghupathi Viju;Raghupathi Wullianallur	2020	18
Dressler Gabrielle;Kelly Sarah A	2018	17
Xu Kaibin;Wang Xiaoyu	2020	16
Snyder Jeremy;Zenone Marco;Crooks Valorie;Schuurman; Nadine	2020	15
Kenworthy Nora;Igra Mark	2022	15
Barcelos Chris A;Budge Stephanie L	2019	12

Source: Created by the author

The table displays the most cited publications in the relevant literature. The citation counts indicate both the general scientific impact of the studies (global citations) and its importance within the research area (LC). The study by Berliner and Kenworthy (2017), in particular, stands out for both its visibility in the literature and its thematic contribution, with 91 local and 158 global citations. Furthermore, authors such as Snyder, Crooks, and Kenworthy are among the decisive actors in the literature, with multiple highly cited studies.

Some studies receive a high number of citations only within their specific field, whereas others are cited by a broader scientific community, thus achieving prominence at the global citation level. For instance, the study by Renwick and Mossialos (2017) has had a more extensive impact, with 62 global citations compared to 24 local ones. This indicates that such publications contribute not only to a specific research area but also to interdisciplinary topics like health policy and ethics.

The most-cited study within the field is the 2017 publication titled, *"Producing a Worthy Illness: Personal Crowdfunding Amidst Financial Crisis"*. This is followed by the 2016 publication, *"Fund My Treatment!: A Call for Ethics-Focused Social Science Research into the Use of Crowdfunding for Medical Care"*. In third place is another 2017 study, *"The Rise of Crowdfunding for Medical Care: Promises and Perils"*. This table reveals the most influential local sources in the literature on crowdfunding in healthcare. A word cloud based on the frequency of keywords used in the analyzed studies is presented below.

**Figure 17:** Keyword Frequency Visualization (Word Cloud)
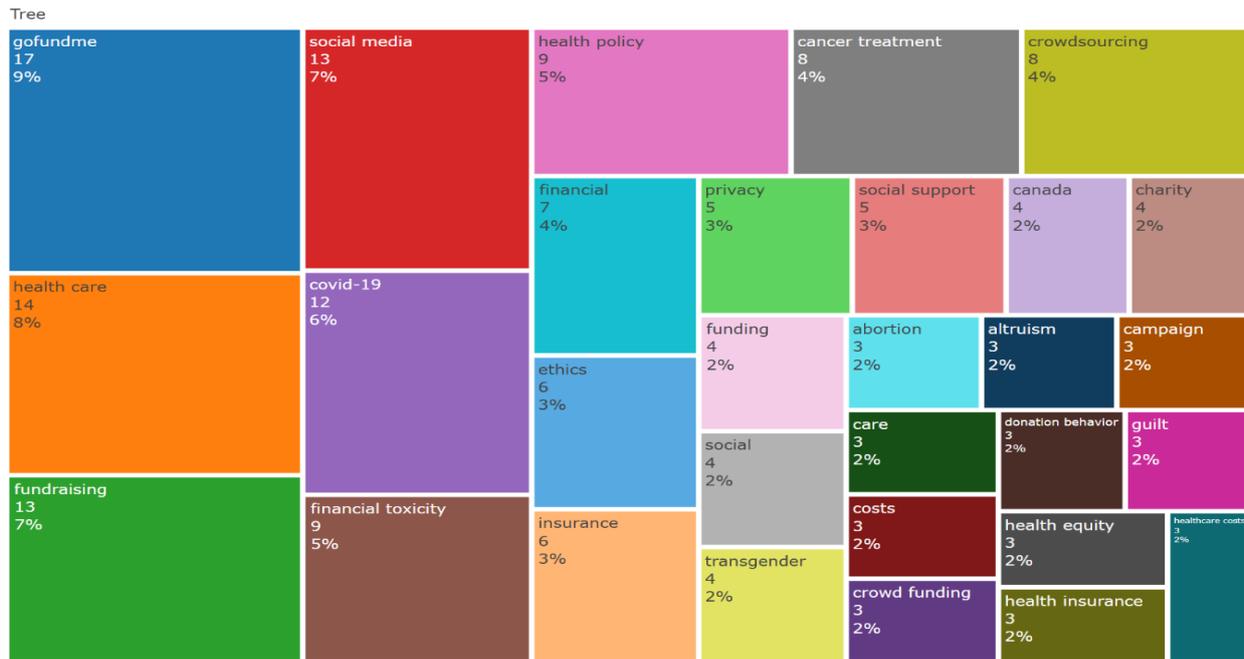
The dataset consists entirely of studies focused on medical crowdfunding in the health domain; thus, all publications inherently share this thematic focus. For this reason, keywords such as *"health,"* *"crowdfunding,"* and *"medical crowdfunding"* were excluded from the keyword frequency analysis, as they are intrinsic to the scope of the study. In addition, semantically identical but orthographically varied terms (e.g., *"healthcare"* vs. *"health care"*) as well as singular–plural variations (e.g., "*campaign*" vs. "*campaigns*") were grouped together under unified categories. After this refinement, the resulting keyword pool revealed that approximately 9% of the keywords were related to GoFundMe, a globally active crowdfunding platform.

In addition, the literature is seen to address a wide variety of topics, such as healthcare services, fundraising, the role of social media in donation campaigns, COVID-19, financial toxicity, health policy, social support, insurance, cancer treatment, and abortion.

A keyword co-occurrence network was constructed based on the keywords used in the analyzed studies. This analysis utilized the keywords provided by the authors. As previously noted, semantically similar terms were merged, but no keywords were excluded from the analysis. The Walktrap clustering algorithm and the association normalization method were applied during the analysis. The resulting findings are presented below.

Figure 18: Keyword Co-occurrence Network
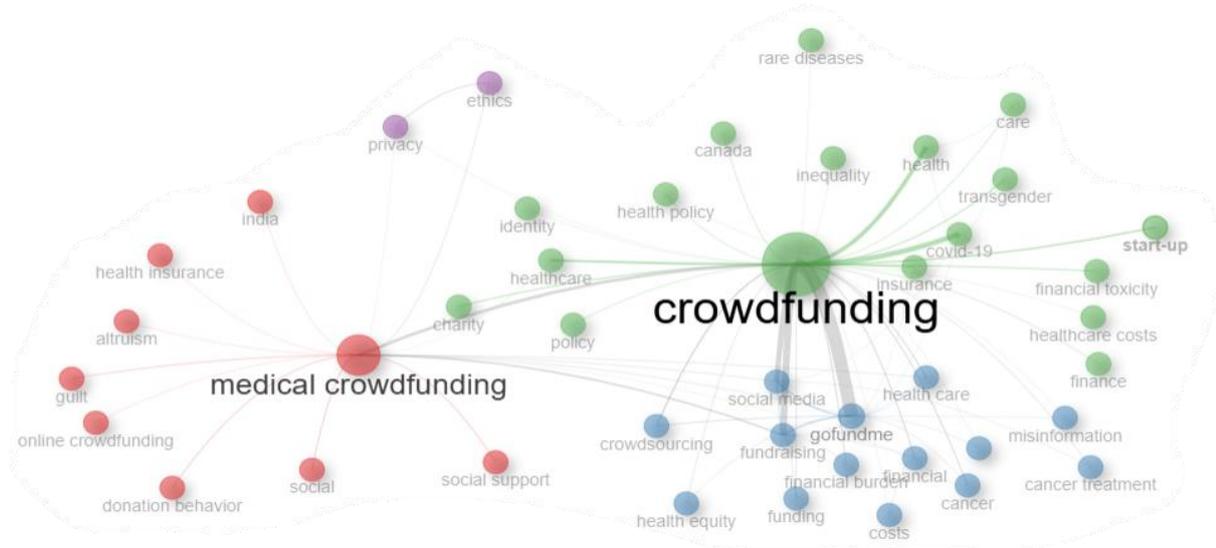
As shown in the figure, the keywords "*crowdfunding*" and "*medical crowdfunding*" are the most frequently used and are positioned at the center of the network, representing the core themes of the studies. The red nodes surrounding "medical crowdfunding" indicate prominent subthemes associated with this concept. These include terms such as;

- *altruism*,
- *guilt*,
- *health insurance*,
- *donation behaviour*,
- *online crowdfunding*,
- *social support*,
- *ethics* and *privacy*

Additionally, country-specific contexts such as India are also present. This structure reveals that medical crowdfunding is a multidimensional phenomenon that encompasses not only financial aspects but also ethical, emotional, and social dimensions.

The keyword "crowdfunding," which represents a broader concept, is linked to system-level themes related to healthcare, as indicated by the green nodes. This cluster includes terms such as *health*, *health policy*, *healthcare*, *insurance*, *care*, *COVID-19*, *transgender*, *inequality*, *rare diseases*, *financial toxicity*, and *healthcare costs*. These associations suggest that the analyzed studies largely focus on health-related dimensions of crowdfunding.

The blue nodes represent process-oriented and administrative concepts. This group contains keywords such as;

- *gofundme, social media, fundraising, funding*
- *crowdsourcing, misinformation*
- *financial burden, health equity*

These terms highlight the operational dynamics, challenges, and opportunities encountered within the crowdfunding process.

Finally, the purple nodes point to more abstract, normative concerns such as *ethics* and *privacy*. Notably, the *GoFundMe* platform emerges as a highly connected node in the network, with a betweenness centrality of 24.37 and a PageRank score of 0.074, underscoring its role as the most widely used tool for medical crowdfunding.

Taken together, these keyword relationships demonstrate that medical crowdfunding is not merely a financial tool, but rather a complex and multilayered phenomenon with ethical, psychological, cultural, and technological dimensions.

The conceptual structure can be summarized as follows:

- *Crowdfunding*: Broad and political
- *Medical Crowdfunding*: Specific and emotional
- *Platforms (e.g., GoFundMe)*: Operational level
- *Ethics and Privacy*: Normative dimension

The results of the thematic map analysis, constructed using author-provided keywords, are presented below. This analysis visualizes the main research themes, emerging trends, and the relationships between thematic clusters within the literature. The corresponding findings are illustrated in Figure 19.

Figure 19: Thematic Map Based on Author Keywords
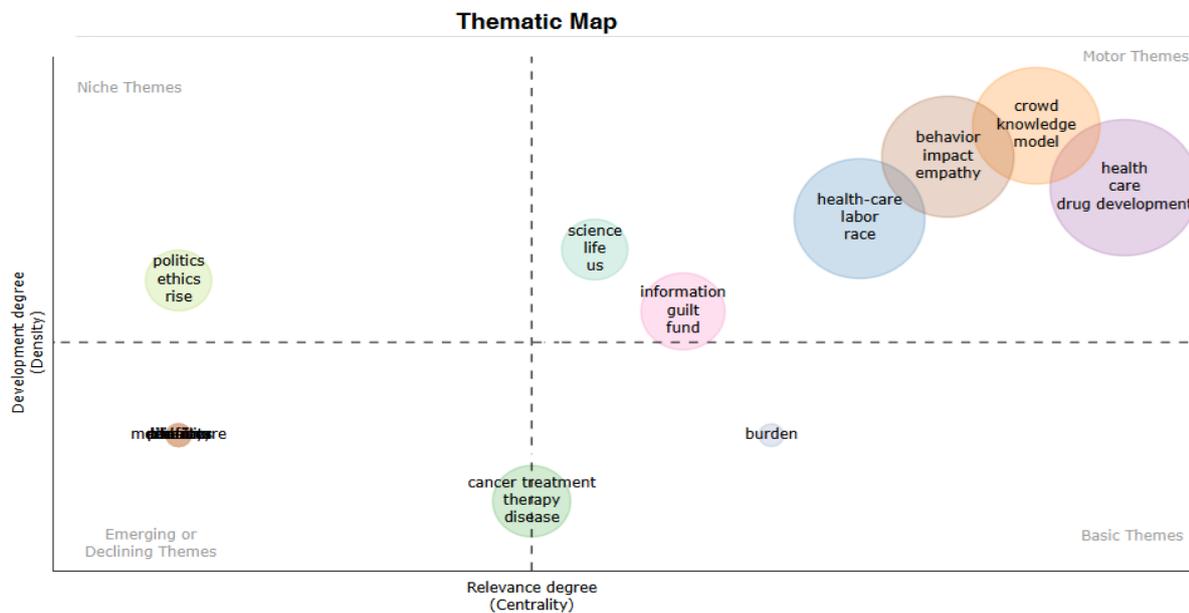
As shown in the figure above, the studies are classified into four thematic groups:

1. **Motor Themes** – High centrality + High density: These themes are both conceptually central and well-developed. They represent the "core" topics of the research field.
2. **Basic Themes** – High centrality + Low density: These themes hold central importance within the literature but remain underdeveloped or still evolving. They often indicate areas with high research potential.
3. **Niche Themes** – Low centrality + High density: These topics are well-defined and extensively studied, yet they are only weakly connected to the broader literature. Their impact remains localized.
4. **Emerging or Declining Themes** – Low centrality + Low density: These represent marginal clusters, either underexplored or losing relevance within the academic discourse.

This classification reveals both the thematic significance of the topics in the research area and their positions based on network analysis.

Motor Themes

A total of 15 main thematic clusters were identified within this category. In particular, the clusters labeled "health," "behavior," "crowd," and "health-care" stand out due to their high Callon centrality and density scores. For example, the "health" cluster exhibits a centrality of 7.682 and a density of 77.898, making it the

most dominant area in the literature. Similarly, the "crowd" (4.267; 80.436) and "behavior" (3.041; 79.509) clusters reflect strong thematic structures with a focus on behavioural analyses.

Basic Themes

Clusters such as "information" (centrality: 0.478; density: 55.000) and "cancer treatment" (0.233; 45.556) are moderately central and carry meaningful thematic depth. They are considered as developing themes with the potential for further exploration and scholarly attention.

Niche Themes

Themes such as "science," "politics," "charity," "platform," "tourism," and "burden" show low centrality but, in some cases, relatively high density. For instance, the "politics" cluster has a density value of 55.556, indicating strong internal cohesion despite its limited connectivity to other areas of the literature. These are considered niche themes and may offer valuable contributions through in-depth, focused research.

Emerging or Declining Themes

Clusters labelled "disability," "medical care," "decisions," "platform," and "tourism" exhibit low values in both centrality and density. This suggests that these topics are either underrepresented in the current literature or are gradually losing relevance.

When the subject is evaluated in terms of its intellectual structure through co-citation network analysis, the resulting network of the 40 most co-cited studies is illustrated in the map below.

Figure 20: Co-citation Network Analysis
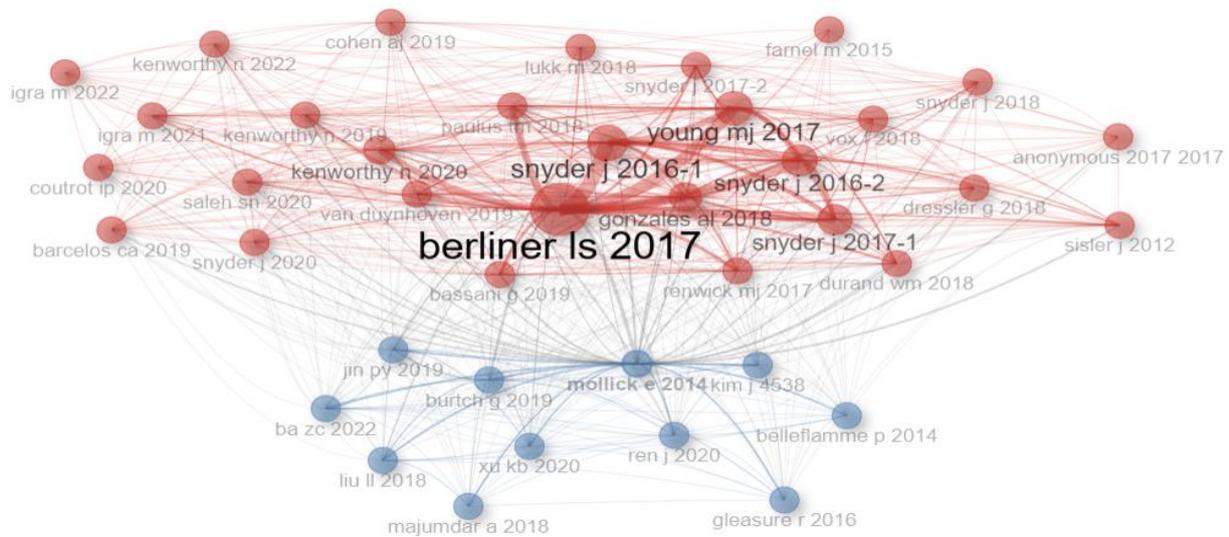
According to the results of the co-citation network analysis conducted on studies in the healthcare field, two main clusters have been identified within the network structure. These are as follows:

Cluster 1: Ethics, Social Justice, and Critical Approaches in Health

Represented in red, this cluster consists of authors who focus primarily on the ethical dimensions of healthcare, social inequalities, critical health policy, and contextual analysis. The most influential work within this cluster is Berliner L.S. (2017), which serves as a major information hub with a betweenness centrality score of 53.190. Additionally, it holds a PageRank score of 0.076, making it one of the most influential publications in the entire network. These metrics highlight the author's central role in facilitating knowledge flow both within and across clusters.

The studies of Snyder, J. (2016-1, 2016-2, 2017-1, 2017-2, 2018, 2020) reveal that the author has made regular and continuous contributions to the subject, thereby establishing connections at numerous points within

the network. The Prolific studies of Snyder's, both has played a significant role in shaping cluster formation and establishing interdisciplinary links between health and ethics.

Furthermore, authors such as Kenworthy, Gonzales, and Paulus have made notable contributions in terms of both closeness and PageRank scores, reinforcing the thematic coherence within the cluster. Overall, this cluster centers on critical health research, social health policy, and themes related to inequality in healthcare.

Cluster 2: Digital Platforms, Campaign Success, and Behavioural Dynamics in Crowdfunding

Represented in blue, this second cluster comprises studies most closely associated with research on medical crowdfunding. While some of the studies originate from different disciplinary backgrounds, they are frequently cited within the literature focused on health-related crowdfunding.

The most central study in this cluster is by Mollick E. (2014). Positioned at the heart of the network, this publication holds a closeness centrality of 0.024 and a PageRank score of 0.027, positioning Mollick as one of the foundational figures in the crowdfunding literature. In addition, studies by Burtch G. (2019) and Ba Z.C. (2022) emerge as strategic nodes in the flow of information within the network.

In addition, the results of the historiographic analysis—including the 15 studies with the highest co-citation links within the dataset—along with the corresponding table, are presented below.

Figure 21: Historiographic Analysis
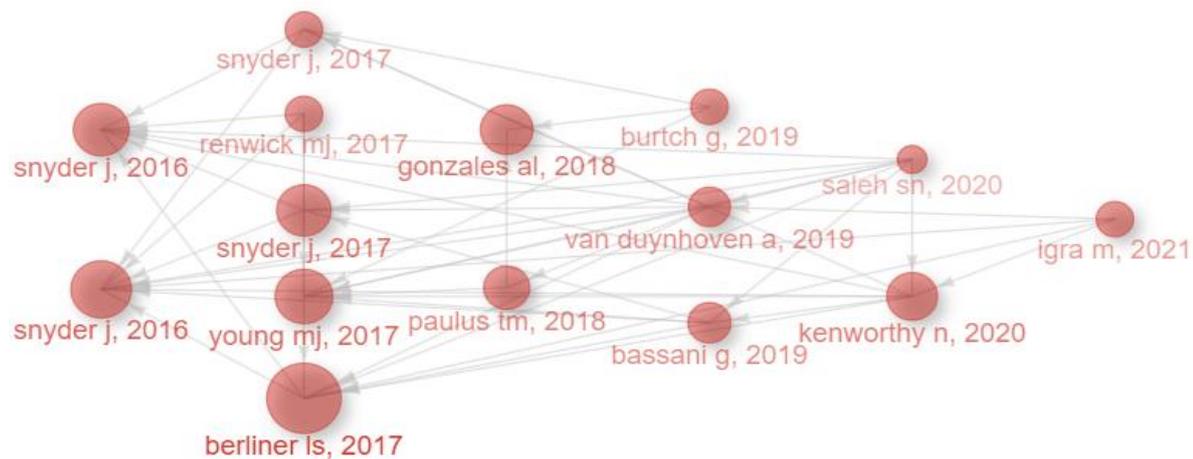
The studies are arranged chronologically from left to right in the figure. The size of each circle represents the number of citations received by the corresponding study, while the arrows indicate citation links between studies. In addition, a table summarising the results of the historiographic analysis is presented below.

Table 3: Historiographic Table of Top-Cited Studies

Year	Author	Article Title (Shortened)	LCS	GCS	Thematic Focus
2016	Snyder J	*Fund My Treatment!*	55	79	Ethics and the Call for Research
2016	Snyder J	*Crowdfunding for Medical Care...*	45	66	New Forms of Finance
2017	Berliner LS	*Producing a Worthy Illness*	91	158	Narrative and 'Deservingness'
2017	Young MJ	*The Rise of Crowdfunding...*	49	69	Political Economy
2017	Snyder J	*Appealing to the Crowd*	43	59	Ethical Justifications
2017	Renwick MJ	*Economic Risks and Benefits*	24	62	Health Economics
2017	Snyder J	*Widening the Gap*	24	33	Emphasis on Inequality
2018	Gonzales AL	*Support, Privacy, and Identity*	40	51	Privacy and Identity
2018	Paulus TM	*Worthy Bodies in Narratives*	31	53	Narrative Analysis

Year	Author	Article Title (Shortened)	LCS	GCS	Thematic Focus
2019	Bassani G	*Crowdfunding in Healthcare*	28	55	Healthcare Systems
2019	Burtch G	*Bankruptcy and Digital Divide*	24	71	Digital Divide
2019	Van Duynhoven A	*Socioeconomic Status and Canada*	27	34	Spatial Inequality
2020	Kenworthy N	*Social Inequities in the US*	37	54	Social Inequality
2020	Saleh SN	*Canada, UK, and US Comparison*	22	39	Comparative Analysis
2021	Igra M	*COVID-19 and Inequities*	24	56	Inequality in Times of Crisis

LCS: Local Citation Score; GCS: Global Citation Score

Source: Created by the author

Table 3 reflects the developmental trajectory of the academic literature on medical crowdfunding beginning in 2016. During the initial phase (2016–2017), the literature focused predominantly on ethical concerns, narrative structures, and representations of "deservingness." In subsequent years, the scope expanded to include themes such as socio-economic dimensions, digital inequalities, and spatial disparities. From 2020 onwards, comparative analyses and the impacts of global crises—particularly the COVID-19 pandemic—became central to scholarly inquiry. It is noteworthy that the studies with the highest citation and impact scores appear to be pivotal in shaping conceptual shifts and new directions in the literature. In this respect, the table reveals the thematic evolution of the field and illustrates its transformation over time through key publications.

- **2016–2017**: In the early phase of the literature, Snyder's studies contributed to shaping the ethical, social science-oriented, and healthcare financing axes of the field. During the same period, authors such as Berliner and Young deepened the conceptual framework by focusing on notions of "deservingness" and narrative structures.
- **2018–2019**: This period saw a shift towards themes such as public perception, privacy, body politics, and economic/technological inequalities. New dimensions emerged, including the digital divide (Burtch, 2019) and spatial disparities (Van Duynhoven, 2019).
- **Post-2020**: With the outbreak of the COVID-19 pandemic, the literature entered a new phase marked by analyses of exacerbated inequalities during times of crisis (Igra, 2021), cross-country comparisons (Saleh, 2020), and class-based perspectives. This period particularly features an increase in quantitative data analysis and policy-oriented recommendations.

Overall, studies with high LCS (Local Citation Score) and GCS (Global Citation Score) are recognised as core references in the literature on medical crowdfunding. Research in this area predominantly concentrates on ethical issues, social inequality, and health system structures.

In addition to these findings, collaboration network analyses were conducted to examine the social structure of the field, focusing on the relationships among authors, institutions, and countries. Only studies with at least two collaborative links were included in the analysis, and the Walktrap clustering algorithm was employed. The resulting visualisation of the author collaboration network is presented below.

Figure 22: Co-authorship Network Analysis
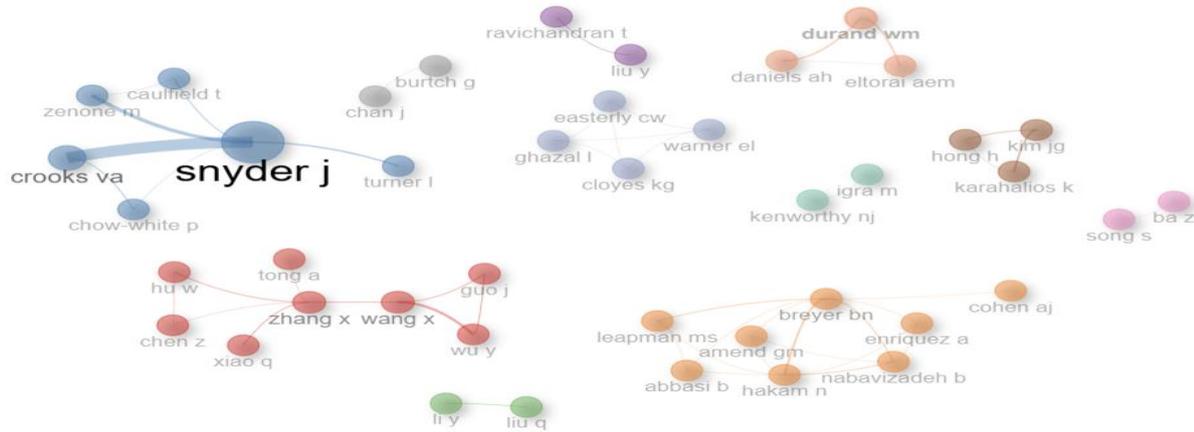
As a result of the network analysis, the authors were classified into eleven distinct clusters. The first and second clusters form the core of the network due to their inclusion of a high number of central authors. In particular, Zhang X., Snyder J., and Breyer B.N. hold both bridging and influential positions within the literature, as indicated by their high *betweenness* and *PageRank* values. The high *betweenness* score of Zhang X. reveals that this author acts as a bridge in the flow of information between clusters. Snyder J., on the other hand, stands out with high *closeness* and *PageRank* values, indicating a strong direct influence and a position close to the centre of the network.

The authors in the remaining clusters generally exhibit low centrality values and are positioned at the periphery of the network. This indicates that these researchers have relatively limited interaction and citation potential within the literature. The findings indicate that the literature on medical crowdfunding is concentrated around specific researchers, and that some authors have taken on formative roles in shaping the field.

The visual output of the institutional collaboration network analysis, based on author affiliations, is presented below.

**Figure 23:** Institutional Collaboration Network
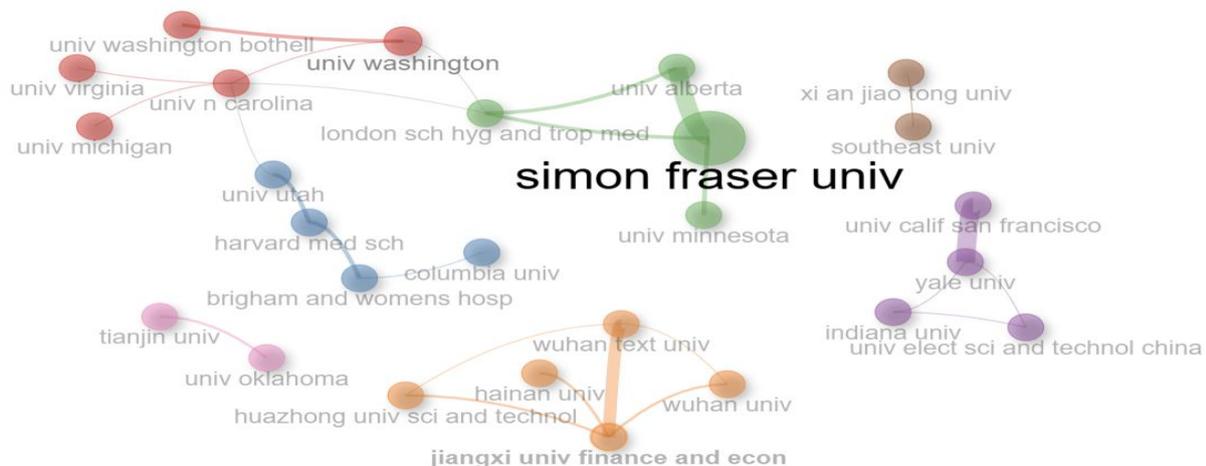
The centrality indicators from the institutional collaboration network examined in this study reveal that certain universities occupy structurally central positions in the field of medical crowdfunding research. In particular, **Simon Fraser University** stands out as an influential and frequently referenced node in the network, with a high PageRank score (0.065). The institution's visibility is strengthened by its productive researchers and its connections to various clusters within the network.

Similarly, **Jiangxi University of Finance and Economics** is notable for its high PageRank (0.069) and closeness centrality value (0.25). This indicates that the institution holds a strategic position in terms of access to information. **The University of North Carolina**, on the other hand, has the highest betweenness centrality score (45), highlighting its role as a bridging institution between clusters and as a key factor in maintaining the structural cohesion of the network.

Overall, the findings suggest that institutional collaborations in the field of medical crowdfunding tend to concentrate around specific universities, while some institutions play a leading role in establishing interdisciplinary connections.

When the analysis is considered in the context of countries, the visual for the country collaboration network analysis is presented below.

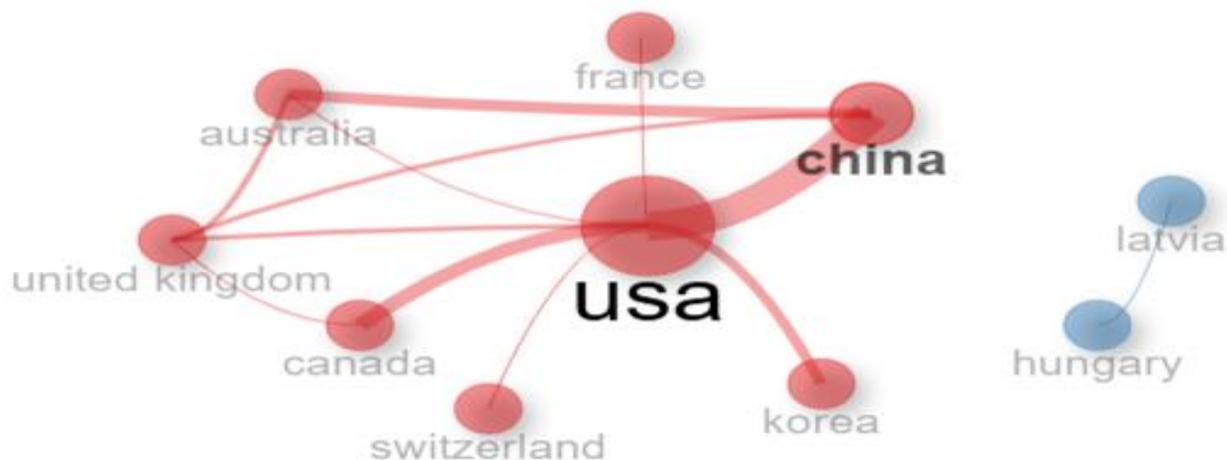**Figure 24:** Country Collaboration Network (Minimum One Link)
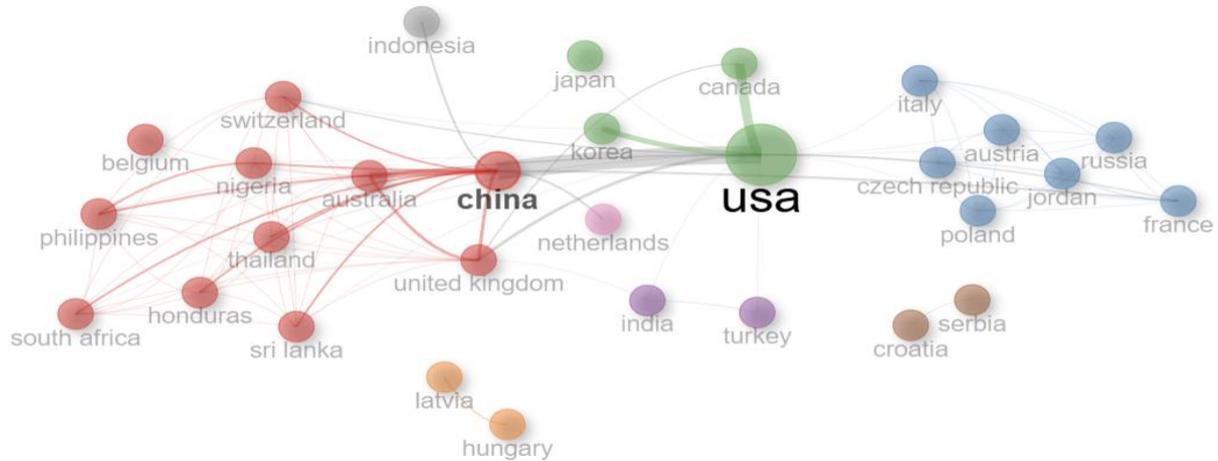
In the country-level collaboration network analysis conducted within the scope of this study, the **United States (USA)** clearly emerges as the most central actor in the network, with the highest *betweenness centrality* (170.052) and *PageRank* score (0.129). These high centrality measures indicate that the USA functions as a focal hub for global collaborations in medical crowdfunding research. This position reflects both the productivity of US-based research institutions and their extensive international partnerships.

China ranks as the second most central country, with a *betweenness* score of 50.325 and a *PageRank* of 0.077. This suggests that China has gained a strategically important position within the network, largely due to its increasing volume of publications and its expanding international collaborations in recent years.

The **United Kingdom** and **Australia** also stand out with high *PageRank* and *betweenness* scores, assuming important bridging roles in the flow of scholarly information. In contrast, countries such as **Canada**, despite exhibiting lower *betweenness* scores, show relatively strong *PageRank* values, indicating more localised but still influential clusters of research activity.

Some smaller countries with high *closeness centrality*—such as **Serbia**, **Croatia**, and **Hungary**—have fewer overall connections but are able to reach the centre of the network via shorter paths. This demonstrates the strategic position of regionally focused collaborations in facilitating access to knowledge.

Overall, the analysis shows that research on medical crowdfunding is clustered around a few central countries; however, it also reveals that a diverse range of actors from different regions can play meaningful roles in accessing and contributing to the global scholarly network.

Figure 25: Country Collaboration Network Analysis (At Least Two Links)

In the two separate country-level collaboration network analyses, simply increasing the *Minimum Number of Edges* parameter from 1 to 2 led to marked differences in the structural characteristics of the network. In both scenarios, the **United States (USA)** remained by far the most central actor, with the highest *betweenness centrality* (16.522 and 170.052), *closeness centrality* (0.143 and 0.036), and *PageRank* (0.269 and 0.129). This consistency highlights the robustness of the USA's international academic collaboration network, both in terms of direct and indirect connections.

When the minimum edge threshold was increased to 2, the network became more condensed, retaining only countries engaged in more intensive collaborative relationships. Consequently, some countries—such as **India**, **Türkiye**, and **Indonesia**—were excluded from the network, while the centrality scores of the remaining countries rose. For instance, **China's PageRank** increased from 0.077 to 0.133, and that of the **United Kingdom** from 0.061 to 0.106. These increases reflect the greater prominence of countries bound by stronger ties.

This comparison clearly demonstrates how network analysis parameters influence structural interpretations. Raising the minimum number of links enables the identification of only stronger collaborations, thereby amplifying the visibility of countries occupying core positions within the network.

5. Conclusion

This study systematically analysed 222 academic publications on medical crowdfunding in healthcare services between 2014 and 2024 using bibliometric and visual mapping techniques, based on data retrieved from the Web of Science and Scopus databases. The findings indicate that academic production in this field has gained strong momentum over the past decade, with a marked increase following the COVID-19 pandemic—reflected in an annual growth rate of 44.61%.

The analysis identified authors such as *Snyder* (27 publications, 505 citations), *Crooks, Kenworthy*, and *Berliner*, as well as institutions including *Simon Fraser University, Washington University*, and *Jiangxi University*, as prominent in terms of productivity and network centrality. At the country level, the *United States* emerged as the central actor in the global scientific collaboration network, with the highest *betweenness centrality* (170.052) and *PageRank* (0.129) scores.

The co-occurrence and *co-citation* analyses of keywords revealed that the literature is structured around two main conceptual axes: the first is a critical approach focusing on ethics, social justice, and health policy; the second comprises applied studies concerning digital platforms, user behaviour, and campaign success. This dual structure highlights the interdisciplinary nature of the field, encompassing both normative and practical dimensions.

Thematic mapping and *historiographic analyses* indicated that core themes such as *health*, *behaviour*, and *crowd* form the conceptual backbone of the literature, while themes like *cancer treatment*, *tourism*, *financial toxicity*,

and *information* represent emerging or niche areas of inquiry. Over time, the literature has undergone thematic evolution: whereas the 2016–2017 period focused on narratives of "deservingness" and ethical dilemmas, the post-2020 period has increasingly addressed issues such as digital inequalities, spatial disparities, and structural vulnerabilities deepened by the COVID-19 crisis.

Collaboration network analyses at the author, institutional, and country levels revealed that knowledge production is concentrated within specific academic centres, and that certain actors maintain the structural integrity of the network by serving as bridges between clusters. Notably, scholars such as *Snyder, Zhang*, and *Breyer*, along with institutions like *Simon Fraser University* and the *University of North Carolina*, stood out for their high centrality values.

Taken together, these findings demonstrate that medical crowdfunding is not merely a form of individual assistance, but a multilayered phenomenon that reflects systemic inequalities, ethical tensions, and processes of digital transformation in healthcare systems. As such, crowdfunding has evolved into a research domain that critically examines the relationship between financing tools and social justice, calling for renewed attention in social policy.

The main limitation of this study lies in its focus on English-language publications and reliance on the Web of Science and Scopus databases. Furthermore, due to the nature of bibliometric analysis, content-based and contextual interpretations were limited. Future research could address these limitations by incorporating multilingual datasets, platform-based micro-level data (e.g. campaign narratives, donor profiles), and qualitative content analysis supported by multidisciplinary approaches.

In conclusion, this study offers a systematic roadmap for researchers working in the field of medical crowdfunding by mapping the literature at conceptual, structural, and methodological levels. It also provides a data-driven framework for policymakers seeking to develop ethical and equitable models of healthcare financing.

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