

Global Trends and Issues in Child Marriage Research: Bibliometrics and Content Analysis

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Abstract

The practice of child marriage (CM) has become a significant global concern, severely impacting children's well-being. This study employs bibliometric analysis and content analysis to identify global publication trends on CM and effectively address the research gaps in this field. The study used the Scopus database from 1994 to 2021. This research can be seen from the number of publications and citations that tend to increase. The United States, India, and the United Kingdom are the countries with the most influential authors, affiliates, articles, and publication performance. Compared with the three countries, not many authors from Asia have been published on the topic; however, some countries in Asia have more child marriages. This research review shows that articles on CM mainly discuss the drivers and impacts of CM and its intervention efforts. With traditional and cultural practice, health, and reproductive rights, CM is related to human rights and the effects of CM intergenerational relationships. This study suggests that future research focuses on (i) CM policies, (ii) the participation and agency of the child to reduce CM, and (iii) CM with refugees for humanitarian context as a matter of CM occurring.

Keywords

Bibliometric analysis; child marriage; content analysis; future research

Introduction

Child marriage (CM) is a global development issue that harms children's health, welfare, and human rights (Arthur et al., 2018; Bokaie et al., 2021). Globally, more than 650 million married girls and women have married before age 18, formally and informally (Lendhardt et al., 2016). Geographically, most of these cases occurred in Sub-Saharan African countries, South Asia (Wahyudi et al., 2019), the Middle East and North Africa (Shaheen et al., 2022), and Southeast Asia and Papua New Guinea (Yaya et al., 2019).

Several studies examine the factors that influence CM (Efevbera et al., 2019; Harvey et al., 2022; Mobolaji et al., 2020; Mulenga et al., 2018; Pacheco-Montoya et al., 2022; Yaya et al., 2019) while other studies discuss the impact of CM (Edmeades et al., 2022; Efevbera & Bhabha, 2020; Fakir et al., 2016; Garcia-Hombrados, 2022; Godha et al., 2013; Greene & Siddiqi, 2021; Joamets & Sogomonjan, 2020; John et al., 2019; Malhotra & Elnakib, 2021; Paul, 2020; Petroni et al., 2019) and efforts to prevent CM (Batyra & Pesando, 2021; Bunting, 2005). However, such efforts have not yielded satisfactory results because the problem of CM is very complex and requires a specific and comprehensive approach. There were previous studies have been conducted on CM using the systematic literature review method (Fan & Koski, 2022; Greene & Siddiqi, 2021; Zaman & Koski, 2020), but very few studies have been conducted using bibliometrics to map trends and publications on CM.

This study makes noteworthy contributions to the existing literature. Firstly, it investigates annual trends in research output, analyzing publication patterns within this field. Secondly, it identifies key contributors to CM research by utilizing bibliometric data on authors, countries of origin, institutions, and source titles. Thirdly, this analysis maps the intellectual structure of the field, pinpointing main themes through the co-occurrence of author keywords. Additionally, it highlights the top ten research papers on CM, including those with the highest citation counts. Fourthly, the study's findings are valuable to many stakeholders, including policymakers, decision-makers, society, parents, and academics. Understanding the drivers and impacts of CM necessitates further investigation and intervention. This study aims to describe 1) how the performance of CM publications is based on authors, papers, sources, affiliations, and countries, 2) what the main prevalent themes of CM publications between scholars are, and 3) what the future research direction is related to CM.

Materials and methods

This study employs bibliometric analysis and content analysis to provide a comprehensive overview of global publication trends on CM and to identify research gaps in the field. Bibliometric analysis is precious in this context because it quantitatively evaluates the performance of a research publication, thereby offering an objective measure of scholarly attention and influence in the field of CM research.

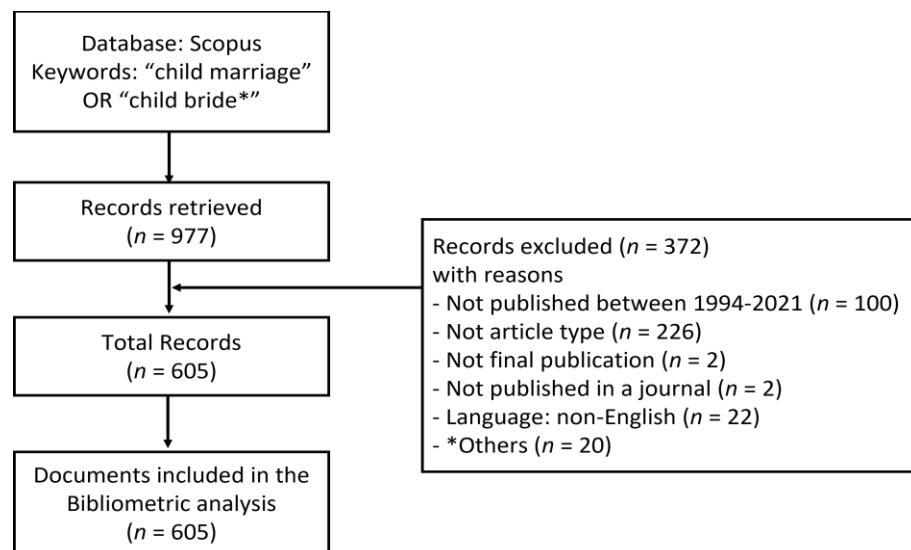
Bibliometric methods such as citation analysis and co-occurrence mapping were chosen to systematically draw publication networks and trends. Citation analysis helps understand the impact of specific articles, authors, and journals, and co-occurrence mapping is used to identify trending topics and future research directions based on author keywords. These methods collectively reduce researcher subjectivity and provide a clear picture of the research landscape (Cobo et al., 2011; Della Corte et al., 2019; Tranfield et al., 2003).

This study used the steps proposed by Zupic and Čater (2015), determined by conducting a literature review related to the research topic and then formulating questions that will be answered through bibliometric analysis. Thus, content analysis complements bibliometric analysis by offering an in-depth understanding of the context and thematic concerns in CM research. This dual-method approach ensures a robust analysis, addressing both quantitative and qualitative aspects of the research trends.

Data collection

We used the Scopus database on March 30, 2022, to search for publications related to CM research. The Scopus database was used for its recognition as the largest and most comprehensive academic literature database (Mansour et al., 2022), covering STEM, social sciences, and arts disciplines (Phuong et al., 2023). Many studies have used Scopus for bibliometric analyses (Abuhassna et al., 2023; Akpan & Ezeume, 2022; Fahimnia et al., 2015). Our data collection focuses on the keywords “child marriage” OR “child bride*” to maintain a specific scope. Including “early marriage” and “forced marriage” may introduce inconsistencies. CM refers to a marriage where one or both of the bride and groom are under 18 years of age following the Convention on the Rights of the Child (Efevbera & Bhabha, 2020), while early marriage sometimes describes a marriage where one or both of the bride and groom are 18 years of age or older but unable to give full consent. The search was limited to articles published between 1994 and 2021, written in English, and published in peer-reviewed journals. The starting point of 1994 was chosen because the International Conference on Population and Development (ICPD) held that year marked a significant global commitment to addressing issues related to the health and well-being of girls, including the recommendation to ban CM (United Nations Population Fund [UNFPA], 2004).

Figure 1: The Stages of Data Extraction



*Note: *Others include duplicates and studies outside of child marriage*

Then, we clean up the keywords with the same meaning but different word forms, letter arrangements, different types of words (plural or singular), or words with or without abbreviations. The data cleaning process was assisted by the open refine application. The results of data cleaning excluded 372 documents; thus, the documents eligible for analysis

were 605. The stages of data extraction can be seen in Figure 1. The extracted data from 1994–2021 showed that 605 articles from 357 journals were written by 1,565 authors, both individual authors (172 people) and collaborations (1,393 people). The articles have 938 keywords that can be processed. The extraction results can be described in Table 1.

Table 1: Result Description

Description	Result
Timespan	1994–2021
Sources(Journals)	357
Documents/articles	605
Average years from publication	5.52
Average citations per document	10.5
Author's Keywords (DE)	938
Authors	1,565
Authors of single-authored document	172
Authors of multi-authored document	1,393
Co-authors per document	3.33
Collaboration Index	3.36

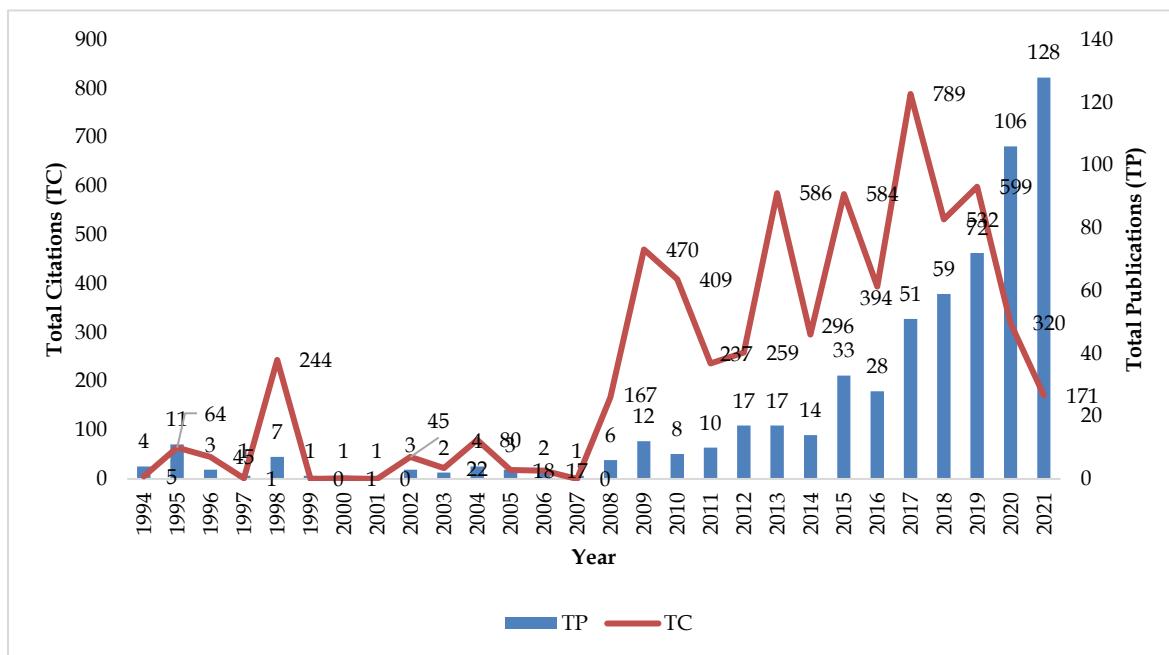
Note: DE = Descriptors

Data analysis

The research question is being addressed using bibliometrics methods such as citation analysis, co-occurrences, and content analysis. Citation analysis describes the performance of a document, sources, affiliation, author, or country on a particular research topic based on the number of citations and publications (Ellegaard & Wallin, 2015). Co-occurrences describe map topics, trends, and future research based on author keywords. Content analysis was employed further to explore the publications' thematic concerns and theoretical underpinnings. The co-occurrences threshold was set to five, and unlinked keywords and country/region names were excluded. The final dataset consisted of 938 keywords, with 95 appearing at least five times. Five keyword clusters were formed for analysis by setting the number of cluster members to at least ten keywords.

Results

Publication and citation trends in CM publications fluctuate yearly, but an increasing trend begins in early 2018 and continues until 2021. Most publications occurred in 2021, with 128 articles. A similar condition occurred in the number of CM citations per year, as shown in Figure 2. Most citations to CM publications occurred in 2019, with 599 citations. At the same time, minor citations or no citations occurred in 1999, 2001, and 2007.

Figure 2: The Trend of Citation and Publication in Child Marriage Per Year

The most influential and productive authors

Author performance in CM publications was grouped into two criteria: productive author based on Total Publications (TP) and influential author based on Total Citations (TC). Table 2 and Table 3 show that Raj, A., and Silverman, J. G., were the most productive and influential authors on topics related to CM. Of the 1,560 authors on CM, only 29 met the criteria of at least five co-appearances. Based on their performance, four authors, Raj, A., Silverman, J. G., Wodon, Q., and McDougal, L., were the most productive and influential in CM. However, Raj, A. was the most influential author compared to others; they produced 26 articles with 689 citations.

Table 2: The Top Ten Productive Authors in Child Marriage

Author Name	Affiliation	Country	TP	Rank
Raj, A.	University of California, San Diego	United States	26	1
Silverman, J. G.	UNICEF	India	12	2
Wodon, Q.	Johns Hopkins Bloomberg School of Public Health	United Kingdom	11	3
McDougal, L.	Population Council Headquarters	Canada	9	4
Amin, S.	London School of Hygiene & Tropical Medicine	Bangladesh	8	5
Cappa, C.	Harvard T.H. Chan School of Public Health	South Africa	8	6
Cislaghi, B.	Emory University	Ethiopia	7	7
Gage, A. J.	Universiti Malaya	Australia	6	8
Horii, H.	Addis Ababa University	Indonesia	6	9
Koski, A.	Harvard Medical School	Turkey	6	10

Note: TP=Total Publications

Table 3: The Top Ten Influential Authors in Child Marriage

Author Name	Affiliation	Country	TC	Rank
Raj, A.	University of California, San Diego	United States	689	1
Silverman, J. G.	UNICEF	India	493	2
Gage, A. J.	Tulane University	United States	292	3
Wodon, Q.	Johns Hopkins Bloomberg School of Public Health	United Kingdom	217	4
Nasrullah, M.	Bielefeld University	Germany	158	5
Zakar, R.	Institute of Social and Culture Studies University of Punjab	Pakistan	158	6
McDougal, L.	Population Council Headquarters	Canada	133	7
Zakar, M. Z.	Institute of Social and Culture Studies University of Punjab	Pakistan	127	8
Yount, K. M.	Emory University	United States	120	9
Koski, A.	University of California, San Diego	United States	101	10

Note: TC=Total Citations

The most influential papers

The ten most cited papers, listed in Table 4, range from 101 to 207 citations. The Lancet published a cross-sectional, observational study by Raj et al. (2009) with the highest number of citations in 2009. The top ten articles discussed the prevalence of CM (Raj et al., 2009) and the impact of CM on health (Azzopardi et al., 2019; Erulkar, 2013; Godha et al., 2013; Raj et al., 2010), economics (Parsons et al., 2015) and social (Fuller & Narasihman, 2008; Kaufman & Uhlenberg, 1998) as well as efforts to prevent CM (Erulkar & Muthengi, 2009; Lee-Rife et al., 2012). The location of the studies was mostly in South Asian countries.

Table 4: The Ten Most Cited Papers

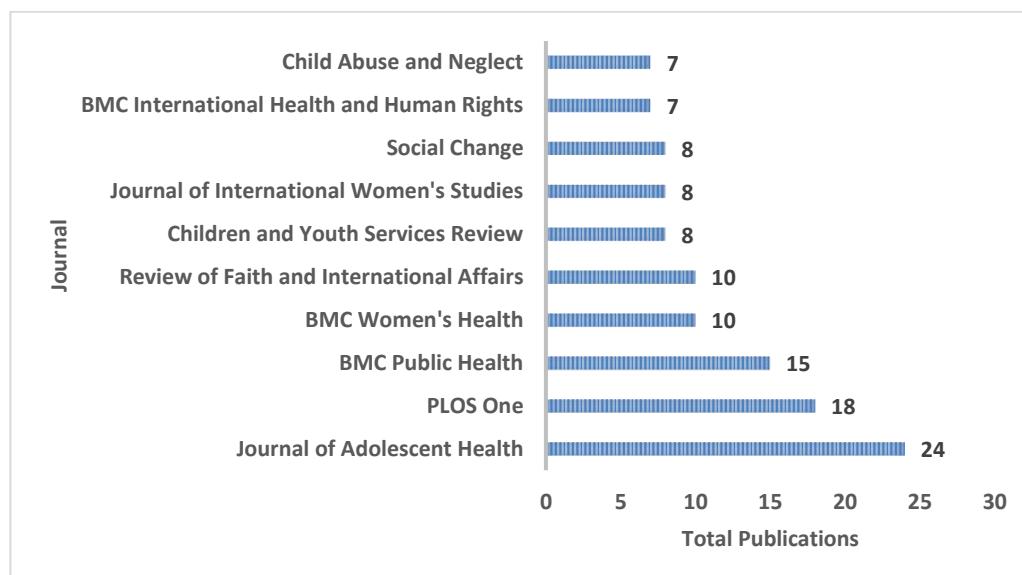
No.	Author	Title	Pub. Year	Source	Cited
1	Raj et al., 2009	Prevalence of child marriage and its effect on fertility and fertility-control outcomes of young women in India: a cross-sectional, observational study	2009	The Lancet	207
2	Kaufman & Uhlenberg, 1998	Effects of life course transitions on the quality of relationships between adult children and their parents	1998	Journal of Marriage and Family	204
3	Godha et al., 2013	Association between child marriage and reproductive health outcomes and service utilization: A multi-country study from South Asia	2013	Journal of Adolescent Health	137
4	Raj et al., 2010	The effect of maternal child marriage on morbidity and mortality of children under 5 in India: Cross-sectional study of a nationally representative sample	2010	BMJ (Online)	136

No.	Author	Title	Pub. Year	Source	Cited
5	Erulkar & Muthengi, 2009	Evaluation of Berhane Hewan: A program to delay child marriage in rural Ethiopia	2009	International Family Planning Perspectives	113
6	Erulkar, 2013	Early marriage, marital relations, and intimate partner violence in Ethiopia	2013	International Perspectives on Sexual and Reproductive Health	106
7	Fuller & Narasihman, 2008	Companionate marriage in India: The changing marriage system in a middle-class Brahman subcaste	2008	Journal of the Royal Anthropological Institute	106
8	Lee-Rife et al., 2012	What Works to Prevent Child Marriage: A Review of the Evidence	2012	Studies in Family Planning	105
9	Parsons et al., 2015	Economic Impacts of Child Marriage: A Review of the Literature	2015	Review of Faith and International Affairs	101
10	Azzopardi et al., 2019	Progress in adolescent health and wellbeing: tracking 12 headline indicators for 195 countries and territories, 1990-2016	2019	The Lancet	101

The leading journal in CM publications

From 1994 to 2021, the top ten journals published 125 CM-related publications, or 20.66% of the total (605 articles). Figure 3 shows that the most productive journal is the Journal of Adolescent Health, with 24 pieces, followed by PLOS One, with 18 articles, and BMC Public Health, with 15 reports. Most of the top ten journals focus more on health than any other field.

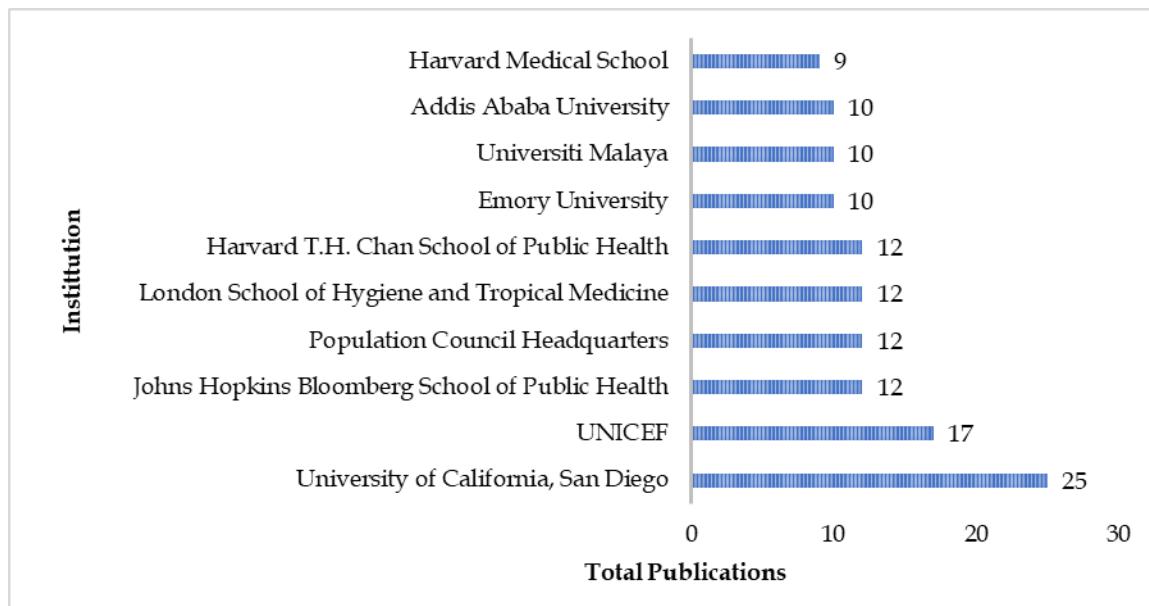
Figure 3: The Top Ten Journals Based on a Total Publication From 1994 to 2021



The top ten contributing institutions in CM publications

Figure 4 shows that the institution that published the most articles on CM from 1994 to 2021 is the University of California, San Diego, with 25 articles. Raj A. and Koski A., both from the University of California, San Diego, were ranked among the top ten most productive and influential authors.

Figure 4: The Top Ten Institutions Based on a Total Publication from 1994 to 2021



The top ten contributing countries in CM publications

The top three most productive and influential countries are the United States, India, and the United Kingdom. However, the United States leads all other countries in publications and citations. With 214 publications and 3,492 citations, Table 5 demonstrated that the United States was the most productive and significant country in CM research.

Table 5: The Top Ten Contributing Countries to Child Marriage

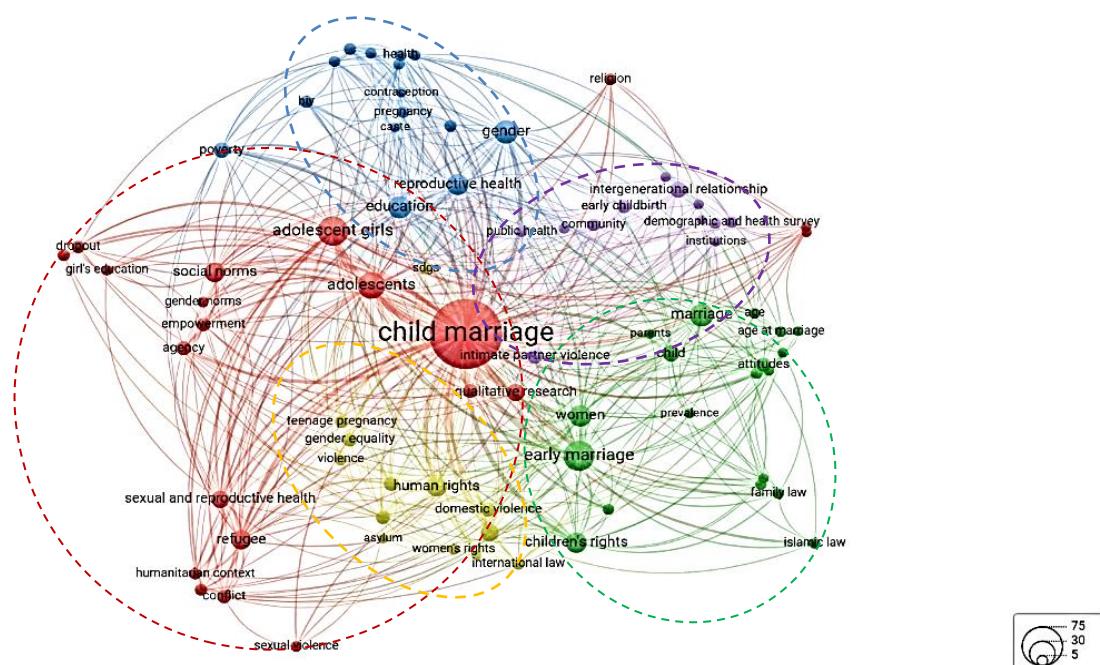
Country	TP	Rank	Country	TC	Rank
United States	214	1	United States	3,492	1
India	86	2	United Kingdom	1,143	2
United Kingdom	81	3	India	1,014	3
Canada	45	4	Canada	572	4
Bangladesh	32	5	Bangladesh	378	5
South Africa	29	6	Belgium	249	6
Ethiopia	27	7	Ethiopia	248	7
Australia	24	8	Germany	198	8
Indonesia	16	9	Australia	194	9
Turkey	8	10	South Africa	158	10

Note: TP = Total Publications; TC = Total Citations

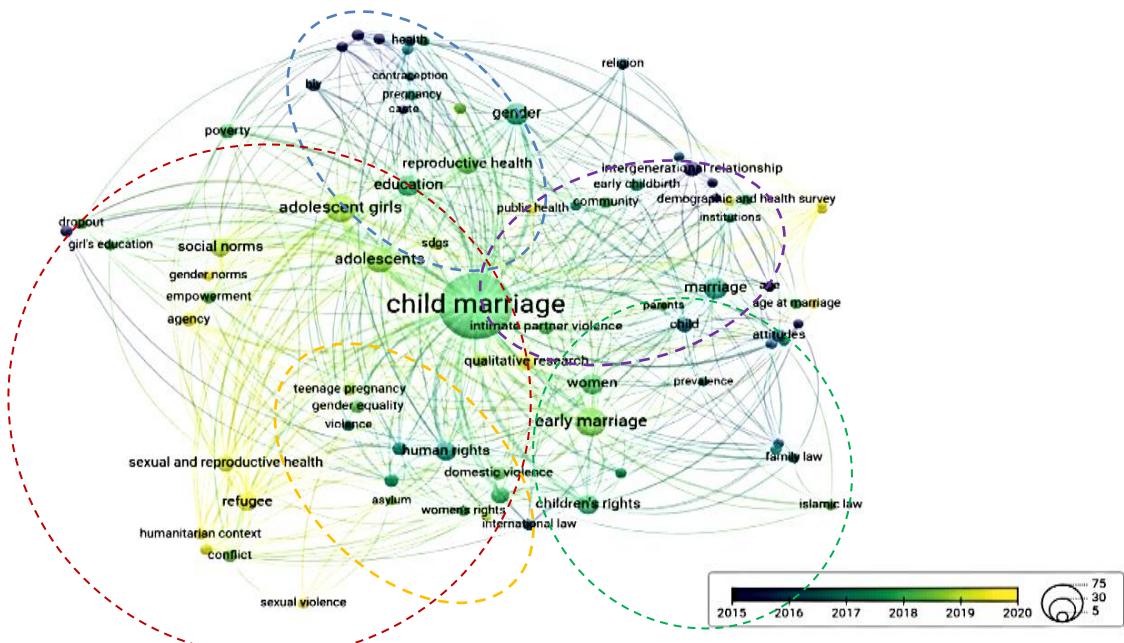
The most frequent keywords in CM publications

Keywords describe an article's topic, central idea, or critical topic of a particular research field (Ranjbari et al., 2021). After cleaning, we had 938 keywords; we excluded 15 that showed the region's name and keywords with a co-occurrence frequency below five. Thus, 80 keywords could be mapped, as seen in Figures 5 and 6. The circles (nodes) represent specific keywords or topics, and the size of the circles (nodes) shows the number of co-occurrences, while the link size shows the number of networks. Based on Figure 5, the ten keywords with the highest co-occurrence frequency are: child marriage (244), early marriage (45), adolescent girls (43), youth (35), gender (27), marriage (26), education (25), women (23), reproductive health (22), and children's rights (21). These keywords are grouped into specific themes, or clusters based on their relatedness. Figure 5 shows five clusters of CM publications, each marked by red, green, yellow, blue, and purple dotted circles, representing different thematic areas within the research.

Figure 5: Thematic Cluster of Child Marriage Publication



The visualization overlay on the Vosviewer mapping results (Figure 6) shows the publication trend of keywords based on the year of appearance. The lighter the color of the link and circle, the more recent the publication. Keywords from recent publications, such as humanitarian context, refugee, sexual and reproductive health, agency, gender norms, and public health are particularly notable. Many of these recent keywords are concentrated in cluster 1, highlighted by the red dotted circle, indicating their significant presence in recent research.

Figure 6: The Trends of the Child Marriage Publication by Year

Discussions

This study provides a comprehensive overview of global publication trends on CM and identifies research gaps using bibliometric and content analysis. The findings highlight key authors, influential papers, and trending topics in the field, contributing to a better understanding of the scholarly landscape surrounding CM. The findings indicate a growing interest in this critical issue, particularly in regions with high prevalence rates, such as South Asia and Sub-Saharan Africa.

Regarding publication performance, the most influential authors, affiliates, and papers come from three central countries: the United States, India, and the United Kingdom. This is partly due to limited analysis of English-language articles in peer-reviewed journals. This creates a bias against English-speaking countries and ignores valuable research in non-English languages and non-peer-reviewed sources. In addition, this finding points to greater academic and resource excellence in the three countries but also illustrates research disparities within the affected regions. Compared with the three countries, few authors from Asia have published on the topic; however, some Asian countries have more CM, such as Bangladesh (Field & Ambrus, 2008) and Nepal (Maharjan et al., 2019). Therefore, it is vital to provide support through collaboration and investment of resources to increase research capacity in the affected areas and produce practical recommendations.

Raj et al. (2009) had the most significant and influential paper on the CM topic with 207 citations, which gave recommendations about the importance of policies to prevent CM, enhance education access, and support families and husbands in family planning because of their research findings that almost half of the women aged 20–24 experienced CM in India, resulting in high birth rates, close child spacing, and high unwanted pregnancies due to the lack of contraceptive use.

Thematic cluster in CM publication

The drivers and impacts of CM and its intervention efforts

Cluster 1 (red circle) is a group of publications focused on CM and its related issues, such as sexual and reproductive health (42), social norms (19), refugee (19), agency (10), girls' education (6), inequality (5), global health (10), and religion (7). The articles in this cluster primarily discuss the drivers, impacts, and interventions related to CM. Key drivers include social norms, poverty, lack of agency, lack of opportunity, pregnancy/fear of pregnancy (Psaki et al., 2021; Sabbe et al., 2013; Yüksel & Koçtürk, 2021), tradition and culture (Mrayan & Obeisat, 2021), and technology (Lailulo et al., 2015). Conflict and displacement are also identified as drivers in some regions, such as the Middle East (Elnakib et al., 2021). Additionally, some articles highlight the adverse effects of CM on children's mental and physical health (Khanna et al., 2021), including sexual abuse and violence (Sharma et al., 2020), and the need for interventions such as education, empowerment, and suffrage to protect children's rights (Saleheen et al., 2021; Taylor et al., 2019). The paper that discusses drivers, impacts, and interventions focuses more on girls than boys. CM violates the human rights of both genders even though the risks and consequences experienced are different due to biological differences and social norms (Edmeades et al., 2022). Therefore, CM intervention and prevention must also pay attention to boys (Biswas et al., 2020).

The keywords in this cluster also indicate that conflict, refugee, and humanitarian contexts, agency, and gender norms are still areas of research interest for researchers. However, further research is also needed on the advantages and disadvantages of involving children in organizations for child protection.

CM with traditional and cultural practices

Cluster 2 (green circle) examines the relationship between CM and traditional and cultural practices. Key topics include children's rights (21), attitudes (10), culture (7), family law/culture (6), gender inequality (6), Islamic law (6), traditional and cultural practices (6), parental support (5), and policies (5). Studies have shown that traditional and cultural traditions and religious beliefs can support CM and make it difficult to prevent (Melnikas et al., 2020; Mobolaji et al., 2020). Challenges in enforcing marriage laws exist in patriarchal societies like Indonesia and Israel (Allassad Alhuzai, 2020; Grijns & Horii, 2018). In Muslim-majority countries, enforcing the age restriction rule of marriage at 18 is also challenging (Ebetürk, 2021; Joamets & Sogomonjan, 2020). One study by Schaffnit et al. (2019) in this cluster found that CM is considered a tool to gain social status in rural Tanzania. In another study, Nisa (2020) found that CM in Indonesia is related to poverty and lack of education and a trend among middle-class urban youth who align honor with piety to justify early marriage. Policy interventions to eliminate CM have not protected children from these traditional and cultural practices that harm children's rights (Bhowmik et al., 2021; Joamets & Sogomonjan, 2020). Efforts to prevent CM at the community level can include a sociocultural approach, such as socialization/campaigns to mobilize the community by involving family support and community leaders and collaboration between government and related agencies (Asghari, 2019). Furthermore, the intervention must overcome social and cultural norms and beliefs that encourage CM (Mobilaji et al., 2020).

Health and reproductive rights

Cluster 3 (blue circle) focuses on the relationship between CM and reproductive health and rights. This cluster has topics such as education (25), reproductive health (22), HIV (8), family planning (7), maternal health (7), health (7), pregnancy (7), maternal and child health (6), fertility (6) abortion (5), and contraception (5). Research has shown that countries with high rates of CM also have high maternal and infant mortality (Kenny et al., 2019; Maharjan et al., 2019; Raj & Boehmer, 2013). CM can lead to limited reproductive knowledge, limited autonomy for women, and risky pregnancies. One study in this cluster by Kidman (2017) found that women who marry young have a higher risk of experiencing physical or sexual abuse by their partners. Another study by Adedokun et al. (2016) found that age at first marriage, current age, education attainment, and household decision-making significantly affect maternal health risks among young mothers in Nigeria. Addressing these concerns requires the provision of reproductive health education (Likupe et al., 2021; Maharjan et al., 2019), adequate maternal health services, access to contraception, legalization of abortion, and efforts to reduce CM (Potts & Henderson, 2012).

CM is related to human rights

CM is related to human rights violations, as seen in Cluster 4 topics (yellow circle), such as human rights, gender equality, domestic violence, and forced marriage. Studies have shown that CM puts children in a weak decision-making position (Baysak et al., 2021; Mondal & Paul, 2021; Tomar et al., 2021) and can lead to violence from partners (Kidman, 2017; Nasrullah et al., 2014). The violence is physical, sexual, economic, or emotional abuse (Amoah et al., 2021; Wahi et al., 2019). The results of a study in Palembang, South Sumatra, Indonesia, show that there are three different ways in which women's rights are violated in CM situations: the violations of their economic, human, and reproductive rights (Barkah et al., 2022). Additionally, other studies in this cluster provide several solutions for preventing CM, including increasing participation and gender equality, reforming regulations and policies (Warria, 2019), empowering young girls through education (Islam et al., 2021), and socioeconomic programs (Warria, 2019) and agencies (Horii, 2020). These measures are necessary to decrease early CM and remove gender norms contributing to the problem.

CM and intergenerational relationships impact

Cluster 5 (purple cluster) discusses CM and its impact on intergenerational relationships. Keywords include early childbirth (9), intergenerational relationships (3), son preference (7), the under-five mortality rate (8), and well-being (5). Studies have found adverse effects on the growth, well-being, and health of children born from CM (Efevbera et al., 2017; Wodon, 2016). These effects can be seen in Africa, where babies born from CM have a higher risk of anemia (Anjorin & Yaya, 2021). The cycle of anemia at the age of under five years is passed down from generation to generation (Efevbera et al., 2019). Papers by Allendorf et al. (2021) and Elnakib et al. (2021) showed how attitudes toward marital timing and displacement contribute to CM. Factors such as societal norms, sexual activity, and fear of premarital sex also play a role in the age of CM (Misunas et al., 2021). Health promotion interventions and guidance from medical professionals are needed to prevent CM from becoming a public health issue.

Future research trends

This paper aims to enhance the understanding of CM as a global issue. It uses bibliometric and content analysis to provide comprehensive insights into CM. As a result, the data set for this study provides a rich basis for analysis that is important for further research on CM. The bibliometric study shows that the essential keywords often appear in CM publications over 25 years; however, there are some gaps across the important keywords discussed in content analysis. As discussed above, the articles had many interesting findings that are important for further research.

Further analysis of CM policy

The marriage age policy's effectiveness depends on various variables, including culture, governmental restrictions, and regional geography (Batyra & Pesando, 2021). Changing the minimum age for marriage law is ineffective in limiting early marriage without better enforcement and monitoring. Moreover, the CM policies of each region were diverse and unique; therefore, appropriate procedures should be introduced separately for each region/local specific (Tresiana & Duadji, 2021). In addition, Maiden (2021) offered a combination of political and cultural power that tribal chiefs in Sub-Saharan African countries have in carrying out cultural change. Implementing countries and traditional policy support to increase the effectiveness of preventing CM is still limited (Muriaas et al., 2019). Therefore, we view the importance of future research discussing policies related to CM with different cultural and geographical backgrounds, enforcement, monitoring mechanisms for implementing regulations, and the practice of legal exceptions and gender discrimination (Arthur et al., 2018).

Children's participation and agency to reduce the CM

Giving trust to girls is seen as an effort of empowerment to overcome CM problems (Bessa, 2019; Crandall et al., 2016). However, providing the chance for children to participate in the organization is essential to provide knowledge on the impact of CM and ensure child protection (Kenny et al., 2019; Lokot et al., 2021). Several future studies will investigate the issue of agency in children, looking at when it is appropriate to give them agency and the various concerns surrounding their use of agency. In addition, the role of parents and society in supporting the children's participation through the agency is essential. The social, cultural, policy, and technological parts affect children's participation. Thus, exploring the potential of children and facilitating the transformation of norms positive for adolescent sexual and reproductive health through child agency are needed.

CM in Refugees for the Humanitarian Context

Protracted conflict and refugees have aggravated the cause of CM, which is rooted in culture (Hamad et al., 2021). Bartels et al. (2021) found that CM among Syrian refugees in Lebanon is influenced by immigration status. In addition, gender, culture, religion, poverty, and education factors aggravated this condition. Therefore, future research is recommended to find out how immigration policies and laws contribute to gender, culture, poverty, and education to CM and the effects of such marriage on the children.

Limitations

Despite its comprehensive coverage, this study has inherent limitations typical of bibliometric analyses. It relies solely on the Scopus database, potentially excluding relevant studies from sources like Web of Science and PubMed. The use of specific keywords, "child marriage" OR "child bride*," may overlook related terms like "early marriage" and "forced marriage," suggesting the need for broader keyword inclusion in future research. Additionally, the analysis is limited to articles published up to 2021 and in English, excluding significant non-English research and more recent studies. Future research should expand the database, keywords, and language scope for a more comprehensive review.

Conclusion

The study used bibliometrics and content analysis to describe the development trends of CM research and identify future opportunities for research between 1994 and 2021. The research found that publications about CM have fluctuated but tend to increase. The United States, India, and the United Kingdom dominated journals, authors, and publications that discussed CM, although the issue is widespread in Asian and Middle Eastern nations. These findings can indicate several things: first, the world, especially the Western world, has considerable attention to the problem of CM; second, there are limited resources and research capabilities in Asia and the Middle East; third, the United States, India, and the United Kingdom have superior academic capabilities, financial support, and a high level of international cooperation. The findings underscore the need to improve research capabilities in the most affected areas and assist local researchers in disseminating their findings to address CM issues more efficiently.

Based on the keywords that emerged, it was found that the concept and definition of CM varied in each publication. However, CM was closely related to gender inequality regarding education, reproductive health, and children's rights, leading to the conclusion that empowerment is an effort to overcome CM problems. The thematic analysis of CM publications identifies five key research areas. The first cluster examines the drivers, impacts, and interventions of CM, focusing on how social norms, poverty, and conflict harm girls. The second cluster highlights the challenges of addressing CM in patriarchal and religious societies due to cultural practices. The third cluster addresses the severe health and reproductive consequences of CM, linking early marriage to poor maternal and infant health and emphasizing the need for better education and healthcare. The fourth cluster views CM as a human rights violation connected to domestic violence and gender inequality, advocating for legal reforms and educational empowerment. Lastly, the fifth cluster explores the intergenerational impacts of CM on children's health, stressing the need for health interventions to break this cycle.

The study has several implications. It emphasizes the need for targeted interventions and policy enhancements in regions most affected by CM. Additionally, there is a call for increased support for local researchers to improve the global understanding and response to CM.

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