Visualising the scientific landscape of global research in self-compassion: A bibliometric analysis

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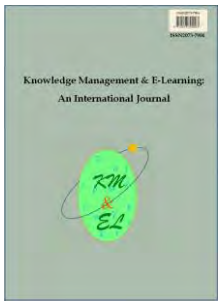

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Visualising the scientific landscape of global research in self-compassion: A bibliometric analysis

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Abstract: Research in self-compassion has rapidly increased. Providing a comprehension of the scientific knowledge landscape will be helpful for researchers to identify the gaps and develop future research ideas in this field without subjectivity. Thus, overarching structures in self-compassion Scopus-indexed research were sought to be analysed here. Bibliometric techniques were used to extract documents indexed in Scopus under the domain of self-compassion (N = 1,764 articles) using bibliophily, a web interface of the Bibliometrix 3.0 and VOSviewer to conduct analysis and visualisation. The number of published articles shows an upward trend; the United States occupies the leading position in publication volumes and citations. Undoubtedly, K. D. Neff and her sustained cited model were reported as a prolific author and influential article in self-compassion literature. The top affiliation was the University of Texas at Austin, which was the leading university in both production and citation. Mindfulness was a key journal that was considered in publication volume and received citations; however, authors trended to publish from diverse selected sources. The top 50 most frequently used terms were related to individual differences and psychological status. Finally, the thematic mapping provided a comprehensive illustration showing significant themes and knowledge gaps in self-compassion research, which categorised individual differences as basic, measurement validation as niche and PTSD as emerging themes. The current findings presented scientific mappings and extensive tables containing information that usefully proposes future directions and the critical broader scope of research in self-compassion.

Keywords: Self-compassion; Bibliometric analysis; Science mapping

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1. Introduction

Scientific interest in mindfulness and self-compassion studies has increased drastically over the past decades. Under the umbrella of mindfulness, scholars have developed the concept of self-compassion, integrating Buddhist philosophies with Western psychological approaches (Bluth & Neff, 2018). In order to understand the self-compassion is, it is a helpful strategy for dealing with upsetting thoughts and feelings that promotes mental and physical wellness. It may be considered compassion for the experience of suffering directed inward. Self-compassion is how we treat ourselves when we feel like a failure, inadequate, or are experiencing personal sorrow. Self-compassion may take on a loving, caring shape, mainly when it is intended to promote self-acceptance or ease uncomfortable feelings (Neff, 2023). There is evidence that its expanded concepts toward interventions have positive benefits on various groups of populations, including adults and children, across a wide range of psychological outcomes.

As of 2017, there were 2,986 published articles in AMRA, PsycINFO, PubMed, Scopus as well as Web of Science (WoS) (Goldberg et al., 2017), and according to the review results of Swami, Andersen & Furnham (2021), over 60% of all studies related to self-compassion in the WoS database have been published since 2018 and 80% since 2016. Although most of the articles on self-compassion were published in the last five years, research trends in this field are still continually increasing. Self-compassion has rapidly expanded not only from psychology to other social sciences areas but also medical and other clinical areas. MacBeth and Gumley (2012) found that there are currently over 720 articles related to self-compassion and psychopathology in EMBASE, MEDLINE and PsycINFO databases. Furthermore, this collection of research has, generally speaking, focused on a wide range of subjects, including connections with well-being and self-esteem, health- as well as body image-related outcomes, social relationships, developmental trajectories and use in clinical and interventional contexts. Researchers and psychologists are increasingly becoming interested in techniques to improve self-compassion as the body of research showing the positive effects of self-compassion grows. With numerous studies on self-compassion literature, visualising scientific comprehensive mappings on big-load research can be beneficial. Therefore, this study bridges the gap using bibliometric analysis to create knowledge mappings that the existing traditional systematic review cannot provide.

2. Literature review

2.1. A brief review of self-compassion in research

The models of (self) compassion were proposed by many scholars, especially Neff (2003) and Gilbert (2009). These two models explain kindness and empathy toward one's self, although Gilbert's model specifically emphasises physiological and neurological approaches to compassion, while that of Neff focuses on healthy attitudes. For understanding the phenomenology and manifestation of self-compassion, its models are currently viewed as useful concepts complementing explanatory frameworks (MacBeth & Gumley, 2012). However, self-compassion refers to individuals' healthy ways of using it while they are suffering in hardship times, failures, or difficulties in their lives. Individuals with a self-compassion mindset, represent the balancing between their reduced uncompassionate and increased compassionate responses to their struggles. According to

Neff's model (2003), the six components of self-compassion include increased self-kindness, common humanity, mindfulness, reduced self-judgement, isolation and overidentification (Kristin et al., 2021). As the significant outcomes, previous studies and reviews showed the relationships between self-compassion and healthy outcomes, well-being and reduced psychopathology (Crego et al., 2022; Saroinsong et al., 2021; Winders et al., 2020).

With the increasing volume and diversity of research on self-compassion, scholars may find it difficult to explore the overall perspective. While systematic reviews and meta-analyses are useful and significant, particularly for synthesising conceptualisations of self-compassion, several researchers have been concerned about the limitation of reviews for creative and holistic consideration from immersing knowledge into specialised topics (Aria & Cuccurullo, 2017; Barnard & Curry, 2011). Researchers can better understand how seemingly unrelated topics are interrelated by using bibliometric mappings that provide a scientific knowledge-based broader scope on self-compassion (Ball, 2017; Cañas et al., 2023; Swami et al., 2021).

2.2. Self-compassion in bibliometric studies

Bibliometrics is widely used to be a source of scientific mapping in visualising a large and controversial research stream. A few bibliometric reviews on self-compassion involving Swami et al. (2021) have pointed to a broader picture of self-compassion research in WoS. The keywords co-occurrence, co-citation and network centrality analysis were used to describe the knowledge base and volume of self-compassion research. The overarching themes in the self-compassion literature included mental health and well-being, clinical results, self-perceptions as well as physical health and family concerns. Khawda et al. (2023) conducted a bibliometric analysis of the Scopus database to examine knowledge-based clusters. Five clusters were examined, including psychological aspects, individual differences, adolescents, and their self-concept, emotional and coping behaviour and study methods.

2.3. The present study

According to previous studies, it seemed that most studies were published as original articles by using various research methodologies. In the review methodology, the traditional method is still preferred, which tends to be constrained in their specific conceptual framework, approach, or scope of certain research questions. However, there was a limitation in these studies, which did not explain the overview research. As a result, we used bibliometric network analysis to present an overview of the current studies related to self-compassion. To extend the work of Khawada et al. (2023), the current study conducted a bibliometric review of the prior literature related to self-compassion in Scopus to provide a comprehensive scientific landscape of self-compassion research. The findings from the analysis would highlight the frontiers in self-compassion research. Specifically, the following research questions (RQs) are addressed:

RQ1: What is the general information and growth of publications related to self-compassion?

RQ2: Which are the productive authors, institutes and countries in publications in this research field?

RQ3: What are the popular topics and sources among researchers in this research field?

RQ4: What is the collection of high-impact published papers in this research field?

RQ5: What is the gap in the research related to self-compassion?

3. Method

According to Börner et al. (2003), there are five stages in the procedure for science mapping: 1) study design, 2) data collection, 3) data analysis, 4) data visualisation and 5) interpretation, which was placed together with the discussion. Therefore, to define the study design as the first stage, this study was a literature-based descriptive study involving bibliometric analysis, which is a robust methodology used in many fields. It enables the systematisation of scientific production on an issue by rigorously making sense of vast amounts of unstructured data (Donthu et al., 2021).

3.1. Data collection

A bibliometrics analysis can be conducted using data from various databases, including WoS, Scopus, Google Scholar, Microsoft Academic and Dimensions, which are the five main bibliographic databases. However, the two most frequently used for bibliometrics analyses are the WoS and Scopus, due to their largest abstract indexed database (Boonroungrut et al., 2022) and greater coverage of document sources than other databases. Thus, to extend the previous studies that already analysed the self-compassion publications from WoS, the Scopus database was used for the data collection stage in this study (Mongeon & Paul-Hus, 2016; Moral-Muñoz et al., 2020).

The three sub-step methods of the data collection stage were applied to control the quality of data as an input source (Le Thi Thu et al., 2021). The following information was provided for each step:

Step 1: Data collection. The raw data and syntax of this search tool were received from the Scopus database (https://www.scopus.com) through the advanced search options for entering search keywords and the appropriate operator searching condition by subject area, language used and time span. According to previous research, keyword searching for the Boolean search technique is limited to searching only article titles as "TITLE" ("self-compassion*" OR "self-compassion*") was conducted. This study included all publication years that were indexed up to 23 September 2022. Document types were limited to English documents in social sciences, psychology, and medicine & healthcare domains. The row data was exported to two different formats, CSV (comma-separated values) and BIB (Biblomeric) data files.

Step 2: Data filtering. The row data from the previous step was filtered to remove the records that were not related to self-compassion. This step eliminated other materials that were not for academic purposes. Journal articles, review articles, book and other academic articles were targeted in this process. The data filtering was processed with a refined result tool provided by Scopus.

Step 3: Data cleaning. Several errors were corrected in this step because the quality of the analysis depends on the quality of the data. For example, "self-compassion" and "self compassion" or "self-esteem" and "self esteem" were considered the same term. In

addition, plural forms and determiners made several terms different, for example, "cross-sectional study" and "cross-sectional studies" or "University of Texas at Austin" and "the University of Texas at Austin." Notably, the authors' keywords were considered the same term when calculating frequency. The stage results are presented in Table 1.

Table 1
Result of data collection stage

Query strings	TITLE ("self-compassion*" OR "self compassion*")
Data collection	1,812 raw data records
Data filtering	48 removed records
Data cleaning	1,764 collected records

Note. Data was collected from the Scopus database (http://www.scopus.com), accessed on September 23, 2022

3.2. Data analysis

The samples were analysed by Biblioshiny for Bibliometrix, a web-based R-programme (Derviş, 2019), and VOSviewer software (Perianes-Rodriguez et al., 2016) because these two were the most well-known and effective bibliometrics analysis tools, but they provided different analysis and supported different data file formats. The data samples from the collection of publications have been extracted using various analysis techniques.

The annual number of publications was analysed and general information from the publication collection was summarised to determine the growth of this research field. This study period was divided into two sub-periods: from 2007 to 2015 and from 2016 to the present to compare the development in each sub-period, The number of publications and citations contributed by each author, institute and nation were analysed to determine who or which ones were the most productive top 5 researchers in this field. Additionally, information for the journal index was obtained from the Scopus website and the Scimago Journal & Country Rank (https://www.scimagojr.com) concerning the most active journals that publish research on self-compassion. The three-field plot was adopted for the visualisation of their relationship.

However, to explore the research gap, the thematic map (or strategic diagram) visualises the analysed data based on the density and centrality of the KeyWords Plus, semi-automated algorithm-defined keywords, and then maps them to topological regions. According to Callon's density and centrality measures, the centrality represents the relevance of the topic, and the density indicates how the topic is developed following quantitative terms (Cobo et al., 2011; Della Corte et al., 2021). However, a thematic map can identify four different types of themes based on the quadrant in which each topic is located. The theme in the upper-right quadrant is thought to be an established and important theme for the research field since it exhibits high centrality and high density. Theme located in the upper-left quadrant are thought to be exceptionally developed and isolated themes or niche themes because of their low centrality but high-density characteristics. Emerging or declining themes are those that are located in the lower-left quadrant and have a low density and centrality. Themes with a low density but high centrality in the lower-right quadrant are considered the general theme (Della Corte et al., 2021). This analysis can help the researcher identify the possibility of creating a future study based on current data.

The visualisation bibliometric mapping layout was influenced by the ease of interpretation, which presented the most frequent units. During the preliminary testing,

various occurrence threshold selections were conducted. To prevent possible arbitrariness, any inconsistent mappings were excluded. The author's collaboration network co-authorship map was calculated using a minimum of 10 documents per node, resulting in 33 countries with greater total link strength than all 106 countries. The mapping nodes and their associations were shown using different colour spots and lines to connect them as clusters. The colours of each circle referred to each cluster and association. Furthermore, the thematic map is constructed based on the top 250 keywords. The items shown in the clusters are set to a minimum frequency of 5. The number of representative labels in each theme is set to 0.3 (Pessin et al., 2022).

4. Findings

4.1. General information and growth of publications

The relevant information from the collection in the field of self-compassion is shown in Table 2. The first publication in this field appeared in 2007. There were 1,764 records consisting of the word of "self-compassion". The selected samples included 1,596 articles, 62 reviews, 27 book chapters and others. The samples included articles published by 4,436 authors and co-authors and cited 40,105 times in 12,844 other documents. The number of authors of multi-authored documents accounted for most of the samples at 97.52% with the ratio of co-authors per document being 3.79. The number of authors of single-authored documents accounted for only 2.47%. Most publications accounted for 79.13% received at least one citation from other scholars.

Table 2
The main information of the data samples

Domains	Descriptions	Results
Documents	No. of documents	1,764
	Timespan	2007–2022
	Sources (journals, books etc.)	663
	Average citations per document	22.74
Authors	Authors	4,436
	Authors of single-authored documents	110
	Authors of multi-authored documents	4,326
Research & publication collaboration	Single-authored documents	147
	Documents per author	0.39
	Authors per document	2.51
	Co-authors per documents	3.79
	Collaboration index	2.68
Global citations[a]	> 100	107 (6.07%)
	55 to 100	78 (4.42%)
	1 to 54	1,211 (68.65%)
	0	368 (20.86%)

Note. [a]Citation counted by Scopus other documents

Notably, the annual growth rate of the publication still positively accounted for 34.5% in September 2022. The growth of scientific output related to self-compassion was

separated into two periods: from 2007 to 2015 and from 2016 to the present. The findings showed that the first period had a low publication volume, with 256 publications over nine years (14.51%). In the second period, the number of research on this topic has exponentially increased and over 100 articles have been published each year since 2016. A total of 1,508 publications (85.49%) were published after 2016.

4.2. Productive authors, institutions, and countries in publications

The United States (12.83%), the United Kingdom (4.74%) as well as Canada (4.58%) were the leading countries for authors and co-authors worldwide. Tables 3 and 4 presented the top 5 authors and institutions in terms of productivity based on publications. The productive authors mostly work in the United States and United Kingdom universities. Undoubtedly, K.D. Neff and the University of Texas at Austin (United States) were the leaders in a publication related to self-compassion with a higher number of published articles and citations than others. In addition, the collection of the h-index showed that K. D. Neff got the highest *h*-index score at 27, which means there are 27 publications with at least 27 citations. All of K. D. Neff's articles received citations approximately 20% of the total citations, and publications under the University of Texas at Austin were cited by 1 of 4 other Scopus documents that cited the publication related to self-compassion. The University of Texas at Austin, the University of Coimbra (Universidade de Coimbra and Centro do Investigaço do Nucleo de Estudos e Intervenço Cognitivo-Comportamental) were affiliations with high citations over 1,000 other Scopus documents (see more information about the top 20 productive authors in Appendix I).

Table 3
Top 5 most productive authors based on total publication

Rank	Author	Institution (Country)	Articles	Citations[a]	*h*-index
1	K. D. Neff	University of Texas at Austin (US)	35	7,779	27
2	K. Bluth	University of North Carolina-Chapel Hill (US)	24	796	12
3	Y. Kotera	University of Derby (UK)	23	213	10
3	M. Mantzios	Birmingham City University (UK)	23	548	12
5	A. C. Kelly	University of Waterloo (CA)	20	747	12

Note. [a]Citation counted by total citations

Table 4
Top 5 most productive institutions based on total publication

Rank	Institution (Country)	Articles	Citations[a]
1	University of Texas at Austin (US)	53	3,984
2	University of Coimba (PT)	45	1,325
3	University of Derby (UK)	36	405
4	Mcgill University (CA)	31	544
4	University of North Carolina-Chapel Hill (US)	31	604
5	University of Saskatchewan (CA)	24	418

Note. [a]Citation counted by other Scopus documents; accessed and updated on November 5, 2022

As shown in Table 5, the majority of publications are contributed by corresponding authors from the United States, with more than 400 papers in the database. The remaining countries on the list contribute much less than the United States (less than 200 papers). In

terms of citations, publications from the United States, followed by the United Kingdom and Canada, received the highest number of citations from other Scopus documents. Authors in the top 5 countries list had cooperated with co-authors from the same country declaring higher frequency in SCP (Single Country Publication) than MCP (Multiple Country Publication).

International cooperation networks among worldwide researchers can be interpreted from the size of the nodes, indicating the number of publications, while the thickness of the lines between nodes indicates the strength of collaboration. According to data from the Scopus database, there are 106 countries with authors and co-authors participating in the research in this field. However, after controlling the minimum 10 documents per node, international cooperation to carry out research shows six clusters: 1) the United States' cooperation with other countries such as Canada, China as well as Thailand, 2) the United Kingdom's cooperation with other countries such as Brazil, Chile, Ireland, Japan as well as Spain and 3) the Australia cooperation with other countries such as New Zealand, Poland and Sweden, while the other three clusters as illustrated in yellow, red and violet colours in Fig. 1 were Portugal, Turkey as well as Netherland cooperation.

Table 5
Top 5 most productive countries based on the total publication

Rank	Country	Articles	Citations[a]	Citations[b]	SCP	MCP	MCP ratio
1	USA	417	8,128	16,594	369	48	0.11
2	Canada	150	3,089	4,193	129	21	0.14
3	Australia	136	1,983	2,147	110	26	0.19
4	United Kingdom	133	3,212	3,588	104	29	0.21
5	China	97	927	747	68	29	0.29

Note. [a]Citation counted by other Scopus documents; [b]Citation counted by total citations; SCP: single country publication; MCP; multiple country publication; Appendix II shows the map of global scientific production

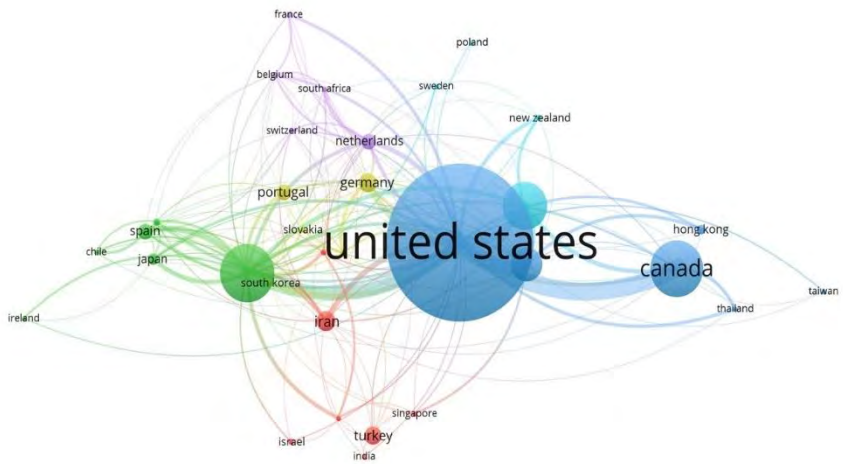

Fig. 1. International cooperation network based on authors' countries

Additionally, the three-field plot based on a Sankey diagram as shown in Fig. 2 represents the relationships among the top 10 affiliations, authors, and countries. It should be apparent that the overwhelming majority of the Scopus-indexed articles within this field were contributed by authors from the United States, Canada as well as the United Kingdom. Likewise, American scholars including the top 3 authors, K. Bluth, K. D. Neff and F. M. Sirois were highly productive. However, K. D. Neff cooperated with authors from outside the United States higher than K. Bluth and F. M. Sirois, especially with scholars from Canada. Also, in the top 10 Ranked universities, Authors from the University of Texas at Austin and the University of North Carolina-Chapel Hill contributed most publications in United States universities. Authors from the University of Saskatchewan and the University of British Columbia contributed most publications to Canadian universities, while authors from the University of Derby contributed most publications to United Kingdom universities.

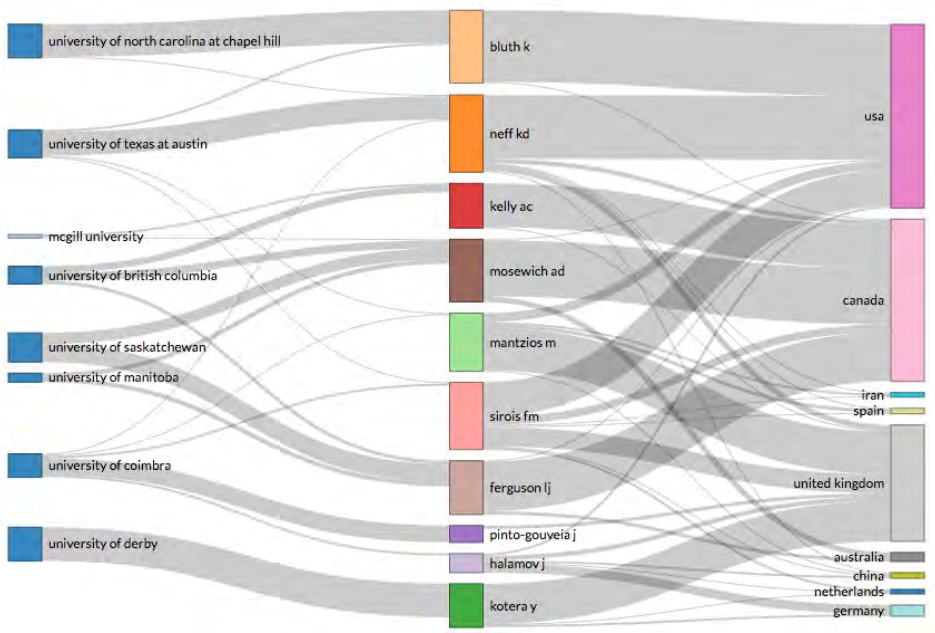

Fig. 2. The three-field plot illustrating the relationship among top affiliations, authors and countries

4.3. Researchers' popular topics and publication sources

In the keyword analysis, a word tree map visualised the 50 most frequently occurring authors' keywords found in Scopus-indexed research. Over 33% of publications contained these 50 terms as shown in Fig. 3. The frequency of human, empathy as well as female terms were used over 1,000 times on average, accounting for 26.89% of all 50 term occurrences. However, the popular terms within this field of research also included adult, male, self-concept, young adult and middle-aged, psychology, adolescent, and depression; the frequency of these mentioned terms was 37.68%. In summary, it can be concluded that

authors always used these terms generally in their research related to individual differences and psychological status.

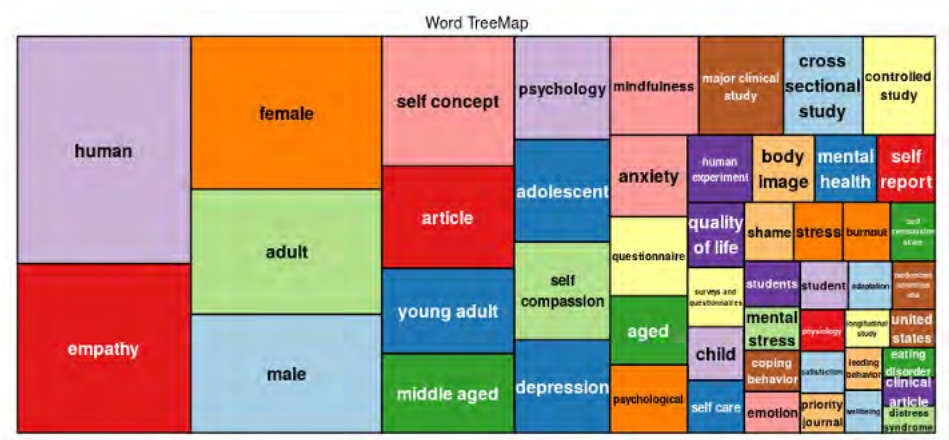

Fig. 3. Treemap visualising the most frequently occurring authors' keywords in self-compassion research

The article publications related to self-compassion, which attracted the most attention from worldwide researchers, were published in Mindfulness (10.71% of all publications), Current Psychology (2.94%), Personality and Individual Differences (2.89%), Frontiers in Psychology (2.60%), and Self and Identity (2.38%). As shown in Table 6, most publications referred to the publication published in Mindfulness (10.17%), following Self and Identity (6.31%), Clinical Psychology and Psychology (4.62%).

Table 6
Top 5 most active and preferable journals

Rank	Journals	Publisher	Articles	Citations[a]	Scopus Quartile	SJR[b]	*h*-index
1	Mindfulness	Springer	189	4,082	Q1	1.25	34
2	Current Psychology	Springer	52	185	Q2	0.51	8
3	Personality and Individual Differences	Elsevier	51	1,604	Q1	1.18	22
4	Frontiers in Psychology	Frontier	46	556	Q1	0.87	16
5	Self and Identity	Tayler & Francis	42	2,533	Q1	1.01	22

Note. [a]Citation counted by total citations; [b]SJR score for 2021 and information from the Scimago Journal & Country website (https://www.scimagojr.com); See the top 20 most preferable journals in Appendix III

4.4. The most influential articles related to self-compassion

The top 5 most cited articles in the collection of these samples are presented in Table 7. The total number of citations of these articles was corresponding to 11.06% of total citations. The citations of these articles have rapidly increased. The average total citations in the last five years were significantly higher than each article's lifetime citations, representing the growth of interest during this period. Most authors were from the United States. Three articles were conducted with the cooperation of K. D. Neff as authors and co-authors. None of them was a single-authored document; however, four of them were single-country publications.

Table 7
Top 5 most cited articles

Rank	Article title	Authors	Citations[a]	Citations[a] per year
1	Construction and factorial validation of a short form of the self-compassion scale	Raes et al. (2011)	1,109	92.41
2	A pilot study and randomised controlled trial of the mindful self-compassion programme	Neff & Germer (2013)	928	92.80
3	Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology	MacBeth & Gumley (2012)	837	76.09
4	Self-compassion and reactions to unpleasant self-relevant events: the implications of treating oneself kindly	Leary et al. (2007)	826	51.62
5	Self-compassion and adaptive psychological functioning	Neff et al. (2007)	743	46.43

Note. [a]Citation counted by total citations; See the top 20 most cited articles in Appendix III

4.5. Identifying the gap in the research related to self-compassion

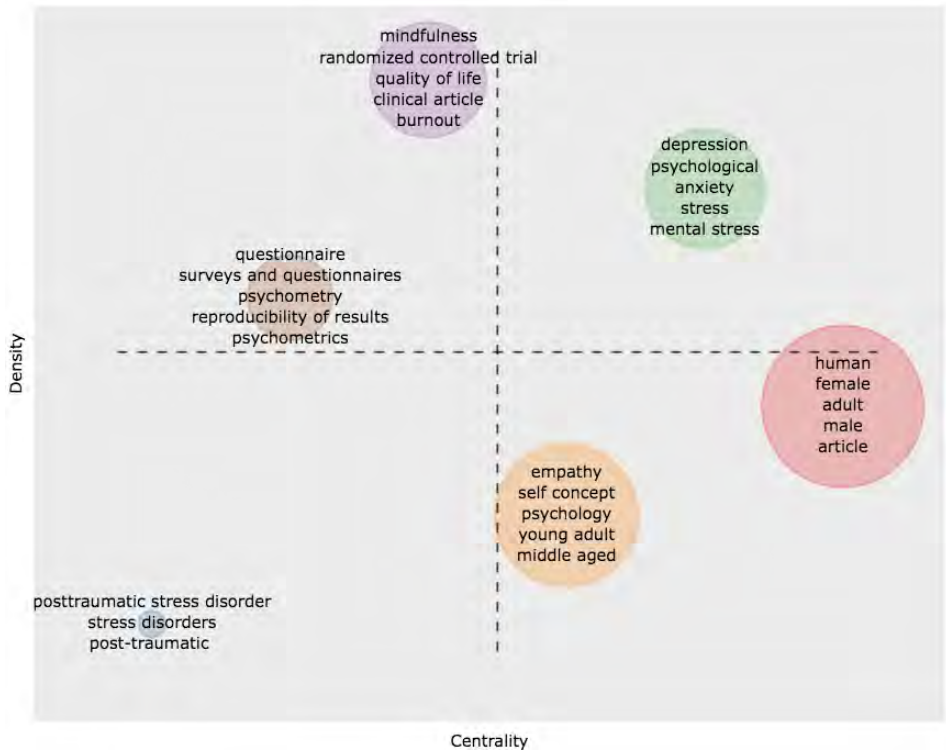

Fig. 4. Treemap visualising the most frequently occurring authors' keywords in self-compassion research

A thematic map was applied for identifying the scientific landscapes based on centrality (*X*-axis) and density (*Y*-axis) on keywords as shown in Fig. 4. The results from each region indicated that: 1) Motor themes (upper-right quadrant): this region contained two observed clusters, which became the main focus for the research field structuring. They included

several terms in psychological factors and mental health including depression, stress, burnout, coping behaviour as well as adaptation. These terms in this region seem to be general with self-compassion because they were already high centrality and density, 2) Niche themes (upper-left quadrant): this region contained terms related to experimental research designs, measures and clinical procedures including psychometrics, factor analysis, follow up, prevention and control. These terms were highly developed, but isolated from unimportant external ties because they are high centrality but low density, 3) Emerging or declining themes (lower-left quadrant): this region contained the terms mostly related to mental disorders, such as PTSD. Within this embryonic state, low in centrality and density, it is observed that most healthcare research emerges interventions creating self-compassion into the patient support context and 4) Basic themes (lower-right quadrant): this region represents low density and high centrality of terms including empathy, self-concept and some psychological issues in adult. Much general research has been done on these themes, so they were transversal in the research area.

5. Discussion

This study attempts to describe the research fronts and visualise knowledge-based scientific mapping from 1,764 self-compassion research in the Scopus database. To address the research question, the number of publications in this field has increased since 2007; however, the publication growth curve sprites within the last five years. In research collaborations, most were contributed by multi-authors who cooperated with other researchers in the same nation. Scholars under United States universities, including K.D. Neff's research team were identified as the most productive and influential authors, institutes and countries within this area. In addition, the collection of publications from the United States and United Kingdom scholars received sustained interest.

Research fronts and present trends were conducted in the same direction as in the Swami et al. (2021) review. The most of self-compassion Scopus-indexed documents were published after 2016 as well as the collection in the WoS databases. Although the concepts of compassion including self-compassion have been introduced since the beginning of the century, it is intriguing how the self-compassion trend has skyrocketed and received attention from worldwide researchers (Kristin et al., 2021). The reason for this could be twofold: first, the number of studies on self-compassion spurred and driven by the finding of strong associations with a variety of positive outcomes (Barnard & Curry, 2011; Bluth & Neff, 2018) and second, The research base has also expanded to encompass various social identification groups, including children and adolescents, various national and linguistic groups as well as those who identify as sexual minorities, in addition to adults from Western countries in the earlier documents (Bluth & Neff, 2018; Neff, 2011).

The studies in the past 15 years were mainly published by the research group from the United States that published more than almost 1.5 times the number of publications compared to the second-ranked country. It is not surprising that K. D. Neff's model of self-compassion became an influential concept that received the most total citations, approximately 20% of all and was cited from other documents. There was much international cooperation to conduct studies with K. D. Neff's cooperation team as the new frontier. Even without her cooperation team, her works still received the highest citations over time. According to the h-index, she played a significant role in establishing and continuing the expansion of the scientific border in this field. While K. D. Neff's self-compassion model has been widely cited as a complementary framework (MacBeth &

Gumley, 2012), the self-compassion assessment named Self-Compassion Scale (SCS) has been increasingly used to assess K. D. Neff's model. Considerably, several meta-analysis reviews provided critical issues on which all kinds of tendencies were reported at the instant of separation between compassion and un-compassion natures. The use of total SCS score can lead to inflation to psychopathology. Using uncompassionate self-responding components was more strongly associated with mental health problems than compassionate self-responding. In addition, it may produce intricate findings for which the total score and separation score are perhaps trivial (Muris & Otgaar, 2020; Muris & Petrocchi, 2017; Yarnell et al., 2015), this idiosyncratic issue may question scholars who implied and cited K. D. Neff's model for reliable measurement constructs.

In general, keyword analysis explored the core authors' interesting topics, where self-compassion research has been consolidated by proportional tree word mapping. The strength and value of this analysis and mapping reside in the capacity to generate a repeatable, metrics-based assessment of self-compassion research; in other words, researcher bias or obliviousness to any "blind spots" in the corpus was not constrained. Observably, the main key terms that appeared in Scopus and WoS were different. Compared to Swami et al. (2021) and Khawada et al. (2023) reviews, several terms that appeared in WoS-indexed documents that were used by authors normally relied on mental health, psychopathology and clinical outcomes; however, terms that appeared in Scopus-indexed documents were established and coalesced around individual differences and psychological well-being componence (Khawda et al., 2023; Swami et al., 2021). According to the source of publication analysis, although Mindfulness accounted for about 10% of all publications as presented in Table 6, over 600 sources accounted for less than 3% each. Additionally, there were 423 journals (63.83% of all sources of publication) that published only one paper related to self-compassion. Thus, it is difficult to identify the main authors' preferable and attractive sources from other researchers.

More practically, the core thematic areas in Fig. 4 can help researchers identify the gap of knowledge in self-compassion to generate new research ideas with the potential to advance the field. Acknowledgement from the thematic analysis encourages interested readers to develop research on topics in the Moto and Niche regions related to psychologically unhealthy variables including stress, depression anxiety and experimental design in clinical settings. To assess and measure self-compassion, psychometric study, questionnaire and clinical research design were also identified in the Niche region. In accordance with Kuhn (1962), as cited in Muris and Otgaar (2020), a paradigm shift may occur from a change in mismeasurement in self-compassion (see also Gu et al., 2020 for SOCS measure). Topics related to individual differences were significant and still more required, while topics related to PTSD are an emerging theme in self-compassion literature, deciding from its growth.

The bibliometric analysis and scientific mappings in this study allow researchers to visualize a vast amount of information-based Scopus corpus to comprehend the scientific landscape with self-compassion and easily discover prospective research in the future. Considerably, since bibliometric analyses depend upon the databases, the result may affect the findings as any change in the database itself. Still, bibliometric review faces several limitations, which include the following: first, the bibliometric review explored the knowledge-based landscape of a corpus and the quality check for an individual article was not conducted as one of the required steps in the traditional review method. Additionally, the thesaurus file among those extracted key terms possibly occurred (Luther et al., 2020; van Eck & Waltman, 2017). Second, only English Self-compassion Scopus-indexed

documents from journals were retrievably included as the data samples. Finally, most results were analysed and involved different algorithms in Bibliometrix software. Unmatched values from Scopus metrics were fractionally detected. As noted by Wang and Zhang (2022), validation can be studied in the future to address the problem of conducting or cross-checking before making the analysis.

As noted in the advancement of the analysis, Bibliometric analysis is a robust tool that may be used, especially in social science and other scientific domains, to first evaluate the impact of scientific work internationally in a transparent, unbiased, and trustworthy manner. Second, using science to map patterns in the fields' structures allows us to detect interdict-planarity and knowledge flows in self-compassion from general to other specialised researchers' interests, such as study on crucial social issues and medicine. In accordance with van Raan (2014), these bibliometric methods have advanced to the point where they are highly reliable, informative, and high-quality instruments in research evaluation practice. These tools include journal indicators, mapping, ranking universities, and advanced application tools for monitoring and assessing the research performance of departments and institutes within universities.

In conclusion, the scientific landscape in self-compassion has expanded rapidly in recent years. Scholars from United States initiations were ranked as the leaders in production. Undoubtedly, the self-compassion conceptualised model of K. D. Neff is declared the most influential in this field. The results from this bibliometric review provide useful information for researchers to identify the gap and point out the areas where new research ideas can advance this field.

Author Statement

The authors declare that there is no conflict of interest.

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Appendix I

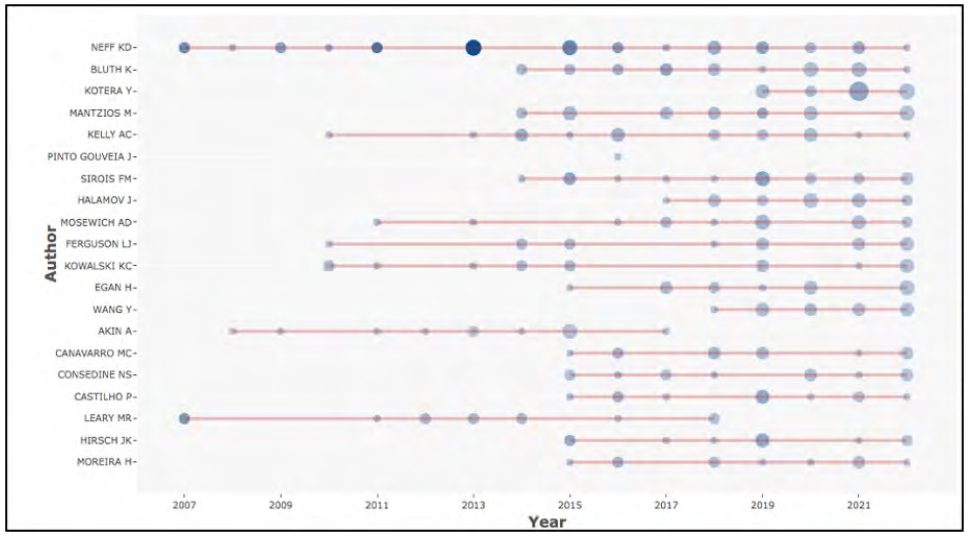

Fig. A1. Top authors' production over time

Table A1
Top 20 authors' publication and citation index

Author	h_index	g_index	m_index	TC	NP	PY_start
NEFF KD	27	35	1.588	7779	35	2007
BLUTH K	12	24	1.200	796	24	2014
KOTERA Y	10	14	2.000	213	23	2019
MANTZIOS M	12	23	1.200	548	23	2014
KELLY AC	12	20	0.857	747	20	2010
PINTO GOUVEIA J	1	1	0.125	51	1	2016
SIROIS FM	11	19	1.100	802	19	2014
HALAMOV J	6	9	0.857	84	17	2017
MOSEWICH AD	9	17	0.692	431	17	2011
FERGUSON LJ	8	16	0.571	331	16	2010
KOWALSKI KC	9	16	0.643	654	16	2010
EGAN H	6	10	0.667	118	15	2015
WANG Y	6	9	1.000	84	13	2018
AKIN A	7	12	0.438	168	13	2008
CANAVARRO MC	9	13	1.000	349	13	2015
CONSEDINE NS	6	13	0.667	250	13	2015
CASTILHO P	7	12	0.778	533	12	2015
LEARY MR	11	12	0.647	1708	12	2007
HIRSCH JK	7	11	0.778	527	11	2015
MOREIRA H	8	11	0.889	323	11	2015

Appendix II

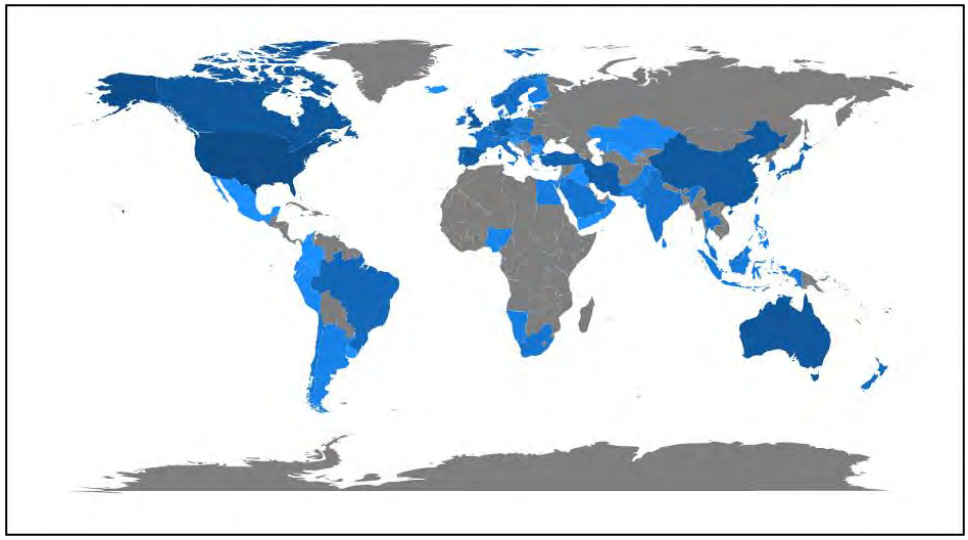

Fig. 1B. The map of global scientific production (color intensity indicates the number of articles published)

Appendix III

Table 1C
Top 20 most preferable journals

Source	h_index	g_index	m_index	TC	NP	PY_start
MINDFULNESS	34	58	2.61538461538462	4082	189	2011
CURRENT PSYCHOLOGY	8	11	1.14285714285714	185	52	2017
PERSONALITY AND INDIVIDUAL DIFFERENCES	22	39	1.57142857142857	1604	51	2010
FRONTIERS IN PSYCHOLOGY	16	22	1.6	556	46	2014
SELF AND IDENTITY	22	42	1.57142857142857	2533	42	2010
BODY IMAGE	18	32	1.5	1071	32	2012
JOURNAL OF CLINICAL PSYCHOLOGY	12	22	1.09090909090909	1782	22	2013
INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	3	5	1	35	21	2021
JOURNAL OF CONTEXTUAL BEHAVIORAL SCIENCE	9	17	0.818181818181818	300	20	2013
CLINICAL PSYCHOLOGY AND PSYCHOTHERAPY	12	19	0.923076923076923	1854	19	2011
JOURNAL OF HEALTH PSYCHOLOGY	8	17	0.8	320	18	2014
PSYCHOLOGY AND PSYCHOTHERAPY: THEORY, RESEARCH AND PRACTICE	7	18	0.5	396	18	2010
PLOS ONE	9	17	1	678	17	2015
CHILD ABUSE AND NEGLECT	8	14	0.615384615384615	415	14	2011
JOURNAL OF CHILD AND FAMILY STUDY	10	14	1	483	14	2014
JOURNAL OF POSITIVE PSYCHOLOGY	8	14	0.571428571428571	716	14	2010
PSYCHOLOGICAL REPORTS	6	10	0.6	104	12	2014
EATING BEHAVIORS	7	11	0.636363636363636	487	11	2013
JOURNAL OF ADOLESCENCE	7	10	0.875	283	10	2016
PSYCHO-ONCOLOGY	7	10	0.636363636363636	284	10	2013

Table 2C
Top 20 most cited articles

Paper	Total Citations	TC per Year
RAES F, 2011, CLIN PSYCHOL PSYCHOTHER	1109	85.3077
NEFF KD, 2013, J CLIN PSYCHOL	928	84.3636
MACBETH A, 2012, CLIN PSYCHOL REV	837	69.7500
LEARY MR, 2007, J PERS SOC PSYCHOL	826	48.5882
NEFF KD, 2007, J RES PERS-a	743	43.7059
NEFF KD, 2007, J RES PERS	574	33.7647
NEFF KD, 2009, J PERS	558	37.2000
NEFF KD, 2010, SELF IDENTITY	467	33.3571
ZESSIN U, 2015, APPL PSYCHOL: HEALTH WELL-BEING	436	48.4444
BARNARD LK, 2011, REV GEN PSYCHOL	412	31.6923
BIRNIE K, 2010, STRESS HEALTH	335	23.9286
NEFF KD, 2011, SOC PERS PSYCHOL COMPASS	327	25.1538
VAN DAM NT, 2011, J ANXIETY DISORD	323	24.8462
NEFF KD, 2016, MINDFULNESS-a	322	40.2500
GERMER CK, 2013, J CLIN PSYCHOL	289	26.2727
RAES F, 2010, PERS INDIVID DIFFER	285	20.3571
BREINES JG, 2012, PERS SOC PSYCHOL BULL	271	22.5833
NEFF KD, 2013, SELF IDENTITY-a	259	23.5455
NEFF KD, 2008, J CROSS-CULT PSYCHOL	250	15.6250
ALBERTSON ER, 2015, MINDFULNESS	237	26.3333