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The Rise of Digital Health: A Bibliometric Review of Social Media and Online Platforms for STI Education in Adolescents

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ABSTRACT

Purpose of the study: Sexually Transmitted Infections (STIs) continue to increase, especially among adolescents. Minimal sexual education and risky behaviors are the main factors in STIs. In the digital era, social media has the potential to be an effective means of STI education for adolescents. However, scientific studies related to this matter are still limited. This study aims to map the current research landscape regarding the use of social media and online platforms for STI education among adolescents.

Materials and methods: This study uses a bibliometric approach. Literature searches were conducted in the Scopus database using keywords such as "social media", "online platforms", "IMS/IST education", "adolescents", and "health" for period 2014-2024.

Results: An analysis of 428 documents that met the inclusion criteria showed a very rapid increase in publications related to this topic, with an annual growth rate of 78.5%. The results of the network visualization identified four main clusters, namely: (1) the effectiveness of digital health campaigns; (2) the role of social media platforms such as Instagram, TikTok, and YouTube in the dissemination of information; (3) factors that affect the behavior of receiving health information online; and (4) the development of mobile app-based health interventions (mHealth).

Conclusions: Digital health for adolescent STI education is growing rapidly and multidimensional. The initial surge in publications reflects a response to the global crisis, followed by a deepening of approaches and topics. Bibliometric visualization emphasizes the importance of interdisciplinary and innovative approaches in dealing with adolescent health challenges in the digital age.

Keywords

bibliometrika; social media; online platform; sti education; adolescent health; digital health.

INTRODUCTION

Sexually Transmitted Infections (STIs) are one of the health problems that are currently attracting a lot of attention because the incidence rate of STIs tends to continue to increase (Riddell et al., 2024). Nearly 50% of Americans who contract STIs are under the age of 25 (Betan & Pannyiwi, 2020). The percentage of 15-24 years old is more than 25% of the population contributing to STI cases throughout Indonesia (Rahmah et al., 2025). The development of STIs in Indonesia is also currently very high, where in the last report in 2021, the total number of STI cases from the enforcement of diagnosis results from the diagnosis of the syndrome examination amounted to 7,364 cases, while based on examinations there were 11,133 cases. Laboratory STI cases based on laboratory examinations reported, namely early syphilis 2,976 cases, advanced syphilis 892 cases, gonorrhea 1,482 cases, gonorrhea urethritis 1,004 cases, non-GO urethritis 1,250 cases, servicis proctitis 3,031 cases, venereal lymphogranuloma (LGV) 13 cases, trichomoniasis 342 cases, and genital herpes 143 cases. Meanwhile, the cumulative number of human immunodeficiency virus (HIV) cases reported until March 2021 was 427,201 cases. The five provinces with the highest number of discoveries are DKI Jakarta (71,473), followed by East Java (65,274), West Java (46,996), Central Java (39,978), and Papua (39,419), while Lampung Province has 4,291 cases (Zahro et al., 2024).

STIs are infections transmitted through sexual intercourse, either through vaginal, mouth, or anal caused mainly by bacteria, viruses, or protozoa and are the main disease causing morbidity and mortality worldwide (Simbolon & Budiarti, 2020). Some of the risk factors for the spread of STIs include risky sexual behavior, unprotected sexual intercourse with alternating partners, the use of narcotics, the use of joint syringes in narcotics users are also the transmission channels of some STIs, especially HIV, lack of Sexual Education, and lack of knowledge about how STIs are transmitted and prevented increases susceptibility to infection (Riddell et al., 2024).

It is important to understand that although sexually transmitted diseases have the potential to have serious impacts, most sexually transmitted diseases are actually preventable and treatable (Safitri, 2021). To prevent adolescents from engaging in risky behaviors of STIs and HIV/AIDS, adequate knowledge and from accountable sources are needed (Hidayah et al., 2025). Health education is one of the main strategies in STI prevention, with a focus on increasing knowledge about the risk of STDs, how it is transmitted, and the importance of safe sexual behavior (Arismawati et al., 2022).

In the increasingly advanced digital age, around 90% of teenagers around the world actively use social media on a daily basis. This shows how important social media is in their lives. Through platforms such as Instagram, Snapchat, twitter, facebook, youtube and TikTok, adolescents can connect with their friends, upload content, and even participate (Hidayah et al., 2025), as well as share information including reproductive health information, among adolescents (Lede et al., 2024). Through online health education, information on healthy lifestyles, disease prevention, management of medical conditions, and remote health services can be accessed more easily and quickly by individuals in different parts of the world (Hasyim, 2024). Therefore, health promotion in adolescents must take into account the influence of social media in shaping their behavior and perception of health (Hasyim, 2024). Utilizing social media can be an effective tool to promote adolescent health, such as encouraging healthy behaviors, changing lifestyles and increasing health knowledge related to STIs. However, few studies have addressed STIs. Therefore, this bibliometric study aims to provide a comprehensive overview of global research related to the use of social media and online platforms as a means of education about sexually transmitted infections (STIs) among adolescents.

MATERIALS AND METHODS

The method used in this study is a literature study with a bibliometric analysis approach which examines scientific trends and research dynamics related to adolescent sexual health in the context of digital platforms. Data is extracted by utilizing scopus-based data sources. The scopus data was chosen as the primary data source because it has a wide scope of its peer-reviewed literature across various disciplines. Bibliometric analysis is an approach to examine the evolution of research domains, including topics and authors, based on the social, intellectual, and conceptual structure of a particular discipline. The bibliometric analysis research in this study is focused on IMS Education.

This study uses articles in the publication period from 2019 - 2024, publications in English, types of publications categorized as "articles", and have open access. Data collection used the keywords "social media", "online platforms", "STI/STI Education", "adolescents", and "Health promotion". Bibliometric analysis was carried out using the VOSViewer application/software. VosViewer is a widely used bibliometric analysis tool that allows visualization of bibliographic networks, co-authorship networks, and co-citation networks (Iskandar, 2023).

RESULTS AND DISCUSSION

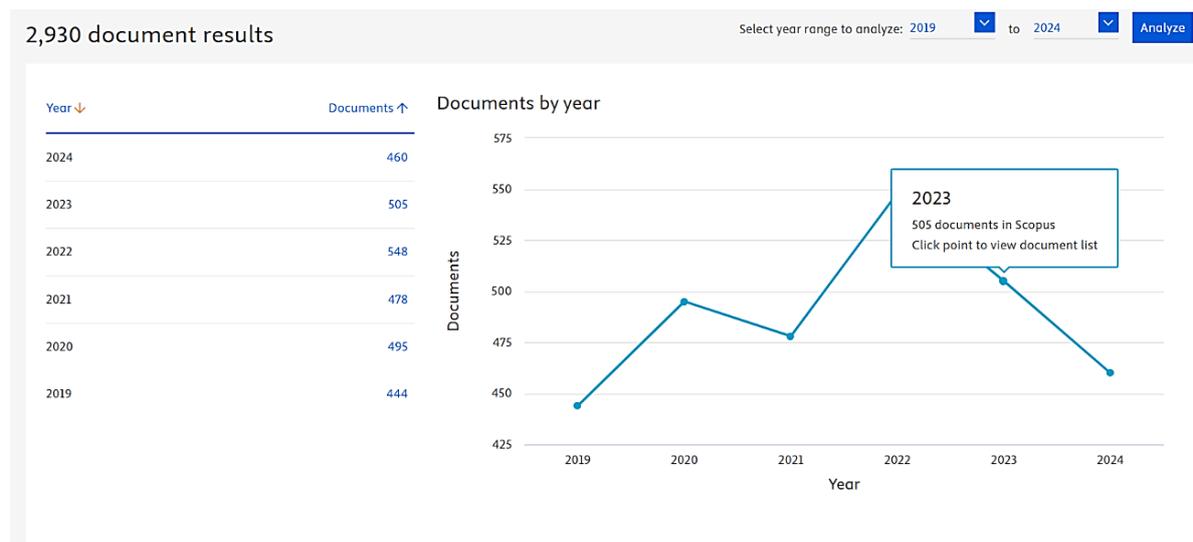


Figure 1. Publication Trends from 2019 to 2024

Based on data from the document search results from Scopus, there are fluctuations in the number of publications related to digital health, especially in the context of sexually transmitted infections (STIs) education in adolescents through social media and online platforms. The year 2020 showed a surge in the number of publications to 495 documents, a significant increase compared to the previous year (2019: 444 documents). This increase reflects the increasing attention of researchers to the use of digital technology in the promotion of adolescent reproductive health, especially in the midst of a pandemic situation that encourages the massive use of online media. Then in 2021 there was a decrease to 478 documents, which could be due to the transition of technological adaptation or a change in research focus after the initial surge. In 2022, there was another increase to 548 documents, becoming the year with the highest number of publications in this period. This shows that interest in digital interventions in STI education is maturing and growing. In 2023 and 2024, it shows a successive downward trend, to 505 documents and 460 documents, respectively. This decline can be interpreted as a stabilization phase or a shift in research focus to a more specific or innovative approach. Overall, the publication trend from 2019 to 2024 shows that the field of digital health for STI education in adolescents is experiencing dynamic development. The surge in the early years reflects a rapid response to the need for digitalization, while the decline in the following years could be an indication that the field is beginning to enter a phase of evaluation and refinement of the approach.



Figure 2. Key Data

Bibliometric analysis from 2020 to 2023 shows moderate growth. An annual growth rate of 0.67% indicating stability, not stagnation, indicating a focus on quality and impact. Despite this, the field exhibits strong collaborative dynamics, as evidenced by an average of 8.96 authors per document and 30.8% of international collaborations reflecting strong global networks and multidisciplinary teamwork tendencies. This suggests a globally connected research community with a preference for teamwork over individual authorship—only 70 papers were written by a single author out of a total of 2,026 documents. Scientific impact, the average citation used of 23.18 per document shows a relatively high impact of the published work, even though the average age of the document is only 3.48 years. The existence of 4,232 different author keywords also indicates a diverse and ever-evolving research landscape. However, the absence of reference data can limit deeper insights into citation networks and intellectual structures. Overall, the metrics reflect a dynamic and collaborative research environment with increasing international engagement.

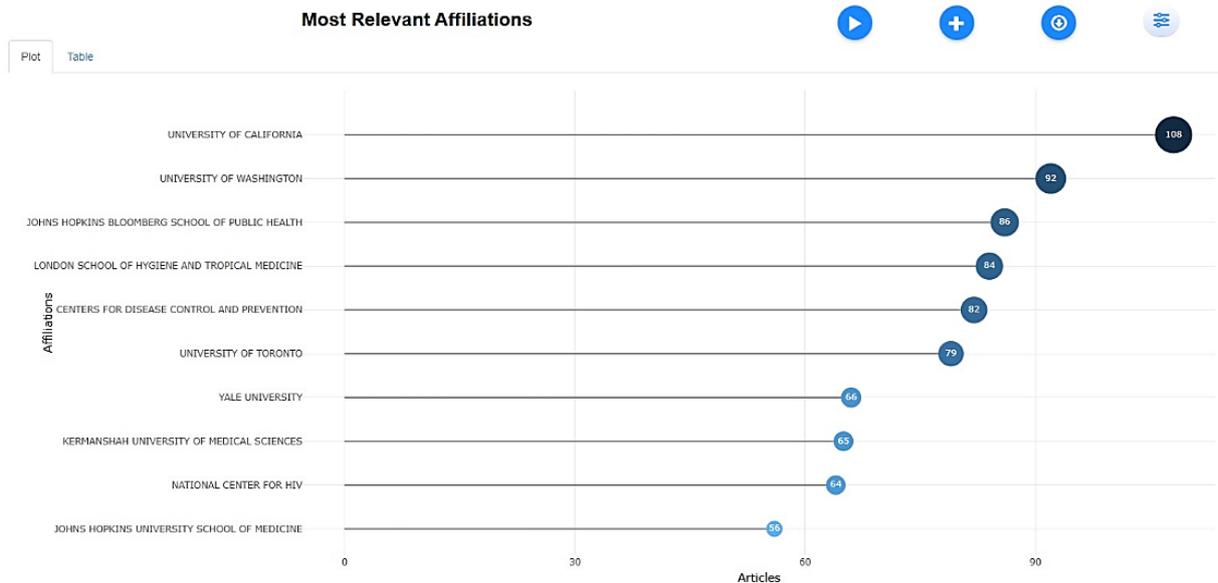


Figure 3. Relevant Affiliates

The University of California emerged as the most relevant institution in this field, with the highest contribution in the form of 108 publications. Following behind him are the University of Washington and the Johns Hopkins Bloomberg School of Public Health, both of which have played a key role in advancing research related to digital health interventions for adolescent sexual health education. Institutions such as the Centers for Disease Control and Prevention (CDC) and the KEMRI-Wellcome Trust Research Programme have also shown strong engagement, underscoring the importance of collaboration between academic institutions and public health bodies in leveraging social media and online platforms to raise awareness about sexually transmitted infections (STIs) among young people globally.

Analysis of search from scopus data on the VOSViewer app to determine what keywords appear most often. VOSViewer software can present and visualize specific information about bibliometric graphs so that it can be easier to interpret a relationship or network (Hutami et al., 2023).

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