Review of Resilience Research Based on CiteSpace

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Abstract. With the large-scale outbreak of the COVID-19 pandemic, research on resilience has attracted the attention of experts and scholars. In order to understand the current status and future development direction of resilience research, CiteSpace was used to visualize and analyze 1488 resilience literature from WOS. This study has found that research on resilience has shown rapid growth, scattered research institutions, and prominent research themes. In the future, research on resilience will pay more attention to the mental health of social groups and medical staff, while promoting the practical and complex application scenarios of resilience.

Keywords: Resilience, CiteSpace, Visual analysis, COVID-19

1 Introduction

Resilience primarily refers to individuals going through challenging or crisis situations [1, 2], but can still avoid the negative developmental paths caused by the crisis and successfully cope with traumatic experiences[3]. With the global pandemic of COVID-19, the resulting social isolation and economic uncertainty have led to a significant increase in mental health problems, including loneliness, anxiety, depression and suicidal ideation [4]. People tend to have different levels of stress response and post-traumatic stress disorder [5, 6]. Therefore, during the epidemic, the COVID-19 pandemic is considered a threat to psychological resilience[7]. During the pandemic period, psychological resilience in particular rises in prominence[8].

Previous studies have elaborated on the current state of resilience research in different groups, such as Bozdag and Ergun（2021） explored the resilience of healthcare professionals during the COVID-19 pandemic [9], and Prime et al. (2020) explored the resilience of family happiness during the COVID-19 pandemic, but few included the review of research on resilience during the COVID-19 pandemic. CiteSpace V Software is a visual analysis software [10]. This article used CiteSpace V software to draw various knowledge maps of the relevant research literature on resilience since 2014, sorts out the research status, research hotspots and frontiers in the field and possible future development trends, and attempts to show the future directions of it.

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2 Information and Methodology

2.1 Information

In order to ensure that the original data is comprehensive, accurate, and highly credible, this article chose advanced search. SSCI citation index was selected, and "(TS=(Resilience)) AND TS=(Psychology)" search terms were used as the subject of search in the WOS database, and the time limit was from January 2014 to March 2023. Moreover, the category set as journal type and the nonacademic papers such as reports and proceedings have been deleted. As a result, 1488 articles are selected for the research.

2.2 Methodology

Research and aggregation of the literature data mentioned above, import to CiteSpace database. The threshold values for each parameter are set as follows: At "TimeSlicing", set the study year to January 2014 until December 2023; In "YearsperSlice", set to every year; In "Pruning" item, set the "Pathfinder"; In the Node Type, set "Keywords"; others parameter are the default option.

3 Results

3.1 Literature volume analysis

As shown in Fig.1, 1488 articles were organized according to the time of publication. From the perspective of the number of articles published, from 2014 to the present, the number of literature has increased as a whole. The growth from 2014 to 2018 was relatively slow, showing a wave trend. From 2019 to 2022, the number of articles published surged and peaked in 2021. Overall, research on resilience in psychology has gone from slow to rapid growth. The surge in literature began in 2019, suggesting that it may be related to the outbreak of the Coronavirus epidemic.

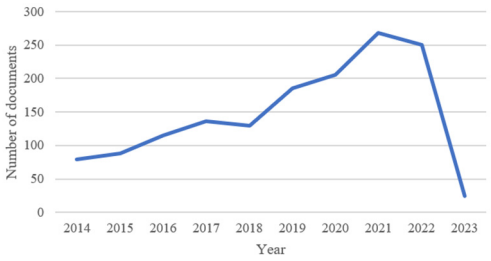

Fig. 1. Number of documents issued

3.2 Institutional and country analysis

Based on WOS data, the volume of national publications was analyzed to understand the concerns of different countries and institutions in resilience research in the field of psychology. As

presented in Table 1, the literature on resilience research of psychology included in WOS mainly concentrates in the United States, the United Kingdom, Australia and Canada. The United States has 571 articles, followed by the United Kingdom, Australia and Canada with 169, 136 and 113 articles respectively. It can be seen from the number of articles published by the country that the research on resilience in psychology is mainly concentrated in developed countries such as European and American countries. The United States is the country with the most significant number of posts in total. In addition, although Canada ranks fourth in the total number of publications, relevant research institutions rank second and third in the number of publications in this field, indicating that relevant Canadian institutions have strong scientific research strength in this field.

Table 1. Number of literature issued

Country	Number of articles	Main issuing institutions
United States	571	University of Michigan（18）
United Kingdom	169	University Of Nottingham（13）
Australia	136	Curtin University（10）
Canada	113	McGill University（15）
People's R China	96	Henan University（7）

Table 2. Number of literature issued

Institution	Number of articles
University of Michigan	18
McGill University	15
University of Toronto	14
University Of Nottingham	13
Columbia University	11
Stanford University	10
Curtin University	10

In addition, as shown in Table 2, the University of Michigan, McGill University and University of Toronto rank as the top three institutions in the number of publications, which implies that Western countries take a leading position in the field of resilience research and are currently concentrated in universities. Social institutions pay less attention, which may suggest that the practical application and promotion of psychological resilience need to be strengthened.

3.3 Reference co-citation analysis

In order to understand contributions that have an important impact on this field and identify the relevance of contributions between multiple papers [11], we conducted a co-citation analysis by CiteSpace V. Node response refers to the number of co-citations. The larger the node is, the stronger the centrality is, and the more times it is co-cited; The links reflects the connection between references. As shown in Fig. 2, Fletcher D (2013) and BolierL (2013) were cited the most frequently, 25 and 21 times respectively, reflecting the core role of their related research in the knowledge network of physical elasticity; The connection between Wang YL (2021) and

Greenier V (2021) is the closest, with a total of 15 and 12 citations, respectively, reflecting a strong correlation between the research content of their articles.

In addition, in order to have a comprehensive understanding of the research in the field of physical elasticity and to understand the main contributors to the field, explore the intersection between research fields [12]. We continue to conduct a cluster analysis of co-cited data. Co-citation cluster analysis is helpful in discovering the distribution of relevant research in multiple fields. This study uses the LLR test algorithm to perform cluster analysis on co-citation. The larger the cluster number, the greater the research scale and the research enthusiasm under the cluster[11]. The modular Q= 0.8044, > 0.3, indicating that the cluster is significant; MeanSihouette= 0.9254, > 0.7, indicating that the clustering result is convincing.

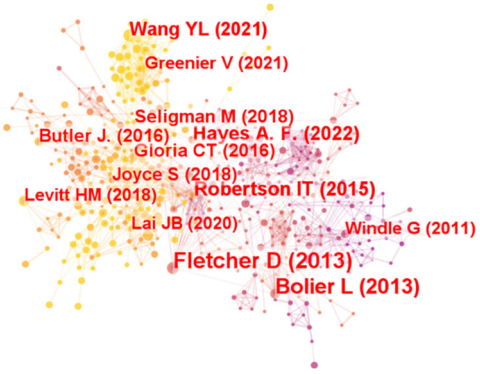

Fig. 2. Cluster view of hotspots in resilience

The top 15 clusters are extracted from the main tag content discussed in the clustering module, which are the Covid-19 panel, Pain resilience scale, Iranian efl teacher, Multilevel review, Controlled trial, Negative pain-related psychological factor, School psychologist, Sports resilience model, Resilience war, Psychological capital, Psychological capital, Teacher resilience, Longitudinal investment, Special issues, Pre-school teachers and Challenges opportunities, see Table 3. Covid-19 pandemic was the clustering topic with the largest scale and highest popularity. The article “Factors Associated With Mental Health Outcomes Among HealthCare Workers Exposed to Coronavirus Disease 2019”, published by Lai JB, made an important contribution to this field, suggesting that the resilience of medical staff during the COVID-19 epidemic was highlighted. In addition, there is a crossover in the research fields of Controlled Trial, Psychologically Capital, and challenges opportunities, suggesting that some research on resilience focuses on addressing challenges and opportunities by enhancing psychological capital. The intersection of research fields in Multilever review, School psychologist, Longitudinal motivation, and Special issue suggests that current school psychologists' research methods for resilience mainly focus on multi-level analysis, case analysis, and longitudinal research.

Table 3. Cluster view of reference co-citation author

Cluster	Main reference author
#0 Covid-19 pandemic	Lai JB (2020)
#1 Pain resilience scale	Windle G (2011)

#2 Iranian efl teacher	Wang YL (2021)
#3 Multilevel review	Fletcher D (2013)
#4 Controlled trial	Gloria CT (2016)
#5 Negative pain-related psychological factor	Bolier L (2013)
#6 School psychologist	Masten AS (2014)
#7 Sporting resilience model	Bryan C (2019)
#8 Resilience war	Weight MO (2013)
#9 Psychological capital	Luthans F (2017)
#10 Teacher resilience	McNuity JK (2012)
#11 Longitudinal investigation	Hayes A.F. (2022)
#12 Special issue	American Psychiatric Association (2013)
#13 preschool teacher	Tedeschi R.G. (2018)
#14 challenges opportunities	Levitt HM (2018)

3.4 Keywords analysis

In view of the fact that keywords have a general effect on the research content [10, 12], in order to understand the current research hotspots, this study analyzes the frequency and contribution of keywords. As shown in Fig.4, resilience, positive psychology, mental health, psychology, health, stress, impact, depression, validation, and performance are the top ten high-frequency words. It can be seen from these high-frequency keywords that the research on psychological resilience in the field of psychology mainly focuses on positive psychology, which is applied to relieve stress and depression, maintain mental health, and improve the quality of life.

Through cluster analysis of data keywords in WOS, the top ten clusters were extracted: Children resilience, conspiracy theories, mitigating students anxiety, psychological capital, sport engagement, psychometric properties, blac model, context sensitive, self-reported, interoceptive sensibility, teacher-student interaction. As shown in Fig.5, research on the resilience of psychology mainly focuses on education, especially children's mental health. Furthermore, various strategies are used, such as sports participation and teacher-student interaction to enhance children's psychological capital and alleviate anxiety. Among them, the self-report method is the main method for measuring psychological resilience.

Fig. 4. Hotspot knowledge map of resilience

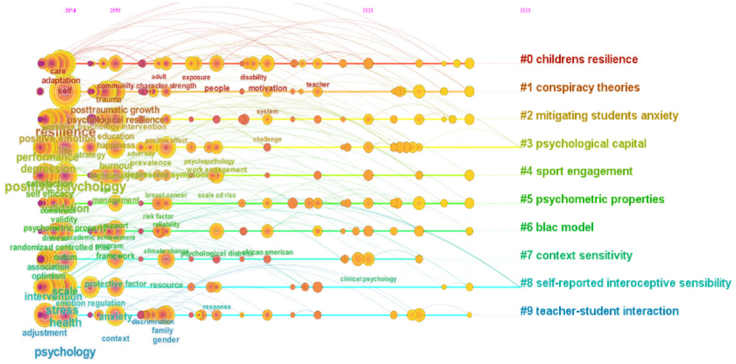

Fig. 5. Cluster view of hotspots in resilience

4 Discussion

Based on the analysis above, we summarize the relevant research on resilience in psychology from 2014 to 2023 into three areas. Firstly, in terms of research objects, in WOS data, students are the group with the largest number of occurrences, followed by children. The research objects are mostly concentrated on children and students. After the emergence of the COVID-19 pandemic, the research subjects turned to social groups, especially healthcare professionals. On the one hand, the pandemic of COVID-19 has promoted the research on the response of individuals and groups to tragedy. To help populations around the world cope and recover from the global threat of COVID-19, recent advances in resilience research have shifted away from merely describing individual characteristics towards focusing on the complex interactions between individuals and their dynamic personal, community and cultural contexts[5, 13].On the other hand, healthcare professionals are the most affected people in COVID-19 pandemic. Common psychological effects include anxiety, panic, depression, anger, confusion, ambivalence, and financial stress[9]. The research object of resilience began to focus on healthcare professionals. Secondly, in terms of research objectives, in the past, the field of resilience has been committed to achieving children's mental health and alleviating students' anxiety and depression[14]. During the COVID-19 pandemic, resilience turned to helping individuals cope with crisis events and improve family happiness. At the same time, it is committed to providing medical care providers with rich services to improve their resilience to solve the stress, anxiety and depression related to COVID-19 [7]. In addition, the analysis of the outbreak of the strongest citation of keywords also shows that with the end of the COVID-19 pandemic in 2023, college students' resilience has begun to receive renewed attention. Third, in terms of practical application scenarios, the study shows a gradual shift from campus application to social application, which means that psychological resilience has potential value in helping people cope with major public events in society.

5 Conclusion

This is a systematic review, and previous reviews have usually focused only on groups such as children or nurses. This review highlights the shift in the focus on resilience during the pandemic, particularly as resilience is more widely used in the public community. In future research, it is also necessary to compare resilience studies in Eastern and Western countries to explore cross-cultural differences in resilience research.

This study uses CiteSpace V software to comprehensively analyze the literature on resilience in psychology from 2014 to 2023 in the WOS database, which can help researchers quickly identify research hotspots and provide direction for future research. In future research, we hope to analyze the internal process of resilience through meta-theory, meta-method and cognitive science research perspectives, understand the mechanism of resilience to expand the application scenarios of psychological resilience and contribute to public mental health work.

References

[1] J. E. Brooks, "Strengthening Resilience in Children and Youths: Maximizing Opportunities through the Schools," *Children & Schools,* vol. 28, no. 2, pp. 69-76, 2006, doi: 10.1093/cs/28.2.69.

[2] A. S. Masten, "Ordinary magic. Resilience processes in development," *Am Psychol,* vol. 56, no. 3, pp. 227-38, Mar 2001, doi: 10.1037//0003-066x.56.3.227.

[3] S. S. Luthar and D. Cicchetti, "The construct of resilience: implications for interventions and social policies," *Dev Psychopathol,* vol. 12, no. 4, pp. 857-85, Autumn 2000, doi: 10.1017/s0954579400004156.

[4] W. D. S. Killgore, S. A. Cloonan, E. C. Taylor, I. Anlap, and N. S. Dailey, "Increasing aggression during the COVID-19 lockdowns," *J Affect Disord Rep,* vol. 5, p. 100163, Jul 2021, doi: 10.1016/j.jadr.2021.100163.

[5] H. Kaye-Kauderer, J. H. Feingold, A. Feder, S. Southwick, and D. Charney, "Resilience in the age of COVID-19," *BJPsych Advances,* vol. 27, no. 3, pp. 166-178, 2021, doi: 10.1192/bja.2021.5.

[6] K. Yuan *et al.*, "Prevalence of posttraumatic stress disorder after infectious disease pandemics in the twenty-first century, including COVID-19: a meta-analysis and systematic review," *Mol Psychiatry,* vol. 26, no. 9, pp. 4982-4998, Sep 2021, doi: 10.1038/s41380-021-01036-x.

[7] Z. Ye *et al.*, "Resilience, Social Support, and Coping as Mediators between COVID-19-related Stressful Experiences and Acute Stress Disorder among College Students in China," *Appl Psychol Health Well Being,* vol. 12, no. 4, pp. 1074-1094, Dec 2020, doi: 10.1111/aphw.12211.

[8] G. D. Smith, F. Ng, and W. Ho Cheung Li, "COVID-19: Emerging compassion, courage and resilience in the face of misinformation and adversity," *J Clin Nurs,* vol. 29, no. 9-10, pp. 1425-1428, May 2020, doi: 10.1111/jocn.15231.

[9] F. Bozdag and N. Ergun, "Psychological Resilience of Healthcare Professionals During COVID-19 Pandemic," *Psychol Rep,* vol. 124, no. 6, pp. 2567-2586, Dec 2021, doi: 10.1177/0033294120965477.

[10] C. Chen, "CiteSpace II: Detecting and visualizing emerging trends and transient patterns in scientific literature," *Journal of the American Society for Information Science and Technology,* vol. 57, no. 3, pp. 359-377, 2006, doi: 10.1002/asi.20317.

[11] C. Chen, F. Ibekwe-SanJuan, and J. Hou, "The structure and dynamics of cocitation clusters: A multiple-perspective cocitation analysis," *Journal of the American Society for Information Science and Technology,* vol. 61, no. 7, pp. 1386-1409, 2010, doi: 10.1002/asi.21309.
[12] C. Chen, "Science Mapping: A Systematic Review of the Literature," *Journal of Data and Information Science,* vol. 2, no. 2, pp. 1-40, 2017, doi: 10.1515/jdis-2017-0006.
[13] N. Zhang, S. Yang, and P. Jia, "Cultivating Resilience During the COVID-19 Pandemic: A Socio-ecological Perspective," *Annu Rev Psychol,* vol. 73, pp. 575-598, Jan 4 2022, doi: 10.1146/annurev-psych-030221-031857.
[14] R. Bhamra, S. Dani, and K. Burnard, "Resilience: the concept, a literature review and future directions," *International Journal of Production Research*, vol. 49, no. 18, pp. 5375-5393, 2011, doi: 10.1080/00207543.2011.563826