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Global Trends in Reproductive Health Education Among High School Students: A Systematic Review

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Abstract: This systematic review and bibliometric analysis maps global research trends in reproductive health education (RHE) among high school students from 2015 to 2025. Data from 447 Scopus-indexed publications were analyzed using VOSviewer and Biblioshiny. Findings reveal a steady increase in publications, peaking in 2022, with significant contributions from China, Indonesia, and Ethiopia. Thematic analysis identified four dominant domains: adolescent behavior, school-based education, gender and rights, and policy innovation, indicating a shift from risk prevention toward empowerment-oriented and technology-based education. The study's novelty lies in its decade-long global synthesis, integrating bibliometric and systematic approaches. The findings underscore the need for inclusive, culturally sensitive, and digitally-enhanced curricula to inform evidence-based policymaking aligned with the Sustainable Development Goals (SDGs).

Keywords: Global Research Trends, High School Students, Reproductive Health Education

A. Introduction

Reproductive health education (RHE) is globally recognized as a fundamental strategy for promoting adolescent health, particularly during the critical transition from childhood to adulthood. The World Health Organization (WHO) and UNESCO emphasize the urgency of integrating comprehensive sexuality education (CSE) into formal curricula to equip young people with essential knowledge, attitudes, and life skills for responsible sexual behavior (Chinelli et al., 2024; Rivenes Lafontan et al., 2024). A growing body of evidence shows that well-implemented RHE improves students' awareness of reproductive health issues and reduces risky sexual practices within school settings (Turi, 2020; Worku et al., 2024).

In developing regions, however, persistent challenges remain despite global advocacy. Adolescent pregnancy, sexually transmitted infections (STIs), and unsafe sexual practices continue to be prevalent, indicating that school-based interventions

have not yet achieved their full preventive potential (El Kazdouh et al., 2019; Worku et al., 2024). Studies in Ethiopia and Tanzania, for instance, report that early sexual initiation and unintended pregnancies are often linked to inadequate access to reproductive health information and limited parental communication (Khanal et al., 2023; Uhawenimana et al., 2024). Moreover, research suggests that increased knowledge alone does not consistently translate into behavior change, highlighting the need for more context-sensitive and empowering approaches (Dwyer et al., 2019; Hasan et al., 2025).

Cross-national comparisons further demonstrate uneven progress. While many high-income countries have long institutionalized comprehensive reproductive health curricula, low- and middle-income countries (LMICs) still face social, cultural, and institutional barriers that restrict open classroom discourse about sexuality and reproduction (Khosla & Tzortziou-Brown, 2025). In China, for example, school- and online-based sexuality education has improved students' awareness but has also encountered resistance from parents and school administrators (Liu et al., 2023; A. Yu et al., 2022). Likewise, several African countries, including Rwanda and Tanzania, have expanded school-based reproductive health programs, yet cultural taboos, insufficient teacher training, and limited resources continue to weaken program effectiveness (Muganwa et al., 2025; Nkurunziza et al., 2024; Uhawenimana et al., 2024).

Collectively, these studies confirm that RHE is indispensable for adolescent well-being and global development. The linkage between comprehensive education, reduced adolescent pregnancy, and improved contraceptive use is well documented (Boozalis et al., 2020; de Castro et al., 2018). Yet despite this empirical foundation, several critical gaps persist in the global RHE literature. First, there is a lack of global comparative analysis, most studies remain localized—centered on single countries, specific schools, or small populations—so cross-regional patterns and shared challenges are not adequately captured (Kassahun et al., 2019; Worku et al., 2024). Second, few studies have systematically synthesized global trends over time, while many empirical findings exist, limited work has mapped publication growth, thematic shifts, or emerging priorities in RHE across the last decade (Khosla & Tzortziou-Brown, 2025). Third, the linkage between research productivity and policy adoption is underexplored, although national and international agencies have provided reproductive health frameworks, how academic evidence translates into curriculum implementation remains unclear (Brunelli et al., 2022; Koren & Marchburn, 2022; Zamponi et al., 2024). Finally, no consolidated bibliometric review has identified the leading contributors and intellectual structure of the field, without a comprehensive mapping of authors, countries, institutions, and collaboration networks, the evolution and direction of RHE scholarship remain difficult to interpret at a global scale.

Recent years have also brought new directions to RHE research, including digital

learning platforms, peer education, and rights-based approaches. These innovations appear especially relevant in contexts where conventional classroom instruction faces cultural resistance or limited resources (Liu et al., 2023; A. Yu et al., 2022). At the same time, UNESCO's updated Technical Guidance on Sexuality Education and the WHO Health Promoting Schools framework have encouraged countries to adopt evidence-based, age-appropriate RHE models (Choi et al., 2020; Shinde et al., 2018). Even so, implementation remains uneven in LMICs, where programs often improve knowledge but lack sustainability and measurable long-term behavioral impact (Khanal et al., 2023; Turi, 2020). This divergence between growing global guidance and variable real-world uptake highlights the need to understand how research in this field is expanding and shifting across countries and themes.

To address these gaps, bibliometric analysis is particularly well suited because it enables an objective, large-scale examination of scientific production. Unlike narrative summaries or single-country reviews, bibliometrics can: (1) quantify global research productivity and growth patterns over time**;** (2) identify leading authors, institutions, journals, and countries driving the field; (3) map collaboration networks that reveal how knowledge is exchanged across regions; and (4) visualize conceptual structures and thematic clusters through keyword co-occurrence and thematic evolution. When combined with a systematic literature review (SLR), bibliometrics provides both the macro-level landscape and the interpretive depth needed to explain shifts in focus, disparities in contribution, and emerging research frontiers in RHE.

Therefore, this study offers a novel integrative approach by combining systematic literature review and bibliometric analysis to examine global trends in reproductive health education among high school students between 2015 and 2025. Beyond summarizing interventions or outcomes in specific settings, this review maps global scholarly output, identifies prolific contributors and institutions, and tracks thematic evolution over a full decade—capturing shifts toward gender inclusivity, digital pedagogy, and empowerment-oriented education. Such evidence is crucial not only for researchers seeking to advance the field, but also for policymakers and educators aiming to design culturally responsive, evidence-based RHE programs aligned with global best practices and the Sustainable Development Goals (SDGs).

Building on the foundations above, this study addresses the following research questions:

1. How has the global research output on reproductive health education among high school students evolved from 2015 to 2025?
2. Which journals or source titles have contributed most significantly to the publication of reproductive health education research during this period?
3. Who are the most influential authors, and what collaboration patterns can be observed in this field?
4. Which countries and institutions have produced the highest number of

publications on reproductive health education between 2015 and 2025?
5. What are the most prominent keywords and thematic clusters characterizing reproductive health education research?
6. What does the overall research landscape reveal about the direction, focus, and gaps in the field from 2015 to 2025?

B. Methods

This study employed a bibliometric mapping approach integrated with a systematic review framework to analyze global research trends in *reproductive health education among high school students* published between 2015 and 2024. The bibliometric approach enables researchers to quantify and visualize patterns in scientific production, collaboration, and thematic evolution, thereby offering insights into how scholarly discourse in this domain has developed globally over time (Nurazmi et al., 2025; Nurfadilah et al., 2025). Through this method, the study identifies research output dynamics, key contributors, institutional affiliations, and thematic clusters within the broader field of adolescent reproductive health.

The methodological framework follows the general structure of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines to ensure transparency, reproducibility, and accuracy (Mukamana, 2016). This framework integrates quantitative bibliometric indicators with qualitative interpretation of research trends. The methodological process consisted of five main stages: (1) data source identification, (2) search and retrieval strategy, (3) application of inclusion and exclusion criteria, (4) data extraction and analysis, and (5) visualization and interpretation of bibliometric networks.

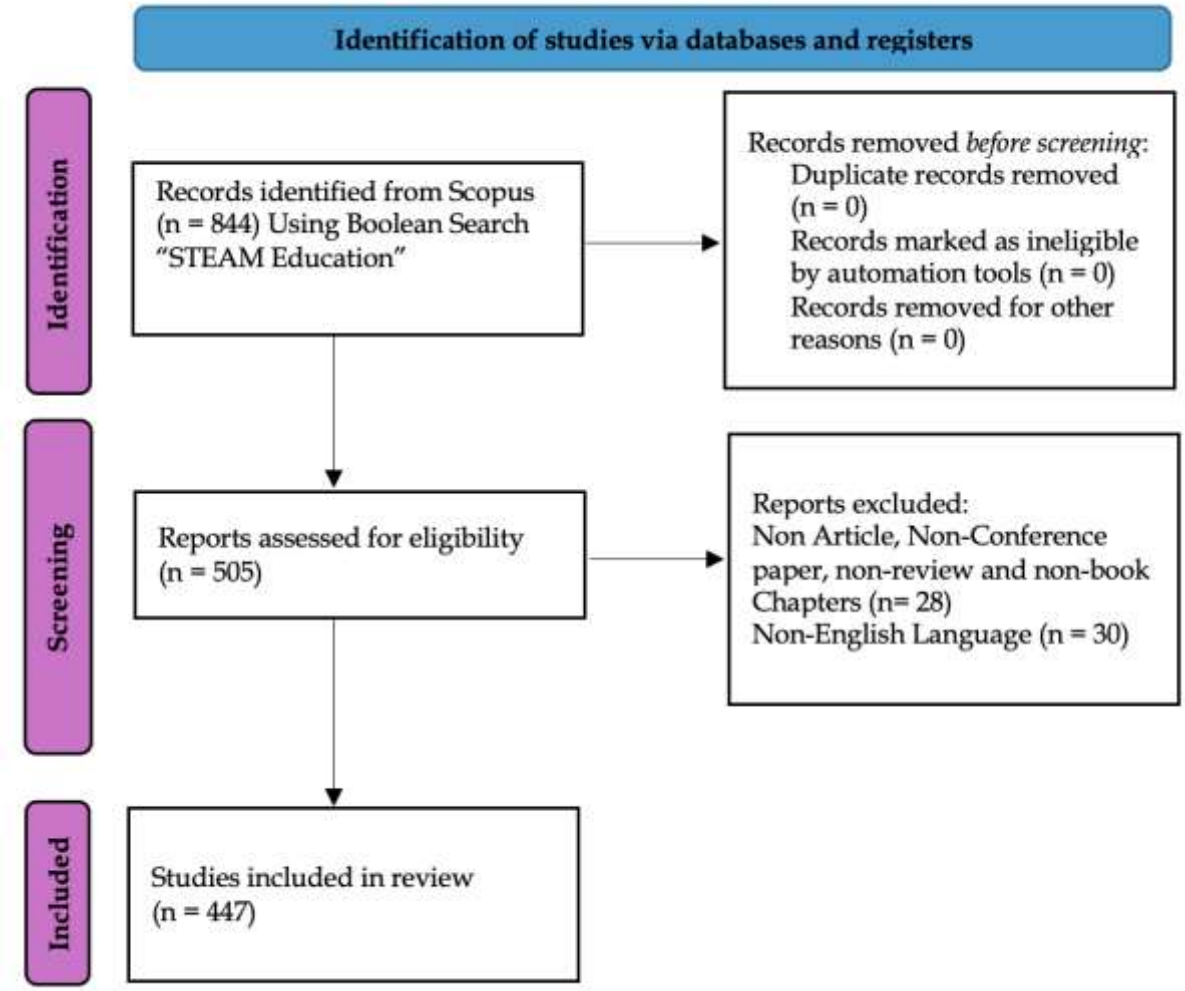

Figure 1 The PRISMA flow diagram detailing the screening and selection process of literature

Bibliographic data were retrieved exclusively from the Scopus database (https://www.scopus.com) on October 21, 2025. Scopus was chosen for its extensive peer-reviewed coverage and reliable citation tracking (Khosla & Tzortziou-Brown, 2025; Nurazmi et al., 2025; Nurfadilah et al., 2025). The search was performed using the TITLE-ABS-KEY field with the query:
TITLE-ABS-KEY ("reproductive health" AND "high school student")

The search initially identified 844 documents, which were subsequently screened and refined to ensure relevance to reproductive health education, adolescent sexual behavior, and school-based health promotion (Worku et al., 2024).

To ensure data accuracy and relevance, three inclusion and exclusion filters were systematically applied to the initial 844 documents retrieved from Scopus. First, publications were limited to the 2015–2025. Second, document type only journal articles and conference papers. Third, the search was restricted to English-language

publications, which yielded a final dataset of 447 documents. The selection process adhered to the PRISMA framework shown in figure 1, proceeding through four stages: Identification (n = 844), Screening (n = 505), Eligibility (n = 477), and Inclusion (n = 447). The final metadata were downloaded in both CSV and RIS formats for analysis. Descriptive statistical analysis, including publication growth and citation trends, was conducted using Microsoft Excel, while VOSviewer was employed to visualize co-authorship, co-citation, and keyword co-occurrence networks (Leles et al., 2024; D. Yu, 2020). Advanced bibliometric mapping was carried out using Biblioshiny, an R-based *Bibliometrix* interface, which facilitated analyses of author productivity (Lotka's Law), journal impact (Bradford's Law), and thematic evolution.

This study used secondary, publicly accessible data; thus, no ethical clearance was required. All analyses adhered to Elsevier's data-use policies and principles of research integrity. Limitations include reliance on a single database (Scopus), English-language bias, and limited qualitative insight into policy or contextual factors (Khosla & Tzortziou-Brown, 2025). Despite these limitations, the combined use of Excel, VOSviewer, and Biblioshiny ensured robust triangulation, providing a comprehensive overview of the global research landscape in reproductive health education for high school students.

C. Results and Discussion

1. Result

1.1 Research Output Trends

The bibliometric data (Figure 1) demonstrate a significant upward trend in publications related to reproductive health education among high school students between 2015 and 2025. The output rose from 24 documents in 2015 to a peak of 66 documents in 2022, before slightly declining to 42 in 2025. The gradual increase between 2015 and 2019 (rising from 24 to 50 documents) reflects the early adoption of the Sustainable Development Goals (SDGs) and global prioritization of adolescent health education.

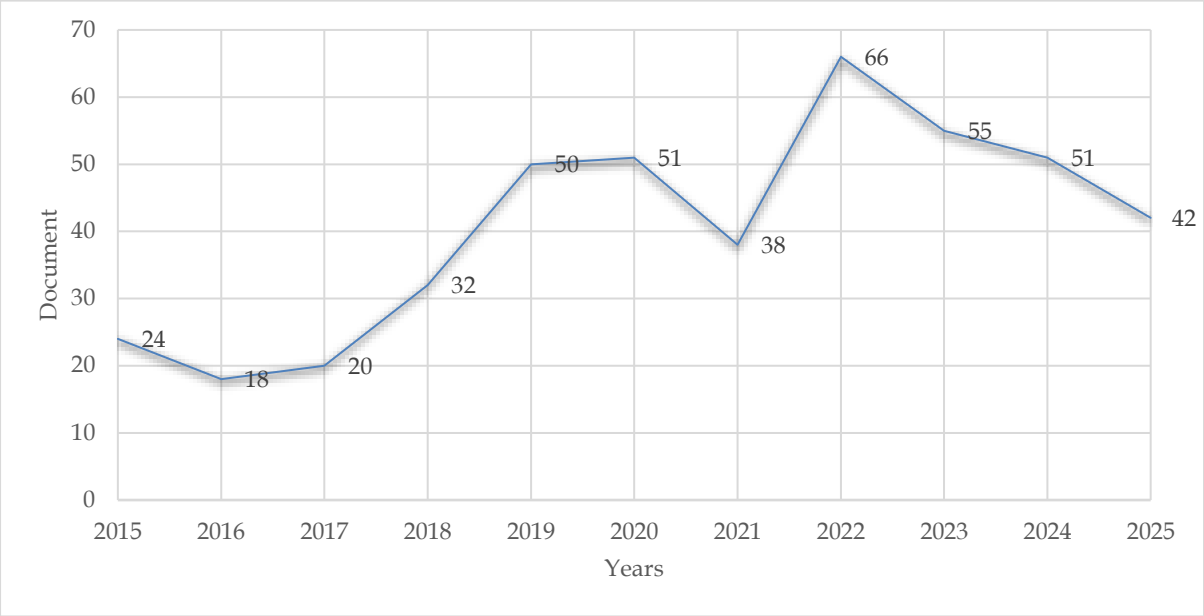

Figure 2 Annual Scientific Production

The temporary dip observed in 2021 (38 documents) corresponds to the global research disruption caused by the COVID-19 pandemic, which affected fieldwork and school-based data collection. However, research productivity rebounded sharply in 2022, as many studies shifted toward digital learning platforms, virtual peer education, and online sexuality programs (Lyu, 2020; Yu, 2012). The continued high publication output from 2022 to 2024 (ranging from 51 to 55 documents) indicates sustained scholarly attention on reproductive health, demonstrating resilience and adaptability within the research community. Overall, this trend confirms that reproductive health education has become a consistent global research priority, reflecting the increasing integration of education and health policy frameworks in addressing adolescent well-being (Langford, 2015; Mukamana, 2016).

1.2 Geographical and Institutional Contributions (RQ3–RQ4)

The Sankey diagram (Figure 2) illustrates the interconnectedness among countries, institutions, and thematic keywords, revealing the global research network structure. The most productive countries are China, Indonesia, Rwanda, Nigeria, Ghana, Ethiopia, South Africa, and the United Kingdom, indicating a balanced mix of contributions from both developed and developing regions. China and Indonesia emerge as major contributors in Asia, often focusing on topics such as *sexual education*, *digital health literacy*, and *school-based interventions*. Rwanda, Ethiopia, and Nigeria represent strong African research clusters emphasizing *adolescent reproductive health*, *gender equality*, and *HIV prevention* (Worku et al., 2024; Uhawenimana, 2024). The United Kingdom serves as a central hub for collaborative projects, linking African and Asian partners through multi-institutional research funding (Khosla & Tzortziou-Brown, 2025). Institutionally, the University of Rwanda, Debre Tabor University

(Ethiopia), University of Nigeria, and Universitas Padjadjaran (Indonesia) are identified as leading contributors. Their focus areas ranging from *menstrual hygiene management* to *youth reproductive education* reflect both local priorities and regional health policy frameworks. The clustering patterns in the Sankey diagram suggest that African institutions tend to collaborate regionally, while Asian universities increasingly connect to global research networks through technology-based initiatives.

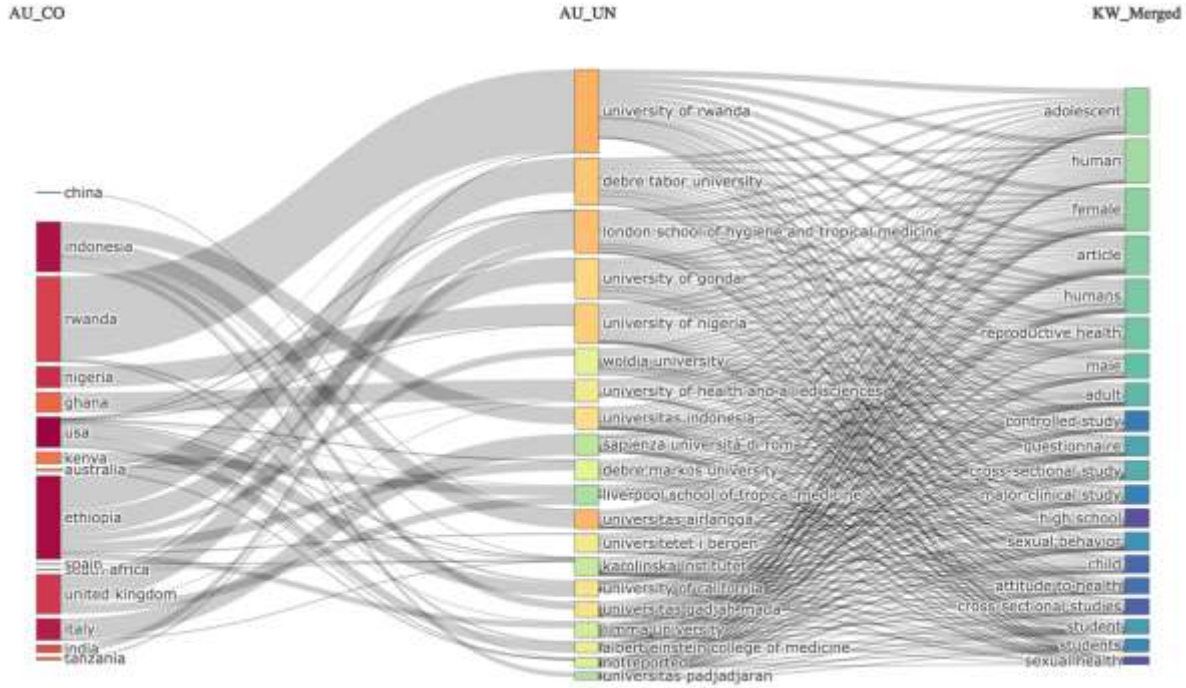

Figure 3 Three-field Plot Affiliation, Country and Keywords

1.3 Most Influential Authors and Publication Sources

a. Most Productive and Influential Authors

Table 1 Most Productive Authors in Reproductive Health Education

No	Author	Institution	Document	Cititation	Total Link Strengh
1	Tangera, Olive	University of Rwanda	5	18	12
2	Deveaux, L.	Ministry of Health and Wellness, Bahamas	4	64	16
3	Wang, Bo	Universitas of Massachusetts Chan Medical School, United States	4	64	16
4	Melani, Niken	Poltekes Kemenkes Yokyakarta, Indonesia	4	15	0
5	Siswantara, Pulung	Universitas Airlangga, Indonesia	4	11	3
6	Lunn, Sonja	Bahamas Ministry of	3	60	14

7	Rolle, Glenda	Health Bahamas Ministry of Health	3	60	14
8	Statone, Bonita	Hackensack Meridian School of Medicinein, United States	3	60	14
9	Adderley, Richard	Bahamas Ministry of Health	3	58	12
10	Gianfrilli, Daniele	Sapienza Università di Roma, Italy	3	46	0

The upper panel of Table 1 lists the leading authors ranked by the number of published documents, total citations, and network link strength. The analysis shows that Tengera Olive, and Deveaux Hyette are among the most prolific contributors, each producing four to five publications between 2015 and 2024. Their research primarily focuses on adolescent sexual behavior, contraceptive use, and school-based reproductive health programs in sub-Saharan Africa. Other prominent authors include Wang Bo, Meliani Niken, and Siswantara Pulung, who contribute significantly to studies on health education models and technology-based learning interventions in Asian contexts. The network link strength data indicate increasing cross-regional collaboration, with researchers from Africa, Asia, and Europe co-authoring multi-institutional papers.

b. Most Relevant Journals and Sources

The lower panel of Figure 3 presents the most relevant publication sources, measured by the number of documents indexed in Scopus. The top three outlets are *Reproductive Health*, *BMC Public Health*, and *PLOS ONE*, each contributing between 15 and 20 papers to the field. These journals emphasize open-access dissemination and global health equity, which explains their dominance in adolescent and reproductive health research. Other influential journals include the *Journal of Adolescent Health*, *Sex Education*, and the *International Journal of Environmental Research and Public Health*, which collectively represent interdisciplinary intersections between education, gender, and health policy. Notably, the *BMC Public Health* and *Reproductive Health* journals show a consistent increase in publications after 2019, reflecting the surge of empirical and intervention-based studies conducted in Africa and Southeast Asia.

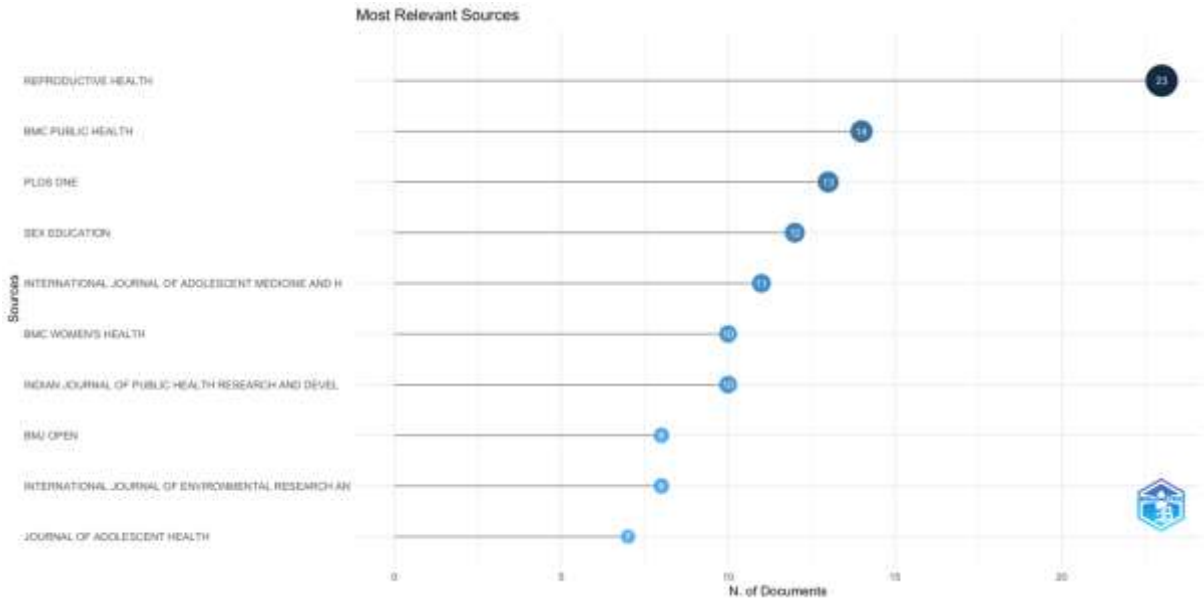

Figure 4 Most Relevant Sources

This bibliometric evidence reinforces that high-impact, open-access journals serve as the primary dissemination platforms for reproductive health education research. Their broad international readership has facilitated knowledge exchange between developed and developing regions, thereby supporting policy formulation and evidence-based health education practices worldwide.

1.3 Keyword and Thematic Associations

a. Network Visualization of Keywords

The keyword co-occurrence network (Figure 5) shows the conceptual structure of 447 analyzed documents, with "adolescent," "human," "student," "female," "reproductive health," "sexual behavior," and "education" as dominant nodes. Six main thematic clusters were identified; Red (cluster 1), Green (cluster 2), Blue (cluster 3), Yellow (cluster 4), Purple (cluster 5), Light Blue (cluster 6). These clusters confirm the interdisciplinary nature of reproductive health education research, emphasizing the school environment as a vital platform for adolescent health literacy.

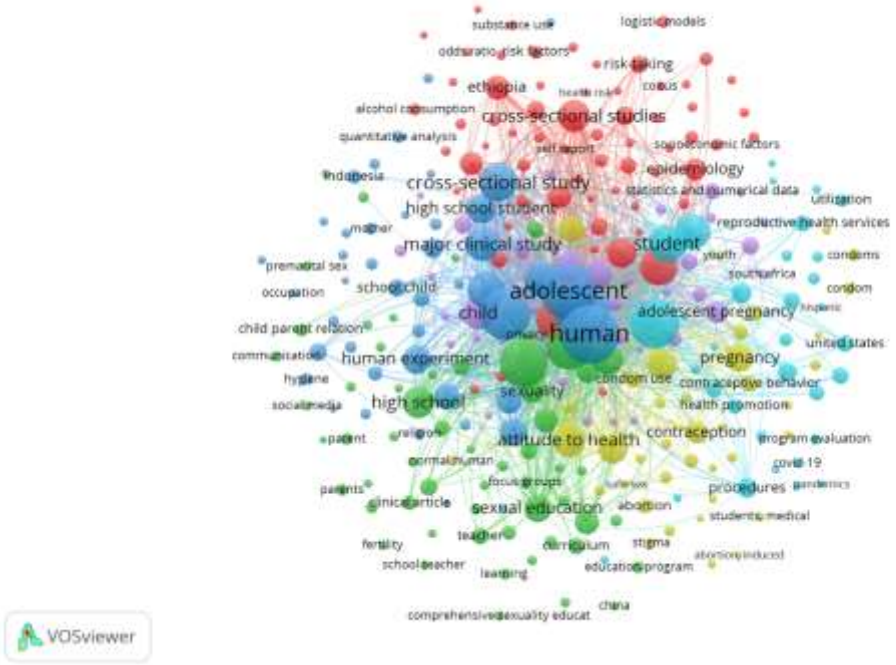

Figure 5 Network Visualization of Keywords on Reproductive Health Education

b. Tree Map of Thematic Distribution

The tree map (figure 6) illustrates keyword frequency, where "human" (346), "adolescent" (244), "female" (220), and "reproductive health" (165) dominate. Emerging subthemes include *menstrual hygiene, contraceptive use, school-based learning,* and *psychology of sexual behavior.*

After 2020, terms like *"digital education," "peer learning,"* and *"knowledge dissemination"* gained prominence, reflecting the shift toward technology-enhanced reproductive health learning, particularly in response to the COVID-19 pandemic. This indicates the field's evolution from traditional health education to adaptive, digitally supported learning frameworks.

Figure 6 Tree Map of Thematic Distribution

c. Trend Topics and Emerging Research Directions

Temporal analysis (Figure 7) shows a chronological evolution of research themes in 2015–2017 Focused on *HIV prevention, pregnancy,* and *contraception*—risk-oriented studies. 2018–2020 Transitioned to *gender equality, youth empowerment,* and *school health education*. 2021–2025 Introduced *digital health, peer education, mental health,* and *online learning*. These trends reveal a shift toward innovation, integration, and inclusivity, with digital pedagogy and psychosocial empowerment becoming central themes.

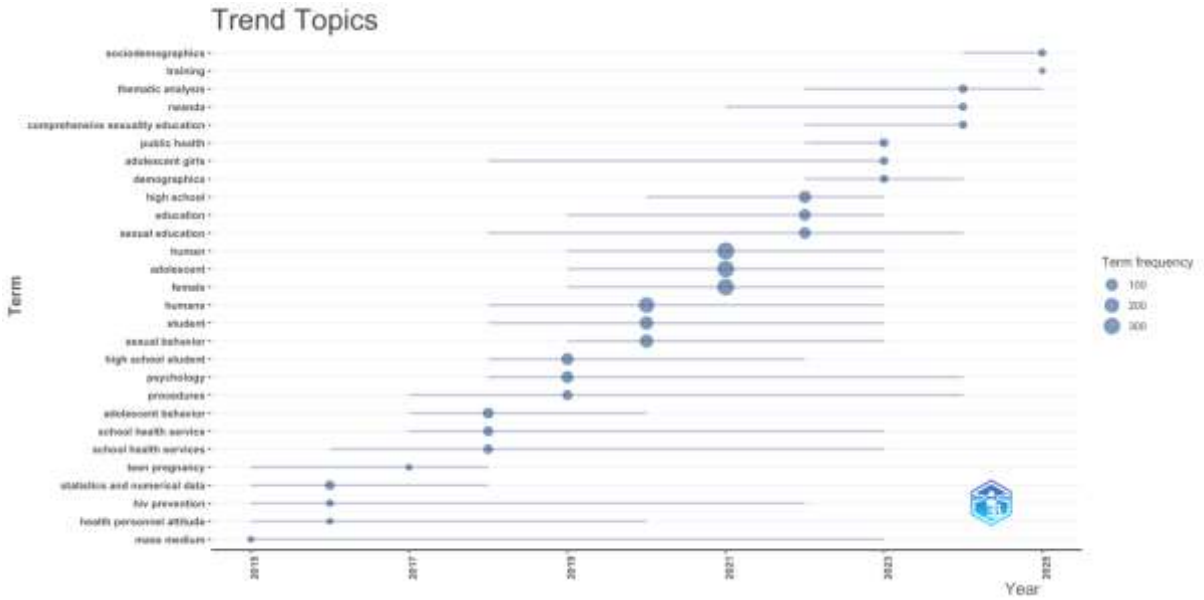

Figure 7 Trend Topics

d. Thematic Map and Evolution

The thematic map (Figure 8) shows how major themes are positioned based on their importance (centrality) and level of development (density). Four categories are identified: motor themes, basic themes, niche themes, and emerging or declining themes. The motor themes *human*, *adolescent*, and *female* represent the core focus of global research, highlighting adolescent reproductive health and gender-sensitive education. Basic themes such as *student* and *cross-sectional study* serve as the methodological foundation for most school-based studies, while niche themes such as *teacher competency* and *curriculum design* are emerging in the context of educational innovation. Meanwhile, declining themes like *pregnancy* and *fertility control* indicate a shift away from problem-oriented approaches toward empowerment-based education. Overall, the map reflects a transition from medical-prevention perspectives to multidisciplinary and rights-based approaches that connect health, education, and gender equity. The thematic evolution map (Figure 9) further illustrates this transformation over time. Between 2015 and 2019, research focused on *HIV prevention*, *contraception*, and *health attitudes*, reflecting risk-based interventions. From 2020 to 2021, studies increasingly explored *adolescent health* and *menstrual hygiene*, while 2022 to 2023 saw the rise of topics like *digital learning*, *sexual behavior*, and *education*, influenced by global digitalization and the COVID-19 pandemic. By 2024–2025, research had matured around *health literacy*, *teacher involvement*, and *policy-driven education*, signaling integration between the education and health sectors. Collectively, these findings reveal that reproductive health education has evolved into a globally mature and context-sensitive discipline, characterized by a shift from risk prevention to empowerment, inclusivity, and technological innovation.

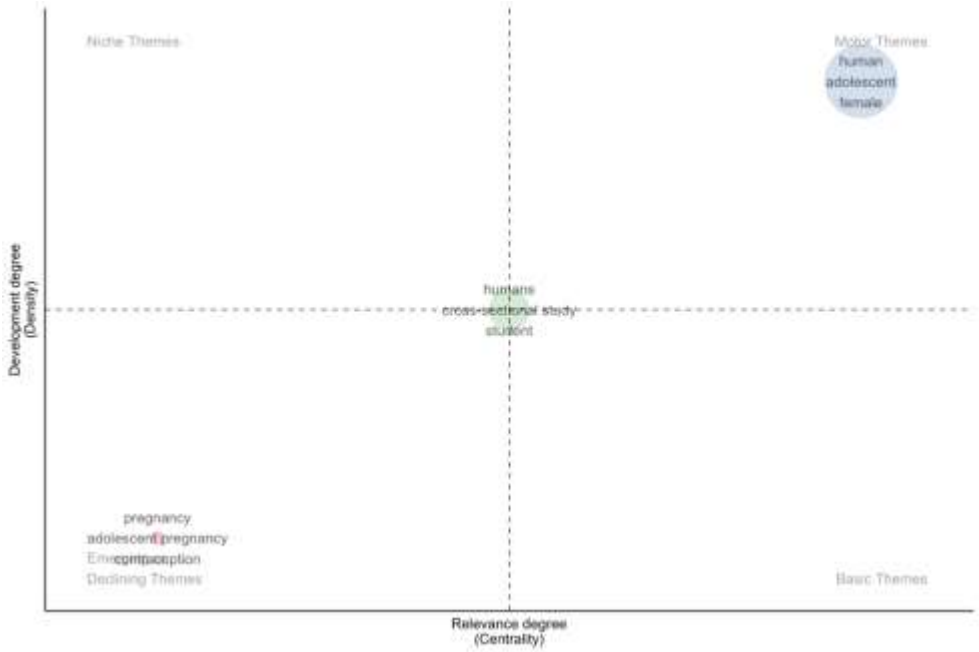

Figure 8 Thematic Map on Reproductive Health Education Research

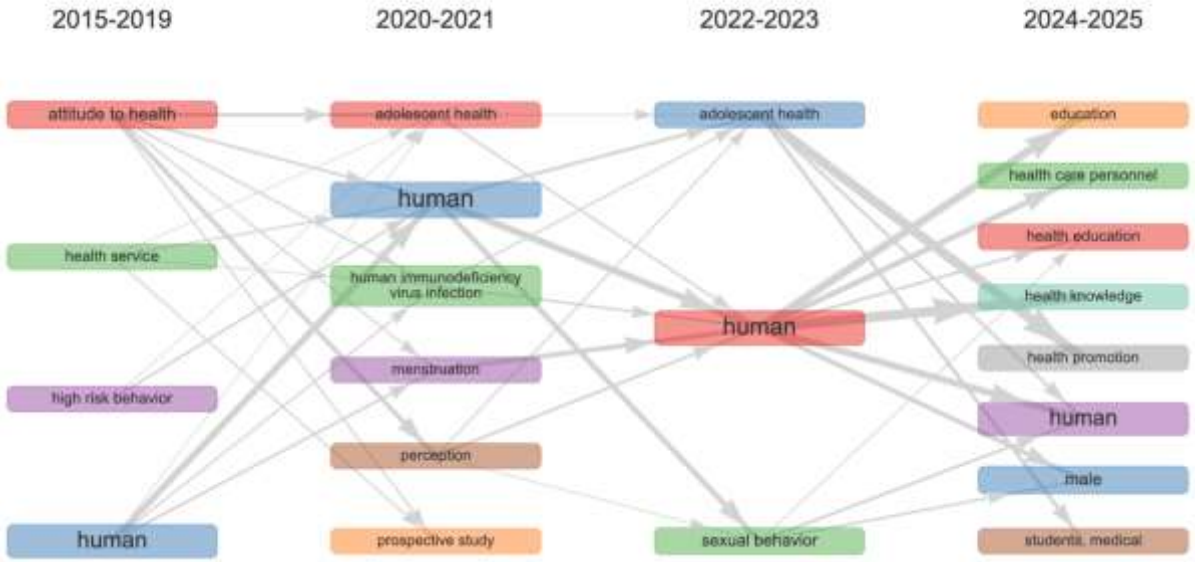

Figure 9 Thematic Evolution on Reproductive Health Education Research

2. Discussion

The present study provides a comprehensive bibliometric and systematic overview of global research trends on reproductive health education (RHE) among high school students from 2015 to 2025. By integrating bibliometric mapping with a systematic review approach, this work offers a multi-layered understanding of publication patterns, thematic evolution, and collaboration dynamics across regions. Overall, the

findings confirm that RHE has become a central scholarly and policy concern in advancing adolescent well-being and supporting Sustainable Development Goals (SDGs) related to health, gender equality, and quality education (Costin et al., 2024; Karayel et al., 2023; Kennedy & Cherry, 2023).

Global output trends, the analysis shows a consistent upward trajectory in publications from 2015 to 2024, indicating a sustained rise in academic attention to adolescent reproductive health. The peak in 2022 suggests a post-pandemic acceleration of research, likely linked to broader educational adaptations toward online and hybrid learning as well as renewed policy urgency around adolescent health after COVID-19 (Liu et al., 2023; A. Yu et al., 2022). This pattern underscores that RHE is no longer a peripheral topic but a stable global research agenda.

Most contributing journals/source titles**,** the distribution of publications across high-impact and open-access venues (e.g., Reproductive Health, BMC Public Health) signals that the field values broad accessibility and cross-disciplinary reach. This is important because open dissemination enables policymakers and educators—especially in LMICs—to access evidence and adapt it into national curricula or school-based programs. The prominence of these journals also reflects RHE's intersection across public health, education, and gender studies.

Influential authors and collaboration patterns, co-authorship networks indicate that international collaboration has expanded over the decade but remains regionally clustered. The emergence of active contributors from African and Asian institutions (e.g., University of Rwanda, Debre Tabor University, Universitas Padjadjaran, Universitas Airlangga) shows that scholarly leadership is diversifying beyond traditional Western centers. However, partnerships still tend to be bilateral and project-driven, suggesting that collaboration is often motivated by donor-supported initiatives rather than sustained multilateral knowledge exchange. Strengthening long-term consortia that connect educators, health researchers, and policy actors could improve data comparability and accelerate translation into practice (Khosla & Tzortziou-Brown, 2025).

Leading countries and institutions, the most productive countries China, Indonesia, Ethiopia, and Rwanda demonstrate rising engagement from developing regions, aligning with urgent local needs around adolescent pregnancy and STI prevention (Khanal et al., 2023; Worku et al., 2024). Nevertheless, high-income countries (notably the United States and United Kingdom) continue to dominate high-impact outputs, revealing persistent inequities in global knowledge production. This imbalance highlights the importance of supporting South–South and North–South collaboration, capacity building, and equitable research funding mechanisms.

Prominent keywords and thematic clusters, keyword co-occurrence and thematic

mapping show a clear conceptual shift. Early work (2015–2018) concentrated on risk mitigation (HIV prevention, contraception, adolescent pregnancy). Over time, the field expanded toward gender equality, empowerment, and rights-based approaches, with post-2020 studies increasingly integrating terms such as digital learning, peer education, and mental health. The thematic map identified adolescent behavior, school-based education, gender and rights, and policy engagement as four stable research domains. The persistence of "adolescent," "human," and "female" as motor themes indicates enduring global concern for youth reproductive agency, while teacher competency and curriculum design emerging as niche themes underscore the growing recognition of implementation quality (Eisenberg et al., 2022; Richards et al., 2021).

Overall landscape, direction, and gaps, thematic evolution trends suggest intellectual maturation from preventive, knowledge-transfer models toward holistic frameworks linking empowerment, education systems, and digital inclusion. This aligns with UNESCO's updated Technical Guidance and WHO's Health Promoting Schools framework, which position RHE as cross-sectoral and rights-based rather than purely biomedical.

One of the most significant developments is the rise of digital and peer-based learning models, accelerated during and after the COVID-19 pandemic. Digital platforms—including mobile applications, social media interventions, and virtual peer networks—have shown promise in improving awareness and reducing stigma in Asia and Africa (Liu et al., 2023; Zhou et al., 2022). However, beyond acknowledging their importance, the trend signals concrete implementation needs. The rise of digital pedagogy necessitates investment in teacher training for digital literacy, the development of safeguarding and privacy protocols for adolescent online learning, and the co-creation of engaging, interactive RHE content with adolescents themselves. Co-designing modules with students can increase cultural relevance, reduce resistance, and ensure that digital materials reflect real adolescent questions and experiences. At the same time, policymakers should address unequal access to devices and internet infrastructure in low-resource settings, because digital RHE can widen disparities if access gaps remain (Khanal et al., 2023; Mihretie et al., 2023). Future studies should examine how teacher and student digital literacy mediates learning outcomes and how hybrid online–offline models can be scaled sustainably.

The study also carries practical implications. First, the concentration of global evidence in accessible journals provides a strong basis for policy alignment with international standards. Second, the shift toward empowerment-oriented education reinforces the importance of culturally responsive curricula integrating gender equality, human rights, and psychosocial well-being. Third, identifying key authors, institutions, and countries offers a roadmap for future partnerships and mentorship to reduce capacity gaps in LMICs. Finally, long-term sustainability of RHE requires

teacher training, community engagement, and digital innovation working in tandem, rather than isolated interventions.

Several limitations should be noted. Reliance on Scopus and English-language publications may exclude relevant regional research, especially from LMICs. Bibliometric indicators also capture trends and citation impact but cannot fully reflect contextual nuances of implementation. Future research should broaden database coverage, include non-English literature, and adopt rigorous comparative and longitudinal evaluations of program effectiveness. In addition to digital learning, emerging intersections with social media influence, gender-based violence prevention, and climate-related vulnerabilities may offer valuable new interdisciplinary directions.

Overall, this study confirms that RHE research has evolved into a mature, inclusive, and technologically adaptive field. The global trajectory reflects not only rising productivity but a transformation in priorities from risk avoidance to empowerment, from isolated interventions to systemic integration, and from conventional instruction to digital engagement. By explicitly mapping these shifts and identifying where inequities persist, the study strengthens the evidence base needed to advance adolescent reproductive rights, health literacy, and gender equality worldwide in the post-2025 era.

D. Conclusions

This study aimed to map global research trends in reproductive health education (RHE) among high school students through a systematic review and bibliometric analysis of 447 Scopus-indexed publications (2015–2025). Overall, the most critical finding is a clear and sustained rise in RHE scholarship, accompanied by a thematic shift from health-risk prevention (e.g., HIV, contraception, adolescent pregnancy) toward empowerment-based, rights-oriented, and technology-integrated education. Influential contributions emerge from both high- and middle-income countries, with Asia and Africa showing especially notable growth in output and international collaboration. Thematic analysis consistently clustered the literature into four core domains adolescent behavior, school-based education, gender and rights, and policy engagement underscoring RHE as an interdisciplinary field linking education, public health, and social justice. Practically, these results reinforce the urgent need for inclusive, culturally sensitive, and digital-friendly RHE curricula within secondary school systems. Strengthening teacher training, engaging families and community stakeholders, and building cross-sector partnerships are pivotal to ensure equitable and sustainable implementation. Despite substantial progress, important gaps remain, particularly in understanding long-term behavioral outcomes and the effectiveness of digital delivery formats across contexts. Future research should therefore focus on: (1) evaluating the long-term efficacy of digital peer-to-peer and

school-based RHE models; (2) exploring the role of artificial intelligence and adaptive platforms in personalizing RHE learning for diverse adolescent needs; and (3) investigating how socio-cultural and religious factors shape curriculum acceptance, teacher practices, and student engagement in different regions. In sum, global RHE research is advancing into a more mature, evidence-driven domain that can meaningfully accelerate adolescent well-being, gender equality, and progress toward the Sustainable Development Goals worldwide.

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