

Publication performance and trends in psychological capital research: a bibliometric analysis

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Abstract

Purpose – This research aims to provide a comprehensive understanding of the evolution and trends in psychological capital (PsyCap) research and related issues.

Design/methodology/approach – This research uses bibliometric analysis. A total of 2,244 journal articles were extracted from the Scopus database using relevant keywords, covering the period from 1997 to 2023. The data analysis was conducted utilizing VOSviewer software, Microsoft Excel, and an online text analysis tool.

Findings – There is a rapid rise in the quantity of PsyCap publications, especially from 2017, with significant contribution of research from Chinese scholars with 577 articles in the period 2019–2023. The antecedents of PsyCap have a stagnation of leadership-related topics and increased focus on social support and perceived organizational support. The attention has been specifically directed toward well-being and mental health, with special emphasis on work engagement, job satisfaction, and job performance.

Research limitations/implications – The exclusion of certain publications in this research may overlook emerging trends. Thus, future research endeavors should adopt a multifaceted approach that combines bibliometric analysis with qualitative and quantitative methods to glean comprehensive insights into PsyCap research.

Originality/value – PsyCap research is growing rapidly, with more publications in the last three years than in all the previous years combined. This study, updating data until the end of 2023, provides the most up-to-date insights on research trends in PsyCap to aid scholars in discerning suitable avenues for their research endeavors.

Keywords Psychological capital, PsyCap, Bibliometric analysis, Research trends, Scopus database, Publication performance, Co-citation analysis, Co-occurrence analysis

Paper type Research paper



1. Introduction

In today's dynamic and ever-evolving business world, organizations face an array of challenges stemming from a volatile, uncertain, complex, and ambiguous (VUCA) environment (Lim, 2023; Maran *et al.*, 2022). One of the critical determinants of success in this environment is the strategic management of resources, both tangible and intangible (Chatterjee *et al.*, 2023). Among these intangible resources, there is a growing awareness of the significance of psychological capital (PsyCap) in shaping the trajectory of modern enterprises (Youssef and Luthans, 2007). PsyCap, a crucial component of positive psychology, can effectively enhance mental and physical health, increasing an individual's competitive advantage and making them more valuable as a strategic resource for sustainable development (Lupsa and Virga, 2020). Therefore, PsyCap research is valuable and significant in a broad sense, contributing to a deeper understanding of the beneficial effects of individual factors and boosting competitive advantage.

The concept of PsyCap was established by Luthans and Youssef (2004), who defined positive it as a new movement that goes beyond traditional economic capital, human capital, and social capital. Traditional economic capital addresses what you have, human capital addresses what you know, social capital expresses whom you know, and positive PsyCap addresses who you are (Luthans and Youssef, 2004). Since then, many investigative studies have been conducted on PsyCap's antecedents (Avey *et al.*, 2011) and consequences (Avey *et al.*, 2011; Luthans *et al.*, 2007). Wu and Nguyen (2019) found that leadership styles and organizational support are key antecedents, while desirable work attitudes are significant outcomes. Castillo and Lopez-Zafra (2022) further emphasized the importance of PsyCap in various work environments, proposing a new classification of its antecedents. Srivastava and Maurya (2017) provided a comprehensive overview of PsyCap, including its individual and organizational-level antecedents and outcomes, and offered preliminary propositions for future research. In addition to creating the PsyCap scale (Luthans *et al.*, 2007), researchers conceptually and empirically developed the PsyCap core construct (Avey *et al.*, 2011), showing how PsyCap affects employee attitude, behavior, and well-being (Avey *et al.*, 2011). PsyCap is a reservoir of positive psychological resources that individuals accumulate and invest in their personal and professional lives. These resources, including hope, optimism, resilience, and self-efficacy, act as the "income" of PsyCap, equipping individuals with the mental tools to overcome challenges, perform better, and maintain their well-being. This positive psychological wealth translates into valuable outcomes, such as enhanced job satisfaction, increased organizational citizenship, more effective leadership, a culture of innovation, and reduced turnover. PsyCap is a dynamic force that not only empowers individuals to thrive in diverse situations but also contributes to the overall success and vitality of organizations. Since then, PsyCap has continued to be a strong topic among researchers globally.

PsyCap is considered an important concept with far-reaching implications for individuals, organizations, as well as society at large. Positive psychological resources including self-efficacy, optimism, resilience, and hope are among them, and PsyCap is associated with improved health, increased job satisfaction, and improved work engagement. Its application spans a wide variety of fields, from business management to healthcare and education, highlighting its versatility and relevance in different contexts.

The objective of this study is to review PsyCap journal articles in the Scopus database from 1997 to 2023, evaluate specific country influence on PsyCap research, and explore the correlation between authors with the same interests. This study uses analytical techniques such as co-citation, text mining, and keyword co-occurrence, supported by modern VOSviewer software, to divide large groups of authors or publications. This helps to identify main topics related to PsyCap, clarify emerging research trends, and outline potential directions for future research. In order to outline the research landscape, we employed

“bibliometric analysis”, using quantitative analysis of empirical data in published literature to study the patterns of publication within a field (Bellis, 2009).

There are a number of comprehensive studies that contribute to our understanding of PsyCap within general social sciences using bibliometric analysis. Goswami and Goswami (2023) conducted a thorough analysis of PsyCap research by utilizing bibliometric techniques and examining 954 articles from the Web of Science (WoS) database, employing content analysis and TCCM analysis. Additionally, Meng *et al.* (2022) examined 2,786 papers related to PsyCap research from 1970 to 2021 to provide insights into knowledge development and mapping paths. The findings from these studies collectively reveal several noteworthy trends in PsyCap research: (1) a substantial increase in the number of publications in the field, indicating its cross-cutting nature; (2) prominent authors predominantly hailing from Australia, the United States, and China; (3) a persistent focus on refining and measuring PsyCap; and (4) key study themes include teamwork, creativity, innovation, and the effects of Covid-19, as well as stress, performance, and well-being, particularly in relation to students, healthcare professionals, and corporate workers. Furthermore, Guerrero-Alcedo *et al.* (2022) conducted a comprehensive Scopus database search through June 27, 2021, analyzing 82 documents published from 2009 to 2021 and highlighted countries prolific in PsyCap research, with China, Australia, the United Kingdom, the United States, and Spain being prominent. Their co-occurrence network analysis emphasized themes related to PsyCap, educational variables, and health in college students. Additionally, Yu and Lin (2020) used VOSviewer information visualization software to analyze 280 core studies from the CSSCI database. The results showed research hotspots related to the benefits of PsyCap for particular groups’ mental health, the function of employee PsyCap in organizational management, the impact of PsyCap on migrant workers’ work attitudes, and the mechanisms of PsyCap in college students. Lastly, Karakuş (2018) focused on PsyCap research between 2003 and 2018, revealing an increasing trend in publications after 2013. Key concepts frequently studied in relation to PsyCap included positive organizational behavior, well-being, work engagement, job satisfaction, authentic leadership, and more. The analysis also highlighted influential journals, institutions, and authors, with the United States playing a significant role.

In addition to studies focusing on specific target groups such as university students (Zhang *et al.*, 2024) or higher education institutions (Guerrero-Alcedo *et al.*, 2022), other studies provide an overview of PsyCap through bibliometric analysis within the scope of our research, including Karakuş (2018), Meng *et al.* (2022), Yu and Lin (2020), Margiadi and Wibowo (2019), and Goswami and Goswami (2023), all utilizing the WoS database and updated data until 2021. Although these studies contribute to a comprehensive understanding of developments and trends in PsyCap research, their data are not sufficiently up-to-date and the Scopus database has not been fully exploited. In this particular case, Scopus is more suitable for the following reasons: first, according to Hallinger and Nguyen (2020), Scopus was selected because the collection of documents for inclusion in its index uses a consistent standard; second, Scopus has more coverage than WoS (Aksnes and Sivertsen, 2019; Hallinger and Chatpinyakoo, 2019; Mongeon and Paul-Hus, 2016). Moreover, in the social sciences and humanities fields, Scopus is more widely used than WoS (Dawkins *et al.*, 2021). Therefore, our study contributes to the body of academic research related to topical PsyCap when updated with data through the end of 2023 (the data in this study indicates that the number of journal article publications on PsyCap in the recent two years, 2022–2023, accounts for 69.9% of the total publications in the preceding years combined) and focuses on the Scopus database that previous comprehensive bibliometric studies on PsyCap have yet to explore.

2. Data sources and methodology

2.1 Data source

Attempts were made to retrieve data from the Scopus database on January 25, 2024. The database is renowned for its comprehensive coverage of scholarly literature, serving as a diverse repository of knowledge, allowing researchers and scholars to access a variety of sources for their endeavors (Baas *et al.*, 2020). This website offers databases and citation information related to the physical sciences, health sciences, social sciences, and life sciences. Elsevier offers Scopus access, but account registration is required. Additionally, searches in the patent database were conducted using Scopus. Our retrieved data certainly contributes to the accumulation of valuable insights and information, serving as a foundational resource for various research activities and academic inquiries.

The search terms “Psychological Capital” or “PsyCap” were used to scan the Scopus database for relevant literature between 1997 and 2023. This comprehensive search yielded a total of 2,578 documents, incorporating 2,244 journal articles (accounting for 87.0% of total documents), 144 conference papers (4.4%), 111 book chapters (4.3%), 60 reviews (2.3%), and some other document types, representing an important body of work around the PsyCap concept. These results certainly provide a background and a solid foundation for researchers and scholars interested in exploring the multifaceted dimensions of PsyCap. For the purpose of this study, the focus was placed on the journal articles, representing the most frequent document type in the dataset, providing a comprehensive overview of the evolving landscape of PsyCap research.

Figure 1 illustrates the comprehensive process of article selection and refinement. Even though the current study doesn't fit into the categories of a systematic review or meta-analysis, it was considered suitable to adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses PRISMA approach (Anguera, 2023).

2.2 Methodology

The method used for our research is bibliometric analysis utilizing VOSviewer 1.6.20, Microsoft Excel 2022, and text analysis using an online text analysis tool.

In the modern context, bibliometric analysis has become essential for scientific research collaboration between institutions (Skute *et al.*, 2017), evaluating and analyzing researchers' publications (Ellegaard and Wallin, 2015), assessing the impact of science investment on national R&D productivity (Fabregat-Aibar *et al.*, 2019), and determining academic quality (Raan, 1999). Bibliometrics involve the analysis of published data, including peer-reviewed journal articles, books, conference proceedings, periodicals, reviews, reports, and related documents, using statistical techniques. It is often used to quantitatively demonstrate relationships between fields of study, examining pertinent publications to understand the development of research fields and the structure of knowledge (Farinha *et al.*, 2015). Bibliometric analysis supports the objective systematization of research results and quantitatively determines research trends by calculating the frequency of specific keywords in publications in prestigious journals or patents. Based on objectively predicted results, it can identify emerging research topics and help researchers save time with data collection and conduct longitudinal research by aggregating published articles within a timeframe (Vogel and Guttel, 2013). By analyzing core content, bibliometric analysis provides an overview of research and illustrates relationships between research concepts, inspiring new ideas and research problems and helps researchers understand core knowledge of a field of study, its subfields, and related areas. Based on this understanding, research trends are analyzed to propose new research programs or structures (Small, 2016).

In our bibliometric method, the VOSviewer software was employed for analyzing authors' co-citation and keyword co-occurrence and Microsoft Excel was used to compile the

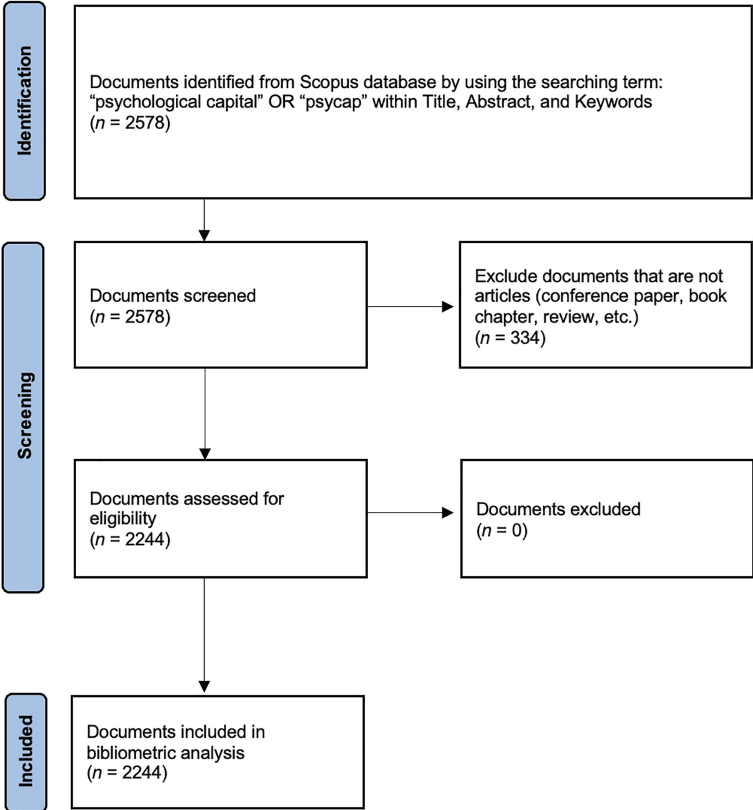


Figure 1.
PRISMA

Source(s): Figure by the authors

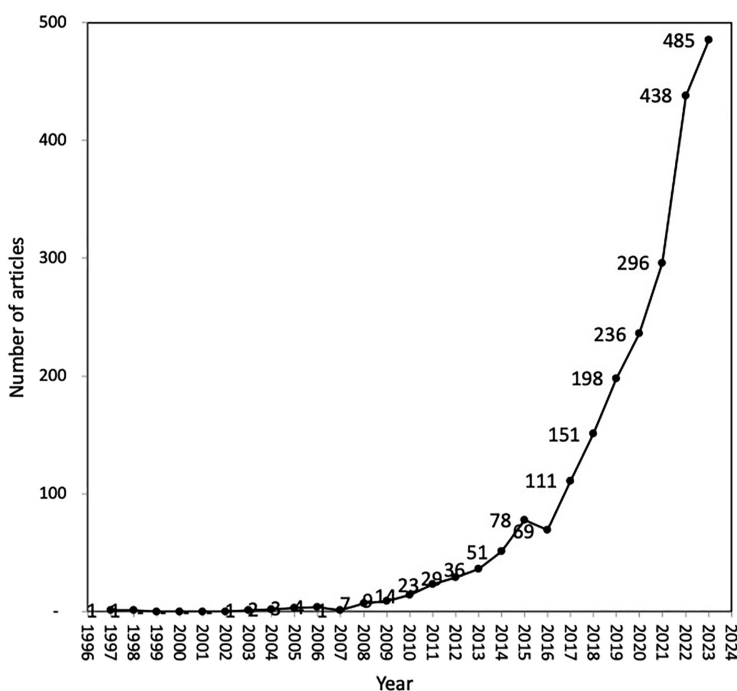
frequency of keywords (appearing in titles, abstracts, and author keywords) for each specific year, aiming to assess the research trends associated with these keywords. Text Analyzer - a free online text analysis tool (<https://www.online-utility.org/text/analyzer.jsp>) makes it possible to identify words and phrases that occur most frequently and we used it to dig deeper into the content of the retrieved document texts, mining thematic analysis on the titles and abstracts of the documents. By identifying recurring themes, emerging trends, and sentiment within the texts, this analysis aimed to uncover patterns and provide a more nuanced understanding of the research landscape surrounding PsyCap.

This study aimed to provide a thorough summary of PsyCap research with this approach, not only quantitatively through bibliometrics, but also qualitatively through text analysis. This holistic method allowed for a deeper exploration of the topic, revealing both the quantitative impact and the qualitative insights within the body of literature.

3. Results and discussion

3.1 Number of publication (year-wise)

The analysis of PsyCap articles shows a consistent and remarkable growth trend in article publications over the years. Figure 2 vividly illustrates this trend, showing a significant increase in articles on PsyCap, especially in the decade spanning from 2014 to 2023.



Source(s): Figure by the authors

Figure 2.
Number of articles
from 1997 to 2023

In 2014, there were 51 articles published on the topic, marking the starting point of this remarkable growth. In the following years, the number of articles continued to increase steadily, culminating in an impressive 485 articles in 2023. The total number of articles published in the two years 2022–2023 is equal to 69.9% of the previous years combined. The rapid rise in the quantity of PsyCap articles underscores the growing interest and the increasing importance of this concept in the academic and research community.

3.2 Research performance by countries

China is known to be the leading contributor to the field of PsyCap research, demonstrating outstanding productivity across all three publication indices: total publications (TP), number of publications by first-authored papers (FP), and corresponding-authored papers (RP). There were 671 articles on PsyCap, representing an impressive 29.9% of the entire dataset, attributed to China, firmly confirming the country's prominence in this area of research. Following closely behind was the United States with 320 articles.

In addition, two other Asian countries, India and South Korea, and one Oceania country, Australia, also made significant contributions to this field. India was credited with 141 articles, followed by South Korea (126 articles) and Australia (122 articles). These five countries, China, the United States, India, South Korea, and Australia, consistently emerge as the leaders in each publication category for the total number of articles published, including First Author publications, Corresponding Author publications, and Single Country publications. Their joint study results underscore the global importance and collaborative nature of PsyCap research, with a notable focus on Asia. [Table 1](#) shows the top 15 most productive countries.

Table 1.
Top 15 most
productive countries

Country	TP (rank)	FP (rank)	RP (rank)	SP (rank)
China	671 (1)	628 (1)	589 (1)	502 (1)
United States	320 (2)	219 (2)	195 (2)	172 (2)
India	141 (3)	133 (3)	123 (3)	113 (3)
South Korea	126 (4)	102 (4)	100 (4)	91 (4)
Australia	122 (5)	76 (5)	71 (5)	54 (6)
Pakistan	87 (6)	65 (6)	49 (11)	39 (12)
Spain	85 (7)	58 (10)	52 (8)	45 (10)
United Kingdom	82 (7)	34 (15)	36 (14)	24 (16)
Turkey	82 (9)	61 (9)	50 (10)	53 (7)
Taiwan	80 (10)	62 (8)	59 (7)	49 (9)
Malaysia	76 (10)	47 (13)	44 (12)	27 (13)
Iran	69 (12)	64 (7)	62 (6)	59 (5)
South Africa	66 (13)	56 (11)	52 (8)	52 (8)
Indonesia	56 (14)	53 (12)	41 (13)	42 (11)
Canada	50 (15)	29 (20)	20 (21)	23 (17)

Note(s): TP: total papers; FP: first-authored papers; RP: corresponding-authored papers; SP: single country-authored papers
Source(s): Table by the authors

A striking observation in the analysis of PsyCap research is the notable presence of Asian countries among the top contributors, with eight out of 15 countries with the highest number of studies on PsyCap in Asia. This phenomenon highlights the significant involvement and investment in PsyCap research in the Asian academic and research communities.

One possible explanation for the significant involvement of Asian scholars in PsyCap research may be connected to the area’s sociocultural and economic backdrop though several factors could contribute. Firstly, many Asian countries have experienced rapid economic growth and development in recent decades and, as these countries evolve and transition towards more knowledge-based economies, there is an increasing recognition of the importance of human capital and psychological well-being in the workplace. PsyCap, with its focus on positive psychological attributes such as self-efficacy, optimism, resilience, and hope, aligns well with the needs of a workforce in transition. This could explain the high interest in PsyCap research as a means to enhance employee well-being, productivity, and overall organizational performance.

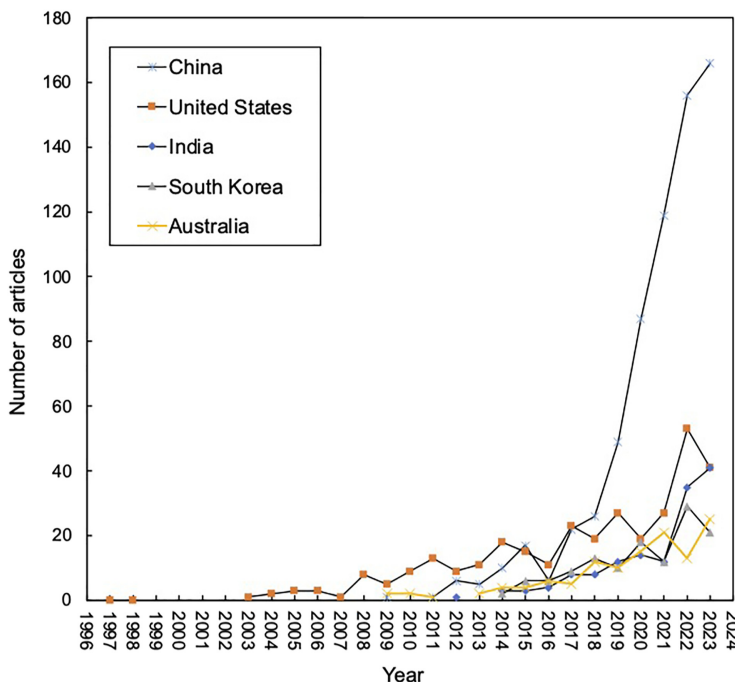
Luthans *et al.* (2008a, b) highlighted the value of PsyCap in the Chinese workforce and its relationship to performance while Donaldson *et al.* (2020) demonstrated the generalizability of PsyCap across 15 nations, showing its association with positive functioning at work. According to Sharma and Sharma (2015), PsyCap has a negative correlation with counterproductive workplace behavior and a positive correlation with organizational citizenship behavior. Alkahtani *et al.* (2021) highlighted the importance of taking cultural factors into account and offered a thorough framework that connects PsyCap to concepts like social capital, subjective well-being, and employee engagement. These papers support the idea that PsyCap aligns well with the needs of a transitioning workforce in Asian countries and can contribute to positive workplace outcomes.

Furthermore, the collectivist nature of many Asian societies places a strong emphasis on interpersonal relationships and group dynamics. PsyCap can be particularly relevant in these contexts as it not only addresses individual well-being but also has implications for team dynamics and overall organizational culture. According to Dawkins *et al.* (2021), PsyCap at the team level was linked to individual job satisfaction, turnover intent, and team performance and satisfaction. Tjosvold *et al.* (2002) highlighted the importance of

collectivistic values, cooperative goals, and constructive controversy in promoting productive teamwork. Alkahtani *et al.* (2021) emphasized the need to consider unique cultural aspects, such as in Saudi Arabia, when studying PsyCap and its relationship utilizing concepts such as social capital, subjective well-being, and employee engagement. Scholars in these regions might be drawn to PsyCap research as it offers insights into improving not only individual performance but also the collaborative and cohesive aspects of the workforce.

Moreover, the global nature of PsyCap research and its application across various industries and sectors could make it attractive to Asian scholars who aim to contribute to a growing body of knowledge with broader applicability. The high level of PsyCap research activity in Asian countries may be attributed to the region's evolving economic landscape, cultural values, and the broad relevance of PsyCap concepts. While PsyCap is not limited to developing nations, it appears to resonate particularly well with the challenges and goals faced by many Asian societies, driving their interest and investment in this field. Figure 3 compares the growth trends of the top five most productive countries. The number of Chinese research articles increased dramatically in the period 2019–2023, reaching a total of 577 articles (accounting for 35% of the global research articles published during this period). During these years, Chinese PsyCap research primarily focused on topics such as work engagement, job satisfaction, job burnout, mental health, Covid-19, occupational stress, social support, social capital, and perceived organizational support.

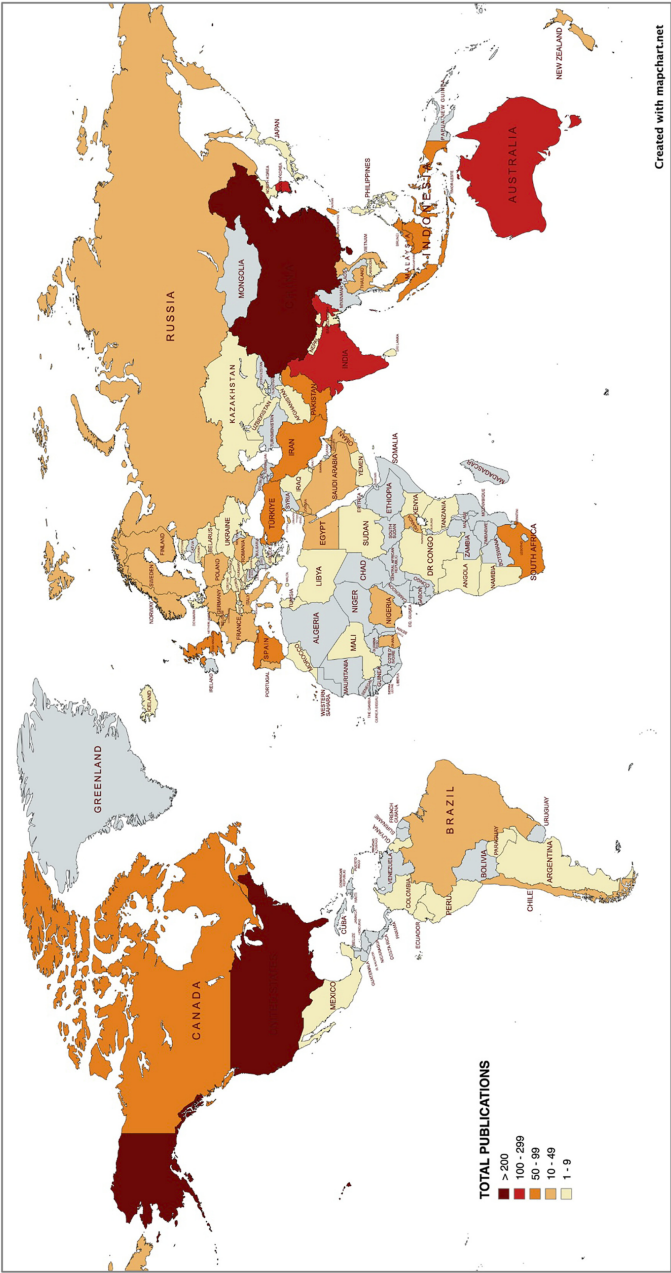
Figure 4 is the global distribution of research publications by country, which provides a visual representation of research output across different regions or disciplines.



Source(s): Figure by the authors

Figure 3.
Comparison the
growth trends of the
top five most
productive countries

Figure 4.
World map of the
distribution of research
publications by
country

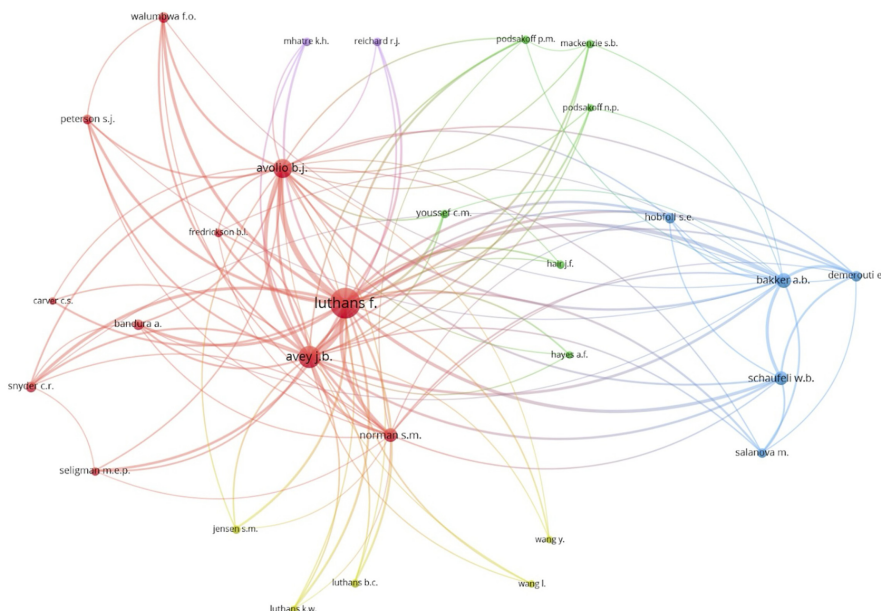


Source(s): Figure by the authors

3.3 Analysis of author co-citation

Author co-citation analysis involves using literature authors as the fundamental unit to establish relationships based on co-citations. When the works of two authors are cited together in a third piece of literature, it indicates a co-citation relationship between the two authors. Authors who are frequently co-cited tend to be associated with similar concepts, theories, or approaches within a subject area. Therefore, author co-citation analysis allows for the aggregation of multiple authors into discipline groups based on their citation relationships, thereby facilitating the identification of research directions and the division of author groups. After running the analysis through VOSviewer, we detected a total of 29 authors with 500 or more citations. These authors were then grouped into five clusters, as illustrated in Figure 5, with node size indicating author significance (i.e. citation frequency), line thickness reflecting the degree of shared citations (the figure only shows lines with a minimum strength of 1,000), and different colors denoting distinct clusters.

Statistics in Table 2 show that the number of authors with high citations is mainly in Cluster 1. Fred Luthans is a leading researcher in the fields of organizational behavior and management renowned for in-depth studies on organizational behavior, leadership, and positive psychology, including PsyCap. In one of his seminal studies he and his co-authors discussed the significance of PsyCap in the relationship between positive psychology and work performance (Luthans *et al.*, 2007). Additionally, he has conducted research on the impact of PsyCap on effective leadership and organizational innovation, contributing to the development of positive leadership and positive work environments. These studies by Luthans have shed light on the importance of PsyCap in promoting organizational success and sustainable development. Avey, a distinguished researcher in the fields of organizational behavior and leadership, primarily focuses on topics such as leadership effectiveness, employee engagement, and organizational culture, and has conducted extensive research



Source(s): Figure by the authors

Figure 5.
Mapping of co-citation
of PsyCap publications
with threshold of
minimum number of
citations of an author
is 500

Table 2.
Co-citation of authors
in PsyCap

Clustering	Most cited frequency authors (number of citations)
Cluster 1 (11 authors)	Luthans F. (11291), Avey J.B. (5417), Avolio B.J. (4263), Norman S.M. (2017), Bandura A. (1102), Walumbwa F.O. (1074)
Cluster 2 (6 authors)	Youssef C.M. (767), Podsakoff P.M. (747), Mackenzie S.B. (643), Hair J.F. (605), Podsakoff N.P. (583), Hayes A.F. (576)
Cluster 3 (5 authors)	Bakker A.B. (2390), Demerouti E. (1121), Hobfoll S.E. (1031), Salanova M. (809)
Cluster 4 (5 authors)	Luthans K.W. (752), Luthans B.C. (687), Jensen S.M. (668), Wang L. (565), Wang Y. (541)
Cluster 5 (2 authors)	Mhatre K.H. (647), Reichard R.J. (640)
Source(s): Table by the authors	

exploring various aspects of leadership, including transformational leadership, servant leadership, and authentic leadership. He is particularly known for his contributions to understanding the impact of leadership behaviors on employee attitudes, motivation, and performance. Avey’s research often emphasizes the importance of creating positive work environments and fostering employee well-being and have been influential in shaping contemporary theories and practices related to leadership and organizational behavior.

In [Figure 5](#), Cluster 1 consists of 11 authors, including Luthans, Avey, Avolio, Bandura, and seven others involved in various research areas such as organizational behavior, psychology, leadership, and positive psychology. This cluster is defined as “Positive Psychology and Organizational Behaviors”. The VOSviewer analytic results show that this cluster included the most influential authors, as indicated by the highest number of citations, which confirms the research topics in this cluster received the most attention among PsyCap scholars.

Cluster 2, consisting of six authors, including Youssef, Podsakoff, Mackenzie, and another three, is labeled as “Constructs of PsyCap” due to their significant contributions in elucidating the various components of PsyCap. Podsakoff and Mackenzie conducted a seminal study examining bias issues in behavioral research, which has had a profound impact on the analysis of PsyCap scales and is widely referenced in PsyCap studies. Their research delves into components such as hope, optimism, resilience, and self-efficacy ([Youssef and Luthans, 2007](#); [Avey et al., 2009](#); [Mackenzie et al., 2011](#)), advancing not only our theoretical understanding of PsyCap but also laying the foundation for the development of reliable measurement tools to accurately assess these constructs.

Cluster 3, consisting of five authors, primarily Bakker and Schaufeli, illustrates specialized expertise in research related to work engagement and burnout ([Bakker and Schaufeli, 2008](#); [Schaufeli et al., 2002](#)). We have dubbed this cluster “PsyCap and Work Engagement and Burnout” to underscore its focus on the influence of PsyCap on employee attitudes and behaviors within organizational contexts. The research conducted by authors in this cluster on work engagement and burnout, as referenced in PsyCap studies, establishes a robust theoretical groundwork for two principal outcomes of PsyCap in organizational environments. This encourages further examination of the interplay between PsyCap and engagement and burnout, as well as the significance of engagement and burnout in the relationship between PsyCap and other organizational factors.

Cluster 4, consisting of five authors, primarily Kyle Luthans, Brett Luthans, and Jensen, is identified as “PsyCap in Academic Environments” reflecting scholarly pursuits exploring the applicability of PsyCap principles within educational settings. Their research delved into the role of PsyCap in fostering academic achievement, student motivation, and faculty

engagement, and highlighted the potential benefits of cultivating PsyCap among students and educators alike.

While the inclusion of this cluster could potentially enrich the study, the insufficient sample size precludes meaningful interpretation and hinders its utility in guiding future research endeavors.

Cluster 5 includes only two authors, Mhatre and Reichard, whose most frequently cited primary work is a meta-analytic study they co-authored with Avey that examined the influence of PsyCap on various employee outcomes, including attitudes, behaviors, and performance (Avey *et al.*, 2011). Hence, this cluster is omitted from further analysis due to the paucity of data. While the inclusion of this cluster could potentially enrich the study, the insufficient sample size precludes meaningful interpretation and hinders its utility in guiding future research endeavors.

3.4 Research tendencies and hotspots

Analyzing word distribution in article titles, abstracts, and author keywords can be highly instructive when assessing research topic trends (Marrone, 2020). This approach, often called text analytics or text mining, provides valuable insights into key themes and common themes within a particular field of study. How each of these components can contribute to understanding the trends of the research topic are as follows:

Title words: Examining commonly used words and phrases in article titles can reveal the main focus of research in a field. Terms that frequently appear in titles can indicate central themes (Harmon and Gross, 2009).

Specifically, in the context of PsyCap research, trends in article titles can highlight specific areas of interest, such as “mental health”, “coherence with job”, “job satisfaction” or “occupational stress”. Several phrases were repeated in article titles with their respective frequency. “Mediating role of psychological capital” (97 titles): This phrase suggests an emphasis on exploring the mediating effects of PsyCap in a variety of contexts and researchers may be investigating how PsyCap acts as a mediator in relationships between other variables or factors. “A cross-sectional study” (29 titles): This phrase indicates that a substantial portion of PsyCap research involves cross-sectional study design and the approach allows researchers to examine data at a specific point in time, providing insight into relationships. “The impact of psychological capital” (28 titles): Researchers are assessing the impact of PsyCap on various outcomes, such as happiness, performance, or satisfaction with life/work balance. This phrase emphasizes the focus on understanding the consequences of PsyCap. “Moderating role of psychological capital” (20 titles): The mention of a “moderating role” suggests researchers are exploring how PsyCap can regulate or influence the strength and nature of relationships between other variables, showing the focus on PsyCap as the control variable. “During the Covid-19” (39 titles): The Covid-19 pandemic has had a profound impact on many different aspects of work and life and the inclusion of this phrase suggests researchers are studying the role of PsyCap in the context of a pandemic, addressing issues related to resilience, adaptation, and coping strategies. “Psychological capital and work engagement” (16 titles): The phrase reflects a specific interest in exploring the relationship between PsyCap and work engagement and suggests researchers are investigating how PsyCap can affect or contribute to employee engagement and motivation. These common phrases in article titles not only provide an overview of key topics and research directions in the PsyCap field but also highlight the importance of understanding the mediating and moderating roles and the impact of PsyCap in different contexts, including the unique challenges posed by the Covid-19 pandemic.

Analyzing the most frequent words in article titles will provide valuable insights into core PsyCap concepts and research topics, with. The most common words and their frequency in

headlines are as follows: psychological capital (1,523), well-being (141), Covid-19 (121), work engagement (98), authentic leadership (68), job satisfaction (63), mental health (54), social support (52), college students (51), job performance (48), university students (46), organizational commitment (38), job burnout (35), moderated mediation model (35), turnover intention (34), social capital (29), nursing student (26), and perceived organizational support (24).

The leading single words in the title (excluding prepositions) also provide insight into key concepts and research directions in the field of PsyCap, including: psychological (1,678), capital (1,653), role (505), work (322), mediating (304), job (300), relationship (246), positive (246), performance (242), students (235), organizational (216), leadership (209), study (206), social (195), engagement (186), effect (182), behavior (165), employees (162), impact (157), effects (143), nurses (141), support (137), burnout (133), influence (132), stress (129), satisfaction (127), and health (127).

Top Author Keywords: Keywords supplied by the author highlight information about research trends that ultimately address researchers' concerns (Wambu *et al.*, 2017). Author keywords are chosen by the authors themselves to represent the main concepts or topics in their research. Analyzing the distribution and frequency of author keywords can provide valuable insights into specific topics that researchers consider most relevant within a field. Mayr (2014) demonstrated that bibliometric-enhanced retrieval services offer highly relevant recommendations by using search terms, journal names, and author names.

Amiri *et al.* (2021) explored the hashtag recommendation domain and identified popular research topics and trends, such as similarity, machine learning, hashtag recommendation, and popularity forecasting. Catone *et al.* (2020) mapped new subjects and current trends in social research techniques using keyword co-occurrence analysis, offering insights into the hottest subjects and cutting edges of the industry. These findings collectively support the idea that analyzing author keywords can offer a targeted look at the specific topics that researchers find most relevant within a field (Hoi, 2021) and can also reveal emerging or niche areas that general text analysis may not.

Analysis of the top author keywords in PsyCap research reveals several key findings, demonstrating the multidisciplinary nature of PsyCap and its wide-ranging applications: "psychological capital" is the most frequently used keyword, appearing in 62.2% of articles, underscoring its centrality to research. "Positive psychological capital" is also important, appearing in 5.9% of the articles. These terms emphasize the positive psychological orientation of PsyCap research. In addition, the inclusion of four positive psychology resources, self-efficacy, optimism, resilience, and hope, signifies their relevance within the PsyCap framework.

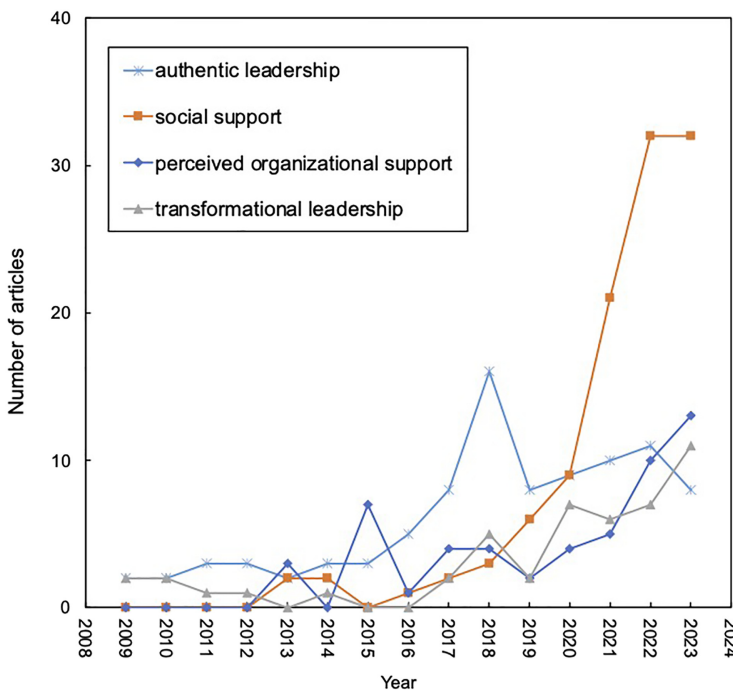
In the field of business management, there are several keywords that stand out, indicating the areas of greatest interest. "Work engagement" is a prominent keyword, reflecting significant interest in understanding how PsyCap relates to employee motivation and engagement, with a prevalence rate of 5.9%. "Job satisfaction" (4.2%), "burnout" (3.1%), and "well-being" (3.0%) also denote an emphasis on employee behaviors and attitudes in the PsyCap research context within management or business management.

The keywords "social capital" and "authentic leadership" indicate a focus on leadership qualities in social relationships within the context of PsyCap. These terms suggest that there is interest in exploring how PsyCap concepts intersect with leadership theories and organizational resources.

The presence of "Covid-19" and "nurses" highlight the relevance of the PsyCap study to current events and specific professional groups. Given its significant effects on both work and health, the Covid-19 pandemic is a crucial study area for the PsyCap framework. The inclusion of "nurses" suggests that researchers are exploring the application of PsyCap principles in healthcare settings, particularly in nursing contexts.

Figure 6 displays popular keywords within the “antecedents of PsyCap” group that fluctuated between 2009 and 2023. These keywords include authentic leadership, transformational leadership, social support, and perceived organizational support, clearly highlighting the topics of greatest interest to researchers. The number of articles on these topics generally increased over time, most notably “social support” which increased significantly in the three years from 2021 to 2023.

The top author keywords in PsyCap research reflect the broad applicability of PsyCap concepts in a variety of fields, including business management, leadership, and healthcare. These keywords offer insightful information about the various viewpoints and fields of study that the PsyCap research community encompasses. By analyzing the distribution of keywords, abstracts, and titles over the years, several notable trends have emerged, particularly concerning PsyCap’s antecedents. A significant trend is the decline in research focusing on leadership as a precursor to PsyCap which suggests that leadership’s prominence has decreased over time. This shift indicates that researchers are now exploring a broader range of factors that support the emergence of PsyCap, moving beyond the traditional emphasis on leadership. In contrast, there has been a notable increase in the focus on social support and organizational support as PsyCap antecedents which suggests a growing interest in understanding how organizational and social factors influence the creation and improvement of PsyCap. Researchers are recognizing the crucial role of support networks, both within and outside the workplace, when fostering interpersonal PsyCap. These trends reflect the evolving landscape of PsyCap research, suggesting a shift from leadership-related antecedents to a greater emphasis on social support systems and organizations when forming individual PsyCap. This development underscores the dynamic nature of the field as



Source(s): Figure by the authors

Figure 6.
Comparison the
growth trends of the
antecedents of PsyCap,
including authentic
leadership,
transformational
leadership, social
support, and perceived
organizational support

researchers explore new avenues and premises for understanding and leveraging the concept of PsyCap.

Figure 7 is a comparison of the growth trends of the consequences of PsyCap, including work engagement, job satisfaction, burnout, well-being, mental health, job performance, and organizational commitment.

The analysis of the outcomes of PsyCap reveals notable trends and shifts in research focus. Growing and considerable attention has been paid to the effects of psychological capital on physical and mental health which indicates researchers are increasingly recognizing the importance of PsyCap when enhancing an individual's overall mental and emotional well-being. This shift in focus reflects a broader awareness of the importance of PsyCap in promoting positive mental states and emotional resilience. Notably, in 2022 and 2023, there was increased focus on PsyCap outcomes related to work engagement and job performance. Simultaneously, researchers are delving deeper into how PsyCap influences employees' motivation, dedication, and work-related performance. The specific attention to these aspects in 2023 may indicate emerging trends or developing research questions in the field.

Keyword co-occurrence: Keywords play a crucial role in refining the content of literature by highlighting specific themes and concepts. Through the examination of keywords, researchers can identify the prevalent topics within a particular field. Table 3 shows the co-occurrence of author keywords in PsyCap.

In this investigation, we utilized keywords extracted from the VOSviewer software to identify the focal points of research on psychological capital. The network node was determined as the author keyword, and the threshold value of the minimum occurrence times

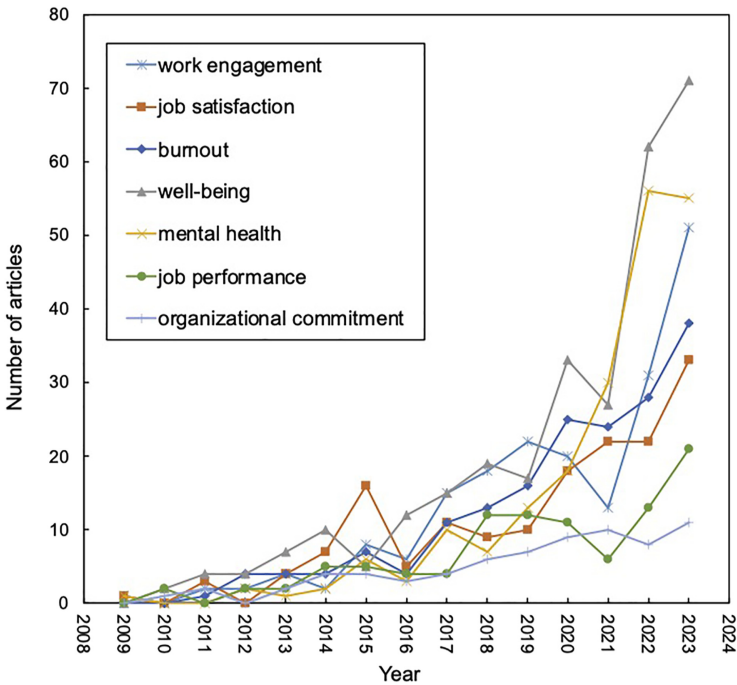


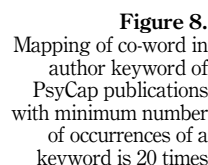
Figure 7. Comparison the growth trends of the outcomes of PsyCap, including work engagement, job satisfaction, burnout, well-being, mental health, job performance, and organizational commitment

Source(s): Figure by the authors

Source(s): Table by the authors

Co-occurrence of
keywords in PsyCap

Cluster 1 is categorized under the name “The role of PsyCap in the organizational environment” due to various research topics related to PsyCap, including social support,



Source(s): Figure by the authors

perceived organizational support, authentic leadership, job satisfaction, work engagement, organizational commitment, turnover intention, and mediating effects. This term reflects the comprehensive exploration of how PsyCap influences and interacts with these constructs within organizational settings. By focusing on the impact and mediating role of PsyCap, researchers aim to understand its significance in shaping employee attitudes, behaviors, and organizational outcomes. Additionally, it acknowledges the intricate relationships between PsyCap and other variables, highlighting its role as a mediator in driving organizational effectiveness.

In Cluster 2, the overarching term “PsyCap and adolescents’ well-being” was chosen to encompass various research topics related to PsyCap, including Covid-19, well-being, mental health, burnout, students, adolescents (as an emerging keyword), and stress. This term reflects a comprehensive examination of how PsyCap influences adolescents’ well-being, particularly in the context of the Covid-19 pandemic. By focusing on PsyCap and adolescents’ well-being, researchers aim to understand the role of PsyCap in mitigating stress, promoting mental health, and preventing burnout among adolescents. This holistic approach acknowledges the unique challenges faced by adolescents, especially during a crisis, and underscores the importance of PsyCap in fostering resilience and enhancing overall well-being in this population.

Cluster 3, featuring keywords such as positive psychology, positive organizational behavior, innovative behavior, and creativity, is aptly named “PsyCap and innovative behavior”. This term represents a thorough examination of how PsyCap affects individuals’ propensity for innovation and creativity within organizational settings. Researchers aim to understand PsyCap and innovative behavior’s role in fostering a positive mindset, adaptive behaviors, and creative problem-solving abilities among individuals as this approach recognizes the connections between PsyCap, positive organizational behavior, and innovative outcomes, emphasizing the importance of psychological resources in driving organizational innovation and success.

The overarching term “PsyCap among university students” was chosen to encompass Cluster 4, with various research topics related to PsyCap, including college students, university students, entrepreneurial intention, and academic performance, reflecting a comprehensive examination of how PsyCap influences the attitudes, behaviors, and performance of university students. By focusing on PsyCap among university students, researchers aim to understand its role in shaping entrepreneurial intentions and academic performance within this demographic. This holistic approach acknowledges the unique challenges and opportunities faced by university students and underscores the importance of PsyCap in enhancing their personal and academic development.

Cluster 5, with “entrepreneurship, human capital, life satisfaction, mediation, social capital”, is categorized under the theme “PsyCap in human life” to reflect the comprehensive exploration of PsyCap within various aspects of human existence. By investigating how PsyCap influences entrepreneurship, the development of human capital, levels of life satisfaction, processes of mediation, and the formation of social connections, this cluster aims to provide insights into the multifaceted impact of PsyCap on different dimensions of human life.

Cluster 6 consists of the four structural components of PsyCap (hope, self-efficacy, resilience, and optimism), so this cluster is respectively identified under the overarching theme of “PsyCap dimensions”.

4. Conclusion and future research directions

4.1 Concluding remarks and future research agenda

In conclusion, this research employed a multifaceted approach combining bibliometric analysis and text mining to provide comprehensive insights into the landscape of PsyCap

research. Our analysis revealed significant growth in PsyCap publications over the years, with a significant increase from 2022 to 2023, and China emerging as a prominent contributor alongside the United States and other Asian countries. The rise of PsyCap research in Asia reflects the region's growing recognition of the importance of psychological well-being in the workplace, driven by rapid economic development and cultural values emphasizing collective success. Author co-citation analysis revealed key researchers and clusters within the PsyCap field, highlighting the prominence of scholars like Fred Luthans, Avey, and Avolio, who significantly contributed to understanding PsyCap's role in organizational behavior and leadership. Text analysis further elucidated research trends, indicating a shift from leadership-focused antecedents to a broader exploration of social and organizational factors influencing PsyCap development. Analysis of article titles, author keywords, and abstracts uncovered emerging topics such as PsyCap's impact on adolescents' well-being, innovative behavior, and university students' outcomes. Additionally, the Covid-19 pandemic emerged as a focal point, underscoring the relevance of PsyCap in times of crisis. These findings suggest promising future directions for PsyCap research, including longitudinal studies to explore the long-term effects of PsyCap interventions and interdisciplinary collaborations to enrich our understanding of PsyCap's implications across various domains.

The comprehensive analysis of PsyCap research findings illuminates several nuanced insights into its multifaceted structure and potential implications across various domains. Through meticulous examination utilizing bibliometric analysis, text mining, author co-citation analysis, and exploration of research tendencies and hotspots, numerous critical themes and emerging trends were revealed.

First and foremost, the observed shift in research focus from traditional leadership antecedents to a broader exploration of social support systems and organizational factors as precursors to PsyCap signifies a profound evolution in the field. This shift underscores the dynamic interplay between contextual variables and PsyCap development, suggesting future avenues for research into the intricate mechanisms underlying PsyCap formation within diverse organizational settings.

Moreover, the notable emphasis on the outcomes of PsyCap, particularly its effects on physical and mental health, work engagement, and job performance, highlights the transformative potential of PsyCap in fostering individual well-being and organizational success. Future research directions may delve deeper into understanding the specific pathways through which PsyCap influences these outcomes, exploring potential moderating and mediating variables that may further elucidate the complex relationships involved.

Furthermore, the multidisciplinary nature of PsyCap research, as evidenced by its applications across fields such as business management, leadership, healthcare, and education, underscores the need for interdisciplinary collaboration and integration of diverse perspectives. Future studies could benefit from interdisciplinary approaches that draw upon insights from psychology, sociology, management, and other relevant disciplines to enrich our understanding of PsyCap's implications for human behavior and organizational dynamics.

Additionally, emerging research areas such as PsyCap's influence on adolescents' well-being, innovative behavior, and university students' outcomes present exciting opportunities for further inquiry and exploration. Future research endeavors could focus on longitudinal studies to examine the long-term effects of PsyCap interventions in these populations, as well as explore novel applications of PsyCap concepts when addressing contemporary societal challenges.

Lastly, key concepts and keywords identified in PsyCap research, such as "psychological capital", "work engagement", and "social support" serve as pivotal anchors for future investigations. Future research directions may involve refining measurement instruments, developing intervention strategies, and exploring novel applications of PsyCap concepts in

diverse contexts. In essence, the collective findings offer invaluable insights into PsyCap's role in fostering individual and organizational flourishing. By identifying key themes, emerging trends, and promising research directions, this body of work paves the way for future studies aimed at unlocking the full potential of psychological capital in promoting positive outcomes and societal well-being.

4.2 Limitations

Despite the above contributions, it is essential to acknowledge the limitations of our study. Perrier *et al.* (2016) and Oliveira *et al.* (2015) highlighted the limitations of bibliometric analysis in capturing the entirety of a research field. Firstly, while bibliometric analysis and text mining provide valuable insights into research trends and themes, they may not capture the entirety of PsyCap literature, as some publications may not be indexed or may use different terminology. Additionally, our analysis focused primarily on published articles, potentially overlooking relevant contributions from other sources such as conference papers or grey literature. Secondly, reliance on automated text analysis tools introduces the possibility of error in data processing and interpretation. While efforts were made to validate the results manually, there may still be inaccuracies or misinterpretations in the findings. Thirdly, our study predominantly examined quantitative aspects of PsyCap research, with limited qualitative analysis. While bibliometric analysis and text mining offer quantitative metrics and trends, they may not capture the depth of qualitative insights and nuances present in individual studies. Furthermore, our study primarily focused on research output and collaboration patterns, overlooking other factors such as funding sources, institutional dynamics, and sociopolitical influences that may shape PsyCap research. Finally, the interpretation of research trends and future directions is inherently speculative and subject to change as the field evolves. While our analysis provides valuable insights into current patterns and emerging topics, future developments in PsyCap research may diverge from our projections.

Despite these limitations, our study offers a comprehensive overview of PsyCap research, highlighting key trends, contributors, and future directions. By recognizing these limitations, future research endeavors can build upon our findings to further advance our understanding of psychological capital and its implications for individual and organizational well-being.

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