



Public Health and Children's Subjective Well-Being

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Abstract

In recent years, the study of children's subjective well-being has garnered escalating global attention, with its research themes becoming increasingly diverse. However, this field still lacks a systematic review and analysis. Drawing upon the Web of Science database, this study retrieved 32,112 relevant articles published between 2003 and 2022, focusing on the theme of children's subjective well-being. After rigorous screening, 23,711 publications were ultimately retained for analysis. Utilizing bibliometric methods, this study conducted network visualization analysis across multiple dimensions, including countries, institutions, journals, authors, and keywords, aiming to comprehensively reveal the current research landscape of children's subjective well-being. Furthermore, theme modeling techniques were employed to delve into the patterns of theme evolution, and cluster analysis was conducted to categorize related themes. Through qualitative analysis, this study uncovered the developmental trajectory and future research directions in the field of children's subjective well-being. The findings indicate that, in the realm of children's subjective well-being research, developed countries such as those in Europe, America, and Australia have contributed over 30% of the research efforts, both in terms of publication volume and impact. Among them, the United States holds a leading position. The research themes have gradually evolved from an initial focus on the children themselves to exploring their surrounding environments and further delving into the psychological impacts and well-being of children amidst public health emergencies. Notably, the outbreak of the COVID-19 pandemic has prompted scholars to delve deeper into children's well-being, shifting the focus of research from mere exploration of mental health to a more nuanced investigation of psychological impacts. Looking ahead, areas such as public health, psychological impacts, and children's dietary health will emerge as crucial directions for future exploration in the field of children's subjective well-being research, offering significant potential for investigation.

Keywords Children's Subjective Well-Being · Systematic Review · Bibliometrics · Topic Modeling

Extended author information available on the last page of the article

1 Introduction

Children's subjective well-being refers to the subjective satisfaction and feelings of happiness that children have about their own lives (Casas & Rees, 2015). The study of children's subjective well-being is an important field in psychology and a significant development within the broader research on subjective well-being (Lee, 2022). Since the 1980s, research on children's subjective well-being has evolved from initial definitions and measurements to focusing on the intrinsic mechanisms and influencing factors of children's happiness. It has further diversified into various applied domains. The research focus has shifted from children themselves to encompassing family, social, and cultural factors. Moreover, research methods have diversified from single quantitative or qualitative approaches to the use of mixed methods (Bradshaw et al., 2007; Casas, 2019; Csikszentmihalyi & Hunter, 2003; Diener and Fujita, 1995; Main et al., 2019). The exploration of factors influencing children's subjective well-being has progressively broadened to encompass various aspects, including family environment, school education, and social relationships. Concurrently, researchers have begun to investigate disparities in children's well-being across different countries and cultural backgrounds, as well as the underlying reasons for these disparities (Borualogo & Casas, 2019, 2021; Main et al., 2019; Migliorini et al., 2019). In addition, researchers are also focusing on the long-term development of children's subjective well-being and the factors that influence it. They are exploring how education and family interventions can be utilized to enhance children's subjective well-being (Luo et al., 2021; Wang & Sohail, 2022). In recent years, with the outbreak of the COVID-19 pandemic, scholars have increasingly focused their research on the relationship between public health events and children's subjective well-being. However, there is currently a lack of systematic reviews specifically addressing children's subjective well-being, resulting in a dearth of conclusive summaries on the evolution of research themes in this field. This gap hinders our ability to grasp future research directions effectively. This paper aims to address this gap by conducting a comprehensive analysis of the literature on children's subjective well-being using bibliometric analysis methods over the past two decades. The study begins with a literature analysis to gain a comprehensive understanding of the research status of children's subjective well-being. Subsequently, topic modeling is conducted to identify latent themes within the literature, analyzing the quantity, evolution trends, and interrelationships of these topics. Clustering methods are employed to explore the similarities and differences among the literature, aiming to identify the hot topics and thematic evolution in this research field. By combining milestone events in the study of children's subjective well-being and employing qualitative analysis, this paper provides directions and insights for future research. Ultimately, the findings aim to inform decision-makers with better evidence for promoting children's well-being and guide further research endeavors.

2 Data & Methods

2.1 Data

Using the Web of Science database as our primary data source, we conducted a search by setting the search terms to "children's subjective well-being" or its synonyms and limiting the publication date range to 2003 to 2022. This yielded a total of 32,112 relevant articles. After careful screening, we narrowed down the selection to 23,711 articles specifically pertaining to children's subjective well-being for further analysis. Web of Science provides a larger collection of scientific publications compared to databases like Scopus, Derwent, China National Knowledge Infrastructure (CNKI), China Social Sciences Citation Index (CSSCI), and other extensive databases. This makes it a valuable source for bibliometric software to obtain general statistical data on publications (Chen et al., 2019; Dong et al., 2019; Perazzo et al., 2019). Therefore, the WOS database was selected as the source database for data retrieval, using the following search strategy: search query, TI=("children's subjective well-being") or AK=("children's subjective well-being") or AB=("children's subjective well-being"), to search for scientific literature published from 2003 to 2022, spanning nearly two decades (Fordyce, 1988; Rizvi & Hossain, 2017; Zhang & Chen, 2019), the final search yielded a total of 32,112 publications as of December 12, 2022. The search was further restricted to peer-reviewed articles published in English, excluding publications that did not involve children or adolescents or were not peer-reviewed articles based on the following criteria (Pei et al., 2022). Prior to the initial screening process, we did not define "subjective well-being" but accepted the authors' definition of the subjective well-being effect (Freitas, 2017; Ghent, 2011). After the screening process, a total of 23,711 relevant publications were retained. The data retrieval and collection procedures are illustrated in Fig. 1.

2.2 Methods

Bibliometrics is an interdisciplinary research method that integrates knowledge from multiple disciplines and utilizes information science and computer technology to quantitatively analyze, statistically analyze, visualize, and network analyze literature data. Its purpose is to uncover the underlying connections between publications, explore hotspots and trends within a field, discover patterns of knowledge evolution, and identify future research directions. Ultimately, bibliometrics provides scientific evidence to support scientific research and decision-making processes (Leydesdorff & Rafols, 2011). By analyzing and visualizing a large volume of literature, bibliometrics can reveal the cutting-edge dynamics, hot topics, and trends in academic research. It provides researchers with a more comprehensive and in-depth perspective, facilitating stronger collaboration and communication in academic research. Moreover, bibliometrics contributes to the advancement of disciplinary fields by promoting knowledge sharing and driving the development of research areas (Borner, 2010; Chen, 2004, 2017; Waltman et al., 2010).

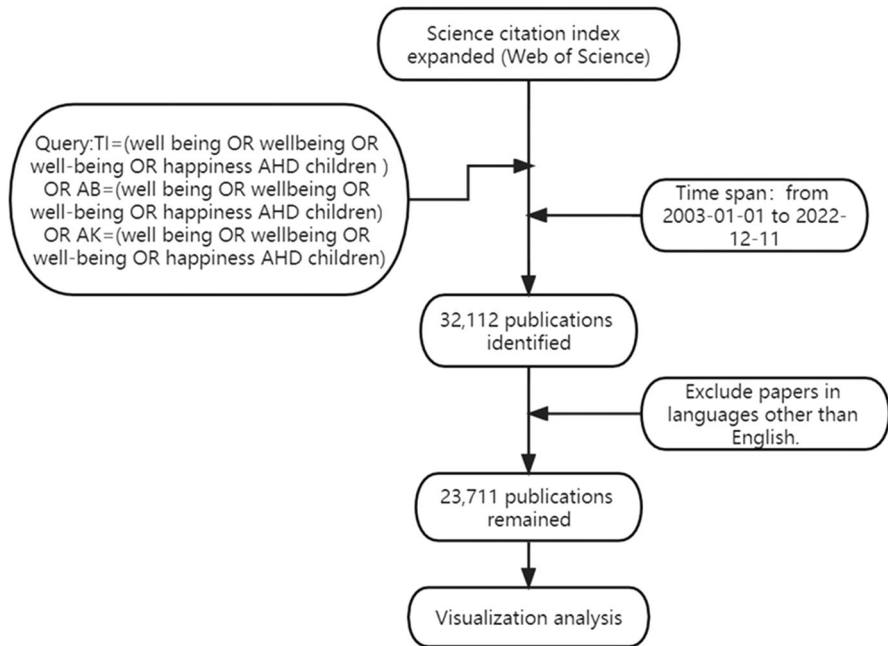


Fig. 1 Sample Selection Flowchart

This study initially employs various methods such as basic indicator analysis, network analysis, topic analysis, temporal-spatial analysis, and machine learning analysis. Using VOS viewer and Cite Space, it statistically analyzes and examines indicators such as the number of publications, authors, institutions, journals, and citations. It constructs co-citation networks of publications and collaboration networks among authors to explore citation relationships among literature and collaboration relationships among authors in the research on children's subjective well-being. It also investigates the research hotspots and evolution trends of the research topics.

Furthermore, topic modeling is conducted to uncover latent topics in the literature and analyze the quantity, evolution trends, and correlations among topics. Clustering methods are employed to cluster the literature, studying the similarities and differences between them. This study uses BERTopic, a topic model that extracts coherent topic representations by developing a class-based variant of TF-IDF. Compared to traditional LDA, BERTopic generates coherent topics and remains competitive in various benchmark tests involving classic models and recent topic modeling clustering methods (Grootendorst, 2022; Rauba, 2021).

Lastly, qualitative analysis is conducted to provide a deeper exploration of the results from quantitative analysis and to connect them with milestone events in the development of children's subjective well-being. This approach aims to identify future research directions.

3 Result

3.1 Country/Region

The number of publications and citations within a certain period can provide a visual reflection of the development speed and research popularity trends in a specific field of study (Qin et al., 2020). According to the geographic distribution on the Global Productivity Map shown in Fig. 2A, research papers on children's subjective well-being are predominantly published in countries and regions such as North America, Europe, Oceania, and Asia. Figure 2B displays the annual publication count related to children's subjective well-being research from 2003 to 2022, showing an increasing trend over the past two decades. Figure 2C illustrates the annual publication count in different countries/regions during the same period, indicating that the United States has the highest annual growth rate, followed by the United Kingdom and China. Table 1 presents the top ten countries/regions with the highest publication count in children's subjective well-being research, with the United States having the most publications, followed by the United Kingdom and Australia. Furthermore, the United States also has the highest citation count, significantly surpassing the second-ranked United Kingdom by a factor of 3.49. These data indicate that

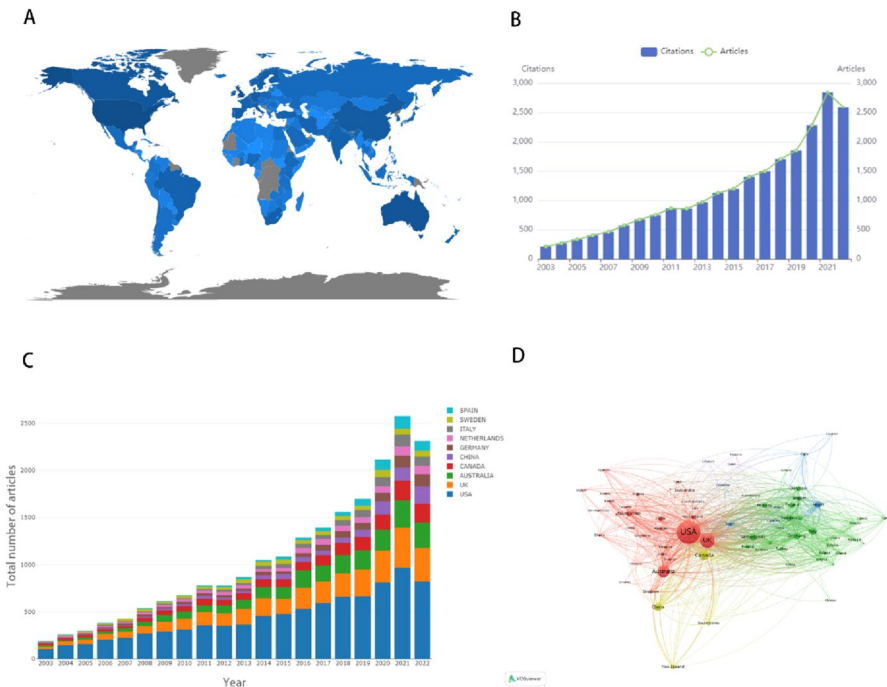


Fig. 2 **A**: Distribution of Publications by Region in the World (Darker colors represent a higher number of publications) **B**: Trends in Publication and Citation Volume over the Years. **C**: Trends in Publication Volume by Country. **D**: Collaborative Relationships between Countries

Table 1 Top Countries by Publication Count

Rank	Country	Articles	Proportion	Total Citations	Average Citations
1	USA	7875	33.21%	187890	23.86
2	UK	2698	11.38%	53764	19.93
3	AUSTRALIA	2018	8.51%	31437	15.58
4	CANADA	1292	5.45%	27502	21.29
5	CHINA	577	2.43%	10514	18.22
6	NETHERLANDS	554	2.34%	10448	18.86
7	GERMANY	578	2.44%	10169	17.59
8	ITALY	796	3.36%	10056	12.63
9	SPAIN	492	2.07%	8032	16.33
10	SWEDEN	340	1.43%	6022	17.71
11	FINLAND	480	2.02%	5813	12.11
12	SOUTH AFRICA	383	1.61%	5284	13.80
13	DENMARK	289	1.22%	5102	17.65
14	INDIA	255	1.08%	4120	16.16
15	ISRAEL	293	1.24%	4104	14.01
16	NORWAY	271	1.14%	3745	13.82
17	BRAZIL	356	1.50%	3608	10.13
18	IRELAND	194	0.82%	3576	18.43
19	NEW ZEALAND	173	0.73%	3549	20.51
20	TURKEY	161	0.68%	3210	19.94

the United States has the highest level of attention and abundant research achievements in the field of children's subjective well-being. The collaboration network between countries generated by VOS viewer, as shown in Fig. 2D, reveals close collaboration between countries with evident clustering effects. Notably, there is close collaboration between the United States and countries such as the United Kingdom and Australia, while China has close collaboration with Canada, South Korea, and New Zealand. Germany demonstrates close collaboration with countries such as the Netherlands, Italy, Sweden, Denmark, and Turkey.

3.2 Institutions

The research on children's subjective well-being involves contributions from 2,439 institutions. Table 2 presents the top ten research institutions in terms of publication count. The University of London and the University of Manchester in the UK, along with the University of California System in the US, are the top three institutions in terms of publication count. Although the UK institutions with high publication counts have an advantage over their US counterparts in terms of publication quantity, the citation count of the University of California System in the US far exceeds that of the UK institutions. This indicates that the US has a greater influence in the field of children's subjective well-being than the UK, ranking first in the world. The

Table 2 Top 10 Institutions by Publication Count

Rank	Institution	Country	Articles	Citations	Average Citations
1	University of London	UK	1324	37031	27.97
2	University of Manchester	UK	1270	3829	3.01
3	University of California System	USA	1044	41383	39.64
4	Harvard University	USA	802	24743	30.85
5	University of Toronto	Canada	655	16364	24.98
6	Pennsylvania Commonwealth System of Higher Education (PCSHE)	USA	601	21422	35.64
7	University System of Ohio	USA	563	13504	23.99
8	University of Michigan System	USA	530	11917	22.48
9	University of North Carolina	USA	525	12953	24.67
10	University of Texas System	USA	515	13161	25.56

top ten institutions in terms of publication count contributed 7,829 articles, accounting for over 33% of the total. An institution collaboration network diagram was generated using VOSviewer, highlighting institutions with at least five publications in a visual manner. As shown in Fig. 3, institutions are clustered into five clusters based on the degree of collaboration. The size of the nodes represents the publication count, and the connections between nodes indicate collaborative relationships between institutions. The collaboration clustering among institutions is apparent, with clusters indicating close collaboration. Most clusters show close institutional collaboration across countries, and the top ten institutions with high publication counts have stable collaboration networks.

3.3 Author

Table 3 presents the top ten authors in terms of publication count. Although they rank among the top ten, their publication counts are not outstanding. However,

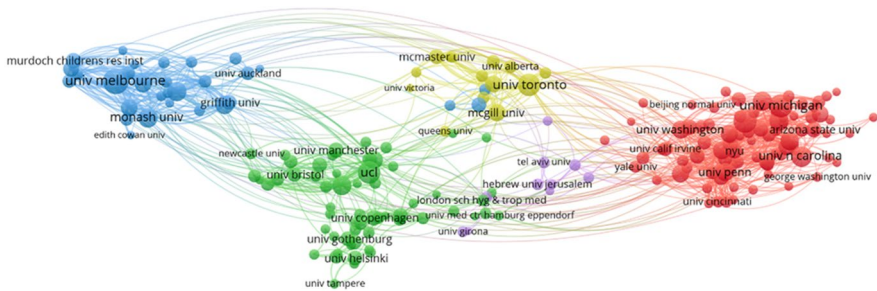


Fig. 3 Collaboration Relationships Among Institutions

Table 3 Top 10 Authors by Publication Count

Rank	Author	Articles	Institution	Country	Citations	Average citations
1	Turney, K	43	University of California System	USA	1648	38.3
2	Casas, F	21	Universidad Andres Bello	Chile	694	33.0
3	Jackson, DB	19	Johns Hopkins Bloomberg School of Public Health	USA	288	15.2
4	Giallo, R	19	Murdoch Children's Research Institute	Australia	714	37.6
5	Lee, J	18	Korea Institute of Science & Technology (KIST)	South Korea	102	5.7
6	Reynolds, AJ	17	Oregon State University	USA	959	56.4
7	Ben-Artch, A	16	Hebrew University of Jerusalem	Israel	776	48.5
8	Bradshaw, J	15	University of North Texas Health Science Center	USA	783	52.2
9	Cheng, TC	15	Wuhan Institute of Technology	China	247	16.5
10	Rees, G	14	University of Plymouth	UK	94	6.7

paths is closely related to the frequency of z-scored citations. There are essentially four major reference paths on the existing map. This means that research published in social/education/psychology journals often cites papers published in health/nutrition/environment/psychology journals (Table 4).

4 References

As shown in Table 5, the top 10 most-cited references are almost exclusively published in leading journals within the relevant fields. Among them, the journal with the highest impact factor score is the *Journal of the American Academy of Child & Adolescent Psychiatry*. The most-cited article is "Qualitative Research in Psychology," published in *Qualitative Research in Psychology*. Notably, most of the top 10 most-cited articles were published around the twentieth century, indicating that research on children's subjective well-being has already achieved widely recognized accomplishments in the last century and continues to serve as a valuable reference for current studies.

4.1 Keywords

Keyword co-occurrence analysis helps us understand the research hotspots and future directions in a particular discipline. By using VOSviewer to retrieve the top 20 keywords from the literature data and cluster them, we have identified established themes and emerging areas in the given research field. Table 6 presents the results. In the context of research on children's subjective well-being, "mental health" is the most frequently occurring keyword, followed by "quality of life." This insight suggests that when focusing on children's subjective well-being, researchers often emphasize their mental health and overall quality of life. Additionally, child welfare and parenting are also significant aspects of concern among researchers.

Figure 6A represents the keyword clustering diagram with a modularity Q of 0.8707 and an average silhouette score (s) of 0.9582, demonstrating strong clustering effects and a homogeneous network. All retrieved keywords from the literature were categorized into 24 clusters. The largest cluster is "#0 psychological well-being," indicating the significance of children's mental health when considering their subjective well-being. Figure 6B provides a temporal perspective on the evolution of research hotspots over time. The recent research hotspots include "#1 covid-19 pandemic," "#2 children's perspective," "#5 psychological distress," "#10 adverse childhood experience," "#16 physical activity," "#18 teacher-child interaction," and "#20 pregnant women".

Another important indicator of research frontiers, hotspots, and emerging trends is the intensity of keyword bursts (Fig. 7). Keywords such as "coronavirus disease," "social media," and "psychological impact" experienced bursts mainly between 2020 and 2022, indicating that these research areas have received significant attention in recent years.

Table 4 Top 100 Article Publication Counts

Rank	Journal	Count	IF(2021)	5 Year IF	JCR(2021)	Citations	Average citations
1	CHILDREN AND YOUTH SERVICES REVIEW	627	2.519	2.858	Q1	10,014	16
2	INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH	465	4.614	4.799	Q1	2907	6
3	CHILD INDICATORS RESEARCH	357	2.322	2.556	Q2	4650	13
4	CHILD ABUSE & NEGLECT	296	4.863	5.685	Q1	8319	28
5	BMC PUBLIC HEALTH	296	4.135	4.545	Q2	5313	18
6	FRONTIERS IN PSYCHOLOGY	260	4.232	4.426	Q1	2900	11
7	PLOS ONE	258	3.752	4.069	Q2	3461	13
8	JOURNAL OF CHILD AND FAMILY STUDIES	242	2.784	3.066	Q2	3016	12
9	JOURNAL OF MARRIAGE AND FAMILY	220	4.917	4.934	Q1	11,318	51
10	SOCIAL SCIENCE & MEDICINE	197	5.379	5.887	Q1	7132	36

Table 5 Top 10 Most Cited References

Rank	First author	Title	Year	Journal	IF	JCR	Total Citation
1	Braun, Virginia	Using thematic analysis in psychology(Braun & Clarke, 2006)	2006	Qualitative Research in Psychology	10.568	Q1	895
2	Robert Goodman	The Strengths and Difficulties Questionnaire: A Research Note(Goodman, 1997)	1997	J.Child Psychol.Psychiat	8.265	Q1	762
3	Nancy E. Reichman	Fragile Families: sample and design(McLanahan, 2001)	2001	Children and Youth Services Review	2.519	Q2	690
4	Radloff, L. S	The CES-D Scale: A Self-Report Depression Scale for Research in the General Population(Radloff, 1977)	1977	Applied Psychological Measurement	1.522	Q3	625
5	Hu, Li-tze	Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives(Hu & Bentler, 1999)	1999	Structural Equation Modeling: A Multidisciplinary Journal	6.181	Q1	621
6	Diener, Ed	The Satisfaction With Life Scale(Diener et al., 1985)	1985	Journal of Personality Assessment	3.72	Q2	439
7	Goodman, Robert	Psychometric Properties of the Strengths and Difficulties Questionnaire(GOODMAN, 2001)	2001	Journal of the American Academy of Child & Adolescent Psychiatry	13.113	Q1	399
8	Vincent J Felitti MD	Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults(Mary P Koss PhD; James S Marks MD; MPH, 1998)	1998	American Journal of Preventive Medicine	6.604	Q1	382
9	Ronald C. Kessler	The World Health Organization Composite International Diagnostic Interview short-form (CIDI-SF)(Wittchen, 1998)	1998	International Journal of Methods in Psychiatric Research	4.182	Q2	354
10	Baron, Reuben M	The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations(Baron and David, 1986)	1986	Journal of Personality and Social Psychology	8.46	Q1	318

Table 6 Total Article Keywords

Rank	Keywords	Occurrences	Rank	Keywords	Occurrences
1	mental health	938	11	child maltreatment	209
2	quality of life	786	12	qualitative research	205
3	subjective well-being	387	13	foster care	205
4	child welfare	362	14	child health	192
5	social support	322	15	health-related quality of life	183
6	child well-being	312	16	autism spectrum disorder	181
7	psychological well-being	260	17	child protection	154
8	physical activity	258	18	child abuse	152
9	life satisfaction	236	19	early childhood	140
10	child development	222	20	health promotion	138

4.2 Topic Analysis

Through topic modeling analysis of 23,711 articles using article titles, author keywords, abstracts, and publication years, 249 clusters representing different article topics were identified. Each article topic is associated with five highly relevant keywords. Continuing to utilize the GPT-4 model, the most representative article abstracts and topic keywords are used to help determine the labels for each topic. Table 7 displays the labels for the top ten topics:

Through topic clustering and correlation analysis, it was discovered that different topics exhibit strong associations. Considering the trends in publication volume over the years for different topics in the field of children's subjective well-being, the psychological impact of COVID-19 on adolescents is the latest research hotspot, with a sharp increase in related publications starting from 2019. Associated topics include the impact of HIV on children, the influence of refugee children, and the effects of war on families and children. These topics have shown a fluctuating upward trend in publication volume since 2004, but the overall trend is relatively moderate compared to the COVID-19 theme. The quality of children's lives is an important research direction, with related topics such as physical activity, oral health, and childhood obesity. The publication volume of these topics has also been increasing year by year. Topics related to family, maternal well-being, paternal involvement, and socioeconomic status are closely connected, indicating the influence of the family as a whole on children's subjective well-being, encompassing the respective roles of fathers and mothers (Fig. 8).

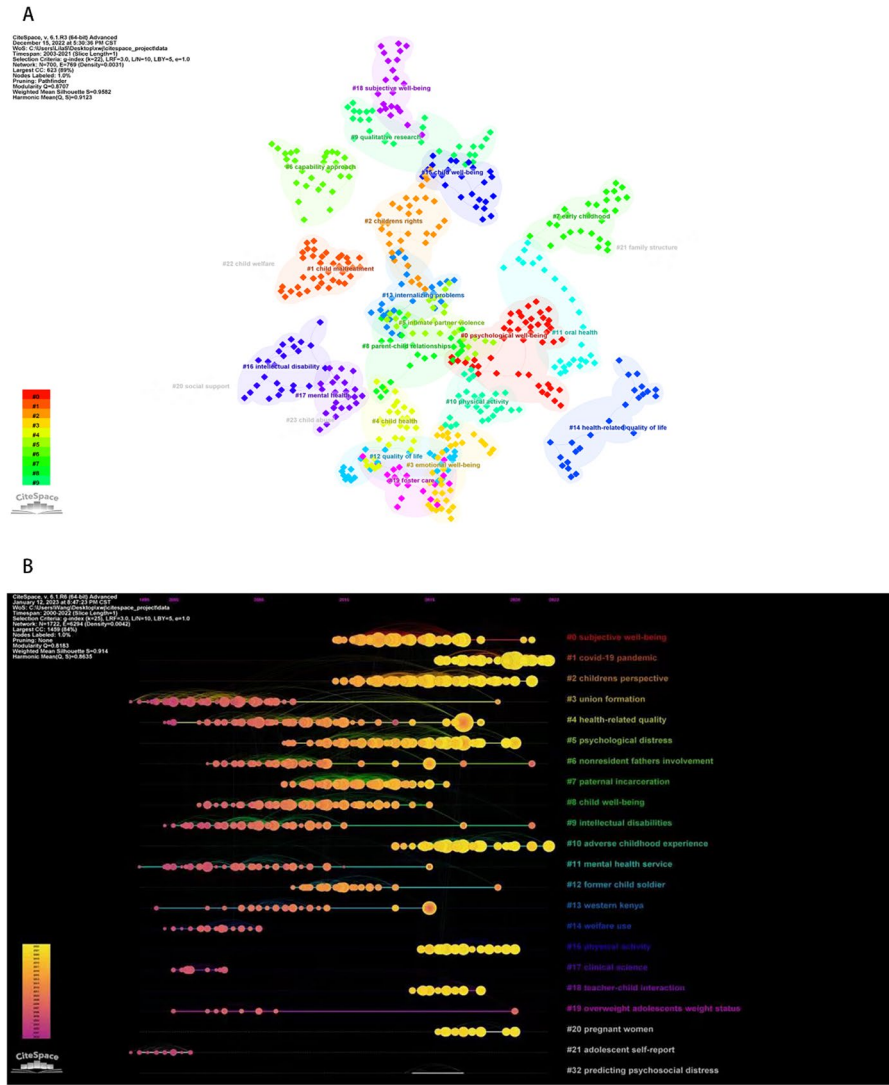


Fig. 6 A: Keyword Clustering; B: Evolution of Keywords over Time

5 Discussion

5.1 Global Research on Children's Subjective Well-being

Research on children's subjective well-being has received considerable attention and research investment in developed countries such as Europe, the United States, Australia, and Canada. These countries and regions contribute to over 30% of the publications and have a significant impact in terms of the quantity and influence

Top 25 Keywords with the Strongest Citation Bursts

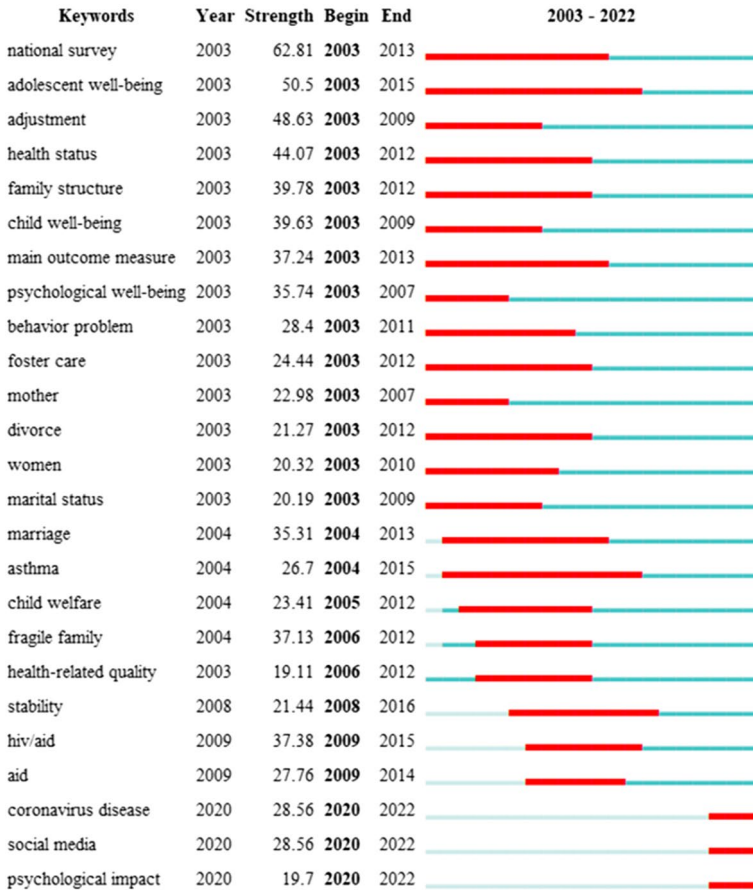


Fig. 7 Keyword Citation Explosion Graph

of their research output, with the United States being a leader in this field. Developed countries possess better education, healthcare, and social welfare systems, providing more resources and opportunities that positively influence children's subjective well-being. In China, research on well-being tends to focus on the elderly population, closely related to the issue of population aging. However, children are indeed regarded as the true measure of a nation's well-being (Adamson et al., 2007). The high level of attention given to children's well-being and mental health by a country reflects its emphasis on children's rights and future development, and it also reflects the overall level of development of a nation.

Table 7 Using GPT-4 to identify labels for each topic (top 10 topics)

Topic Number	Response	Keywords
0	topic: Psychological Impact of COVID-19 on Children and Adolescents	0_covid19_pandemic_lockdown_2020
1	topic: HIV Orphans and Caregiver Challenges	1_hiv_orphans_aids_hiv_aids
2	topic: Autism Interventions and Outcomes	2_autism_asd_autistic_spectrum
3	topic: Oral Health, Dental Caries, and Quality of Life	3_dental_oral_caries_ohrqol
4	topic: Childhood Cancer Survivors' Long-term Outcomes and Quality of Life	4_cancer_survivors_oncology_leukemia
5	topic: Maternal Depression, Anxiety, and Offspring Development	5_postpartum_ppd_epds_cortisol
6	topic: Electronic Devices and Children's Health	6_media_digital_internet_gaming
7	topic: Living Arrangements and Well-being of Elderly in China	7_elderly_older_filial_elders
8	topic: Indigenous Well-Being & Parenting	8_indigenous_aboriginal_torres_strait
9	topic: Adolescents' Subjective Well-Being and Psychometric Comparisons	10_sleep_bedtime_duration_night

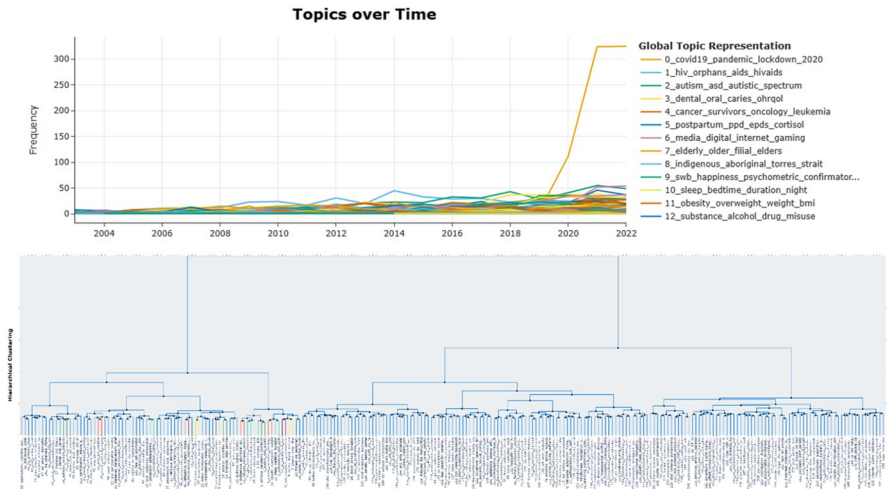


Fig. 8 Topic Modeling Results

5.2 Evolution of Themes in Children's Subjective Well-being

The research focus on children's subjective well-being has evolved from initially focusing on children themselves to exploring the surrounding environment and then delving into the impact of public health emergencies, further delving into the intrinsic mechanisms of children. Early research primarily concentrated on measuring children's well-being and their psychological health. Most quantitative studies included questions about psychological health and happiness as they are often key concepts in defining subjective well-being (Arola et al., 2023). With rapid socioeconomic development, research on children's subjective well-being has become more diverse, covering various aspects such as family, education, and socio-cultural factors. In terms of the family, researchers initially focused on parents, with research topics ranging from marital relationships to fathers' socioeconomic status and overlapping concerns for mothers, and the family structure of children has consistently been a focal point of research. Additionally, children's social relationships, including experiences of violence such as bullying and their interactions with neighbors, have also become subjects of researchers' attention (Bradshaw & Keung, 2011). In 2020, the global spread of the SARS-CoV-2 virus, leading to the COVID-19 pandemic, resulted in the rapid implementation of nationwide lockdown measures, drawing widespread attention to the impact on public health and, specifically, mental health. The global outbreak of the novel coronavirus also drew attention to the potential effects on children, prompting further research into the relationship between children and the pandemic, not only focusing on their physical health during this particular period but also their mental well-being (Klocke et al., 2013; Li et al., 2021; O'Neil et al., 2014). The developmental changes in children reflect their sense of connection with the environment and their social relationships with all individuals they come

into contact with, thus demonstrating the distinction between children's physical health and psychological well-being.

5.3 Public Health Emergencies and Psychological Impact

In 2020, the global outbreak of the COVID-19 pandemic had profound effects on society worldwide, significantly impacting children's lifestyles, including their schooling, social interactions, and recreational activities. This stimulated research on children's subjective well-being with a focus on the pandemic and its implications. It also prompted scholars to pay more attention and invest more in studying the psychological impact on children. Furthermore, as lockdown policies were implemented and online media further developed during the pandemic, social media and its impact on children's subjective well-being experienced a surge in research interest. The results of thematic analysis cluster the global public health emergency of the COVID-19 pandemic with themes such as the HIV virus, the SARS epidemic, war, and refugees. It was found that whether in the post-war recovery period or the period after viral outbreaks and pandemics, scholars shifted their focus from merely examining children's psychological health to studying the psychological impact on children after public health emergencies. This subtle shift in focus underscores the importance of addressing the psychological well-being of children or adolescents, whose minds and bodies are still in the process of development, following such sudden events. Children's cognitive and emotional regulation abilities are not yet fully developed, making them more vulnerable to harm and more likely to experience confusion, fear, or anxiety when faced with public health emergencies. They may struggle to understand and adapt to the changes brought about by such events. This psychological trauma not only affects short-term recovery but also has long-term implications that can impact their future well-being and functioning into adulthood.

5.4 Future Development of Children's Subjective Well-being

In the study of children's subjective well-being, the term "China" is closely associated with loneliness and aging. Considering China's national conditions and social development trends, the demographic characteristics of the Chinese population and the subjective well-being of the next generation are currently and will continue to be a research hotspot in the short term.

When considering the influence of fathers and mothers on children's subjective well-being, there has been a shift in focus from mothers, who have been the primary focus of scholars' research, to fathers. The increased frequency of the keyword "father" suggests that the role of fathers in children's development is worth further investigation. The clustering of keywords such as "neighbors" and "harm" indicates that neighbor relationships are also a potential direction for future research on children's subjective well-being.

Diabetes and obesity are closely related aspects of children's health and their subjective well-being. The thematic analysis reveals the repeated appearance of keywords such as "food," "breakfast," "feeding," and "nutrition," indicating that

diet and nutrition are important research areas in the study of children's subjective well-being. Many scholars have explored the relationship between children's dietary health, eating habits, and nutrition in relation to their growth and health (Gundersen & Ziliak, 2015; Nguyen et al., 2015; Priya Shankar et al., 2017). However, there is still limited research on the connection between these aspects and children's subjective well-being, making it a research direction worth further attention.

In the face of public health emergencies, the association between children's physical health, mental health, and psychological impact is currently a major research focus. In the fields of epidemiology, nutrition, and public health, there is still significant room for the development of research on children's subjective well-being.

6 Conclusion

This study systematically reviews the current research status and development trends in the field of children's subjective well-being through bibliometric analysis and topic modeling of 23,711 articles focused on this theme. Currently, research on children's subjective well-being has received considerable attention and investment in developed countries such as Europe, the United States, Australia, and Canada, with the United States emerging as a leader in this area. The scope of research on children's subjective well-being has gradually expanded from an initial focus on the children themselves to an exploration of their surrounding environments, and further into the investigation of the psychological impacts and well-being of children during public health emergencies. In particular, the COVID-19 pandemic has sparked profound reflections among scholars on children's well-being, shifting the focus of research from mental health exploration to an examination of psychological impacts. Looking ahead, areas such as public health and psychological impacts, as well as children's dietary health, are expected to emerge as significant directions in the study of children's subjective well-being, offering high exploratory value. This research provides a valuable reference for deepening our understanding of children's subjective well-being and guiding future studies.

However, it is important to acknowledge the limitations of this study. As the research data was cut off on December 12, 2022, the incomplete observation of data from 2022 may introduce biases into the analysis and predictions. Based on the findings of this study, there is potential for future systematic reviews on children's subjective well-being to supplement the data aspect. Additionally, more specific and in-depth research can be conducted on the intersection of public health and children's well-being.

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Writing –review & editing; Hua Fan contributed to Visualization; Prof. Yijun Bao contributed to Writing –review & editing; Xin Shi contributed to Conceptualization and Funding acquisition.

Data Availability All the data of this study come from the Web of Science database. We collected the subject words of all relevant literature by setting the search term as "children's subjective well-being" or its synonyms and limiting the publication date range from 2003 to 2022.

Declarations

Conflict of Interest We have no known conflict of interest to disclose.

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