Jordan Journal of Nursing Research, Volume **5**, No. **3**, **2026**
DOI: https://doi.org/10.14525/JJNR.2026.26

Jordan Journal of Nursing Research

https://jjnr.just.edu.jo/jjnr

Global Research Trends on Internet Use and Suicide Risk among Adolescents: A Bibliometric Analysis (2021-2025)

Iyus Yosep, S.Kp., M.Si., MSc, PhD [1]*; ***Rohman Hikmat, S.Kep., Ners., M.Kep*** [2]; ***Ai Mardhiyah, S.Kp., M.Kes., PhD*** [3]; ***Roxsana Devi Tumanggor, S.Kep., Ners., M.Nurs*** [4]

1 *Department of Mental Health, Faculty of Nursing, Universitas Padjadjaran, Sumedang, Jawa Barat, Indonesia.*
** Corresponding Author. Email: iyus.yosep@unpad.ac.id*
2 *Faculty of Nursing, Prince of Songkla University, 15 Karnjanavanich Road, Hat Yai District, Songkhla 90110, Thailand.*
3 *Department of Pediatric Nursing, Faculty of Nursing, Universitas Padjadjaran, Sumedang, Jawa Barat, Indonesia.*
4 *Department of Psychiatry and Community Nursing, Faculty of Nursing, Universitas Sumatera Utara, Medan Baru, Kota Medan, Sumatera Utara 20222, Indonesia.*

ARTICLE INFO

Article History:
Received: January 8, 2026
Accepted: May 9, 2026

ABSTRACT

Background: Internet and digital media use has been increasingly associated with depression, self-harm, and suicidal behavior among adolescents. ***Purpose*:** This study aimed to map global publication trends on internet use and suicide risk among adolescents from 2021 to 2025. ***Methods*:** A bibliometric analysis was conducted using the Scopus database based on the Population–Concept–Context framework. The search initially retrieved 1,358 records, of which 50 duplicates were removed. Records published before 2021 (n = 599) were excluded, leaving 709 documents for full assessment and inclusion. The selection process involved duplicate removal, title and abstract screening, and full-text eligibility assessment in accordance with PRISMA-ScR guidelines. Publication trends, productive countries and institutions, document types, subject areas, and keyword patterns were analyzed. Network visualizations were generated using VOSviewer, version 1.6.18. ***Results*:** Publications showed an increasing trend from 2021 to 2025, with a peak in 2025. The United States and China dominated global output, with leading contributions from institutions, such as the University of Melbourne and Harvard Medical School. Articles were the most common document type, and Medicine and Psychology were the dominant subject fields. Keyword analysis revealed four main themes: digital addictive behavior, post-pandemic adolescent mental health, clinical and social studies, and risk factors related to suicidal behavior. Overlay mapping showed a shift from pandemic-related topics to a stronger focus on internet addiction and the use of standardized instruments, such as the PHQ-9. Ethical, privacy, and AI governance issues, remained underrepresented. ***Conclusion*:** Research on internet use and suicide risk among adolescents has grown rapidly and shows increasing methodological maturity; however, ethical and governance considerations remain underexplored. ***Implications for Nursing*:** Nurses are well positioned to support early identification, education, and referral for adolescents at risk of suicide related to problematic internet use. These findings highlight the need to integrate standardized screening, digital literacy, and ethical digital mental health approaches into nursing practice.

Keywords: Adolescents, Bibliometric analysis, Internet use, Internet addiction, Scopus; Suicide risk.

What does this paper add?

1. It provides an updated bibliometric overview of research on internet use and suicide risk among adolescents from 2021 to 2025.
2. It shows a growing publication trend, especially after 2022, with the United States and China as the leading contributors.
3. It Identifies four main research themes: digital addictive behavior, adolescent mental health, clinical and social support, and suicidal behavior risk factors.
4. It highlights the increasing role of social media, machine learning, and standardized screening tools in adolescent suicide risk research.
5. It reveals key gaps in ethical governance, privacy protection, data security, shared datasets, and standardized evaluation protocols.

Introduction

Adolescent mental health is a major global concern, as this age group faces various psychological challenges, including depression, anxiety, stress, and risky behaviors, such as self-harm and suicidal ideation (WHO, 2025). Globally, approximately one in seven adolescents aged 10–19 years experiences a mental health disorder, and suicide remains one of the leading causes of death among individuals aged 15–29 years (WHO, 2023). These conditions often go undetected and undertreated due to limited access to mental health services, social stigma, and a lack of mental health professionals (Prawira & Sukmaningrum, 2020). These conditions highlight the urgency of understanding the factors associated with suicide risk among adolescents (Huang & Hu, 2024).

In recent years, internet and digital media use has become an important part of adolescents' lives. Widespread access to social media, digital platforms, online games, and various forms of online interaction has both positive impacts and risks for mental health (Hourani et al., 2023; Yu, 2022). Several studies have shown that excessive or problematic internet use, including internet addiction and exposure to negative content, internet addiction, and exposure to negative content, is associated with increased risk of depression, social isolation, suicidal ideation, and self-harm behavior in adolescents (Peng et al., 2021; Treml et al., 2021). Internet addiction has been associated with increased suicidal tendencies, with an odds ratio of 1.59 (95% CI: 1.29–1.96) (Khatcherian et al., 2022). Furthermore, the dynamics of digital interactions, such as cyberbullying, social comparison, exposure to self-harming content, and pressure to maintain self-image on social media, contribute to emotional distress and suicide risk (Nuñez et al., 2024). These findings emphasize the importance of understanding the relationship between adolescent digital behavior and suicidality.

Despite the growing scientific interest in internet use and suicide risk in adolescents, bibliometric studies specifically mapping the development of knowledge in this area are still limited (Alzayyat et al., 2024). Some previous studies have focused on social media use in mental health, analyzing digital content related to suicide, or using digital technology to detect depressive symptoms, but few have specifically focused on the adolescent population or directly examined the relationship between internet use and suicide risk (Huang & Hu, 2024; Lan et al., 2022; Yosep et al., 2024). Furthermore, existing bibliometric studies tend to focus on general mental health trends in children and adolescents without specifically addressing risky digital behaviors and suicidal ideation.

Bibliometric analysis provides a systematic approach to addressing this gap by mapping research trends, publication productivity, collaboration between researchers and institutions, and identify key themes and emerging issues in the scientific literature. Therefore, this study aims to examine the volume, growth, and geographic distribution of publications related to internet use and suicide risk in adolescents during the period 2021 to 2025. Furthermore, this study aims to visualize research clusters, keyword relationships, and emerging thematic trends in the field. This study is expected to provide a comprehensive overview of the global research landscape and support policy development and further research on adolescent mental health in the digital age.

Methods

Design

This study employed a bibliometric analysis to examine research trends related to internet use and suicide risk among adolescents. Bibliometric analysis is a quantitative method used to evaluate scientific literature by examining citation patterns, author networks, and keyword associations. This approach

allows mapping of knowledge structures, emerging research themes, and collaboration patterns among researchers and institutions. This analysis also helps identify the most influential publications, authors, and journals, thus providing strategic insights for future research and policy directions. The analysis included bibliometric indicators, such as co-authorship networks, keyword co-occurrence, and citation patterns to map knowledge structures and research developments in this field. Although this study used a bibliometric design, the reporting of the search and selection process was guided by the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews) checklist, which is listed in the EQUATOR Network as a relevant reporting guideline for transparent evidence mapping and review reporting.

Data Sources and Search Strategy

The literature search was conducted through Elsevier's Scopus database, as it offers extensive coverage of peer-reviewed publications and is compatible with bibliometric analysis tools, such as VOSviewer. The literature search was conducted using the Scopus database (Elsevier), which provides extensive coverage of peer-reviewed publications and is widely used for bibliometric analysis. The search was limited to the period from January 1, 2021, to December 31, 2025. Partial data for 2025 was included at the time of data extraction.

The inclusion criteria were structured using the Population–Concept–Context (PCC) framework, which is commonly applied in scoping and exploratory reviews to ensure comprehensive coverage of relevant literature.:

1. **Population:** Teenagers or young age groups include adolescents, youth, teens, and young people.
2. **Concept:** Internet use, social media use, internet addiction, problematic internet use, screen time, smartphone use, online activities, and exposure to digital content are related to suicide risk.
3. **Context:** Suicide risk includes suicidal ideation, suicide attempt, self-harm, self-injury, or suicidality-related behavior in the adolescent population.

   The search strategy uses the following strings:

   (TITLE-ABS-KEY ("internet use" OR "online use" OR "internet addiction" OR "problematic internet use" OR "social media use" OR "digital media" OR "screen time" OR "cyber behavior" OR "online activity" OR "internet exposure" OR "social network*" OR "smartphone use")) AND (TITLE-ABS-KEY ("suicide" OR "suicidal ideation" OR "suicide attempt" OR "self-harm" OR "self harm" OR "self-injury" OR "self injury" OR "suicide risk" OR "suicidality")) AND (TITLE-ABS-KEY (adolescent* OR teen* OR youth* OR "young people" OR "young adult*" OR "school-aged" OR "high school student*")).

This search initially identified 1,358 records from the Scopus database. Prior to screening, 50 duplicate records were removed. The remaining 1,308 records were screened, and 599 records published before 2021 were excluded. A total of 709 records were then assessed based on the predefined eligibility criteria, and no records were excluded due to retrieval issues (n = 0). Finally, 709 eligible documents were included in the bibliometric analysis. No language restrictions were applied; therefore, non-English articles were screened using translated titles and abstracts, with automated translation tools used as needed. The study selection followed a multi-stage process in line with the PRISMA-ScR guideline to ensure transparency and reproducibility (Figure 1). Two reviewers independently screened the retrieved records based on the predefined eligibility criteria. Any disagreements were resolved through discussion until consensus was reached. No formal inter-rater agreement measure, such as Cohen’s kappa or percentage agreement, was calculated.

Data Extraction and Coding

The extracted bibliographic data included the article title, author's name, year of publication, journal, and country of affiliation of the first author. Additional bibliometric indicators, such as the number of citations and keywords from the authors, were also captured during the extraction process. Extraction was performed independently by two researchers using a pre-tested extraction sheet to ensure consistency and accuracy. Inter-rater agreement between the two reviewers was assessed using percentage agreement, and discrepancies were resolved through discussion until consensus was reached.

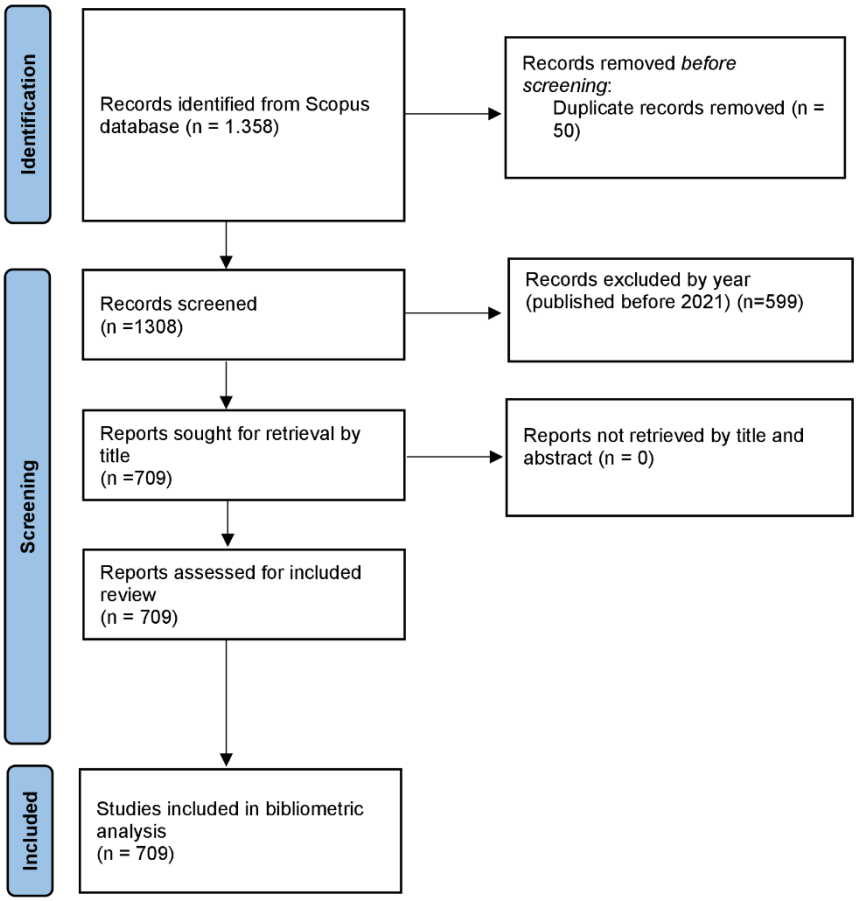

Figure 1. PRISMA flow diagram

Bibliometric and Network Analysis

The analysis includes annual publication trends, the number of articles per year, and publication growth over the study period. The most productive researchers, institutions, countries, and journals are identified along with their citation impact. Collaboration patterns are analyzed through co-authorship networks and institutional affiliations. Keyword linkage analysis is conducted to identify thematic clusters and emerging research areas related to internet use and suicide risk in adolescents. Bibliometric mapping and network visualization were performed using VOSviewer software, version 1.6.18. Descriptive statistical analysis was performed using Microsoft Excel 2021. In VOSviewer, thresholds were applied (e.g., minimum keyword occurrence) to ensure meaningful network construction, and clustering was performed using default resolution parameters.

Statistical Analysis

Descriptive statistical analysis in the form of frequencies and percentages was used to summarize publication characteristics. In addition, annual growth rates were calculated to assess publication trends over time.

Visualization

Visualizations included co-authorship networks, inter-institutional collaboration maps, keyword co-occurrence clusters, and publication trend graphs. Heat maps were used to illustrate geographic distribution. All visualizations were generated using VOSviewer, version 1.6.18 and Microsoft Excel 2021 with standard layout and clustering settings.

Results

The annual publication output showed a gradual increase during the study period. A total of 119 documents were published in 2021, followed by a slight decrease to 117 documents in 2022. Publication output then increased to 142 documents in 2023, 164 in 2024, and reached its highest level in 2025 with 167

documents. This pattern indicates growing research attention, particularly after 2022.

In terms of country contribution, the United States produced the highest number of publications (n = 210), followed by China (n = 133), the United Kingdom (n = 60), Australia (n = 46), and India (n = 44). Other countries in the top ten included Canada (n = 39), Spain (n = 34), Italy (n = 30), and South Korea (n = 27). These findings suggest that publication output was mainly concentrated in the United States and China, with additional contributions from several English-speaking, European, and Asian countries.

Author productivity was relatively evenly distributed. Hamilton JL and Yip PSF were the most productive authors, each contributing seven documents, followed by Wan Y with six documents. Several authors, including Berk M, Burke TA, Nesi J, Patton G, Robinson J, Shen Y, and Xiang YT, each contributed five documents. This indicates that the field is supported by a relatively broad group of active researchers rather than being dominated by one or two authors.

The University of Melbourne had the highest number of publications (n = 21), followed by Harvard Medical School (n = 18) and the Second Xiangya Hospital of Central South University (n = 17). Other productive affiliations included the Ministry of Education of the People's Republic of China (n = 14), Rutgers University–New Brunswick (n = 12), The University of Hong Kong (n = 11), Sichuan University (n = 11), and Massachusetts General Hospital (n = 11). Overall, leading institutions were distributed across Australia, the United States, China, and Hong Kong.

Articles were the most common document type, accounting for 546 documents (77.0%), followed by reviews (n = 73; 10.3%), conference papers (n = 43; 6.1%), and book chapters (n = 19; 2.7%). Other document types, including editorials, notes, books, letters, short surveys, and errata, contributed only small proportions. This indicates that journal articles were the primary mode of knowledge dissemination in this field.

Regarding subject categories, Medicine accounted for the largest proportion of publications (n = 506; 43.5%), followed by Psychology (n = 210; 18.0%) and Social Sciences (n = 95; 8.2%). These three categories represented nearly 70% of the total output. Additional contributions came from Computer Science, Neuroscience, Environmental Science, Arts and Humanities, Nursing, Engineering, Multidisciplinary fields, and other subject areas, indicating that the topic is multidisciplinary, but remains primarily grounded in clinical, behavioral, and social sciences.

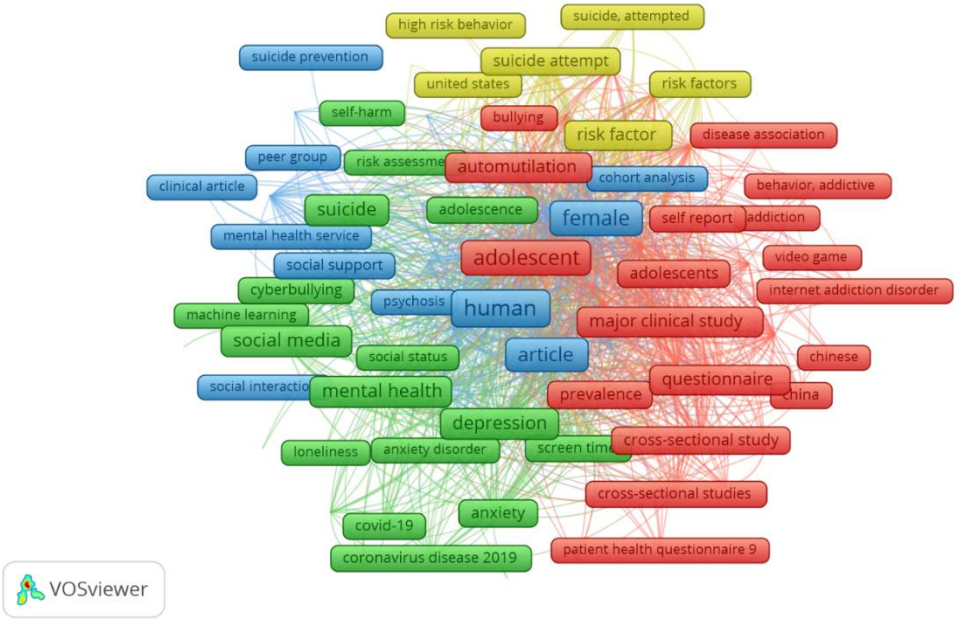

Figure 2. VOSviewer keyword co-occurrence network

Notes. The VOSviewer keyword co-occurrence map shows that adolescents and high-risk populations were central themes in the analyzed literature, as indicated by the large and highly connected nodes for adolescent,

human, and female (Figure 2). Four thematic clusters were identified (Table 1). The red cluster focused on adolescent epidemiology and addictive behaviors, including internet addiction, video games, bullying, self-injurious behavior, and cross-sectional studies. The green cluster represented mental health, the pandemic, and adolescent well-being, with keywords, such as depression, anxiety, loneliness, social media, COVID-19, and machine learning. The blue cluster reflected clinical and social support dimensions, including mental health services, peer groups, social support, self-harm, and suicide prevention. The yellow cluster focused on risk factors and suicidal behavior, including high-risk behavior, substance use, suicidal ideation, and suicide attempts.

Several central nodes, particularly adolescent and human, connected multiple clusters, suggesting that young populations served as a common focus across the research themes. Technology-related terms, such as machine learning and social media, also appeared as bridging concepts between mental health issues, behavioral risks, and intervention-related topics. However, terms related to ethics, data governance, shared datasets, and standardized evaluation protocols were less visible, indicating potential gaps for future research.

The overlay visualization suggests a temporal shift in research focus. Earlier topics were mainly related to COVID-19, anxiety, and depression, reflecting the post-pandemic emphasis on mental health impacts. More recent topics were more strongly associated with social media, machine learning, suicide prevention, self-harm, internet addiction, prevalence studies, and standardized instruments, such as the Patient Health Questionnaire-9. Overall, the research agenda appears to have shifted from broad pandemic-related mental health concerns toward more specific behavioral, technological, and measurement-focused topics.

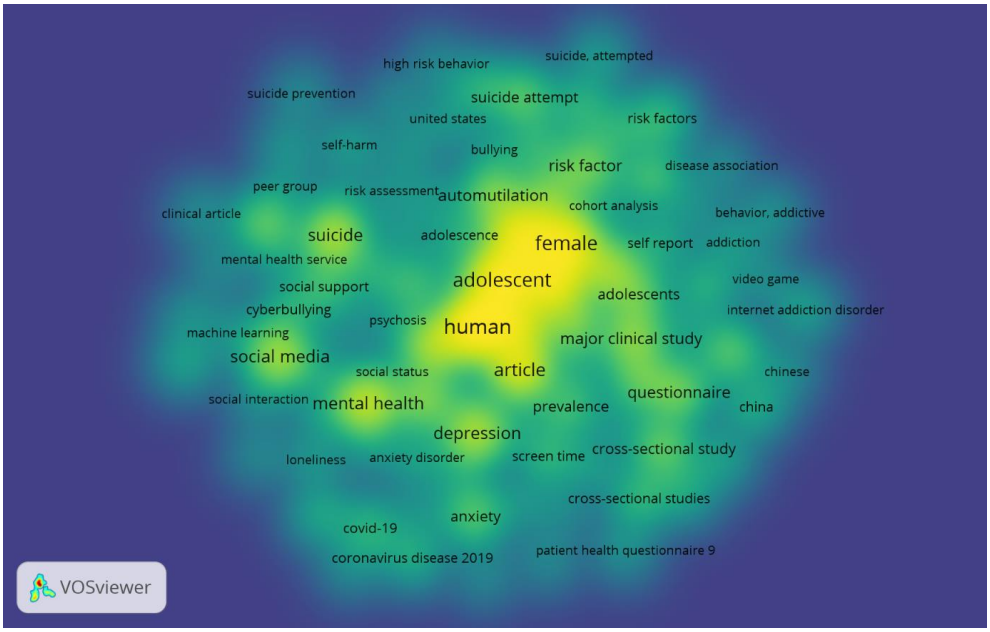

Figure 3. Visualization of keyword co-occurrence density

Notes. This VOSviewer density map shows three main focus areas (hotspots) highlighted in bright yellow, which represent the highest keyword densities and are the core of interest in the corpus (Figure 3). First, the population and mental health cluster. The densest areas appear around the adolescent, human, and female nodes. These hotspots are closely linked to depression, mental health, anxiety, and suicide, indicating a particularly strong focus on symptom detection and clinical support for adolescent populations, particularly those at risk. Other dense nodes, such as articles and major clinical studies, indicate that these topics have been well documented in the primary scientific literature.

Second, the core of high-risk behavior and methodology. Density is seen around risk factors, automutilation, and cohort analysis, suggesting an intensive research focus on identifying risk factors and using cohort study designs for self-destructive behavior and related problems.

Third, the core of social media and addiction. Hotspots are seen around social media, social interaction, machine learning, and internet addiction disorder, demonstrating the increasingly dominant role of technology and social media, both as research subjects (addiction) and as intervention tools.

Medium-density areas (light green),, such as suicide prevention, high-risk behavior, bullying, peer groups, and clinical articles located on the periphery, indicate important issues that complement the dense core. Low-density nodes (purple-blue),, such as COVID-19 and coronavirus disease 2019 at the bottom, indicate that despite the catalytic nature of the pandemic crisis, the focus has shifted to more specific intervention and behavioral studies. Overall, this density visualization reveals a literature ecosystem centered on mental health and risk behavior among adolescents, with a mature research agenda on risk identification, clinical studies, and social media integration.

Table 1. Classification of theme

Cluster	Research Theme	Number of Items	Keywords
Cluster 1	**Addictive Behavior and Adolescent Epidemiology**	35	addiction, adolescent, adolescent behavior, adolescents, automutilation, behavior, addictive, bullying, child, china, chinese, cross-sectional studies, cross-sectional study, demographics, disease association, epidemiology, humans, internet, internet addiction, internet addiction disorder, internet use, likert scale, major clinical study, non-suicidal self-injury, patient health questionnaire, prevalence, psychology, questionnaire, school, self report, self-injurious behavior, sex differences, student, students, surveys and questionnaire, video games
Cluster 2	**Mental Health, the Pandemic, and Adolescent Well-Being**	34	adolescence, anxiety, anxiety disorder, coronavirus disease 2019, covid-19, cyberbullying, depression, distress syndrome, eating disorder, emotion, loneliness, machine learning, mental health, pandemic, pandemics, physical activity, physiological stress, posttraumatic stress disorder, psychological well-being, review, risk assessment, screen time, self esteem, self-harm, sleep, sleep disorder, social isolation, social media, social networking (online), social status, suicide, systematic review, violence, youth
Cluster 3	**Clinical and Social Studies of Adults**	22	adult, article, clinical article, cohort analysis, controlled study, female, follow up, human, longitudinal study, male, mental illness, mental disorders, mental health service, middle aged, peer group, psychosis, qualitative research, social interaction, social network, social support, suicide prevention, young adult
Cluster 4	**Risk Factors and Suicidal Behavior**	11	alcohol consumption, drug dependence, high risk behavior, risk factors, risk factors, substance use, suicidal behavior, suicidal ideation, suicide attempt, suicide, attempted, united states

Discussion

The findings of this study indicate a substantial increase in global research output on internet use and suicide risk among adolescents during the period 2021–2025. The sharp rise in publications, particularly from 2023 onwards, suggests growing scientific and policy attention to adolescent mental health in the digital era (Guo et al., 2020). This trend is consistent with previous studies highlighting the increasing integration of digital behavior into mental health research (Z. Huang & Hu, 2024).

The dominance of journal articles (77.0%) indicates that the field is largely driven by peer-reviewed empirical research, reflecting a relatively mature and evidence-oriented knowledge base. In terms of disciplinary distribution, Medicine (43.5%) and

Psychology (18.0%) were the leading subject areas, suggesting that research on this topic is primarily grounded in clinical and behavioral sciences. However, the presence of Computer Science (6.0%) also indicates the growing role of technology, particularly in areas, such as machine learning, digital monitoring, and intervention development.

The keyword co-occurrence network (Figure 2) reveals four major thematic clusters, including addictive behaviors, mental health and pandemic-related issues, clinical and social studies, and suicide risk factors. The strong linkage between keywords, such as *internet addiction disorder*, *self-harm*, and *suicide*, suggests that problematic internet use is consistently examined as a significant correlate of suicidal behavior among adolescents. These findings align with prior literature indicating that excessive digital engagement may be associated with increased psychological distress and suicidality (Chamarro et al., 2024; Yosep et al., 2026).

The temporal overlay analysis (Figure 1) suggests a shift in research focus over time. Earlier studies were dominated by pandemic-related themes, such as COVID-19 and anxiety, while more recent studies emphasized structured measurement approaches, including the use of standardized instruments, such as the Patient Health Questionnaire-9 (PHQ-9). This transition indicates a movement from exploratory research toward more methodologically rigorous and clinically oriented studies (Exner-Cortens et al., 2021; Moon et al., 2021).

However, the observed increase in publication output and the shift toward technology-related keywords should be interpreted cautiously. This trend may not solely reflect a substantive increase in suicide risk related to internet use among adolescents, but may also be influenced by broader changes in research priorities, greater attention to adolescent mental health after the COVID-19 pandemic, and the expansion of digital health scholarship (Chong et al., 2024; Hikmat et al., 2025). In addition, bibliometric patterns can be shaped by database coverage, keyword indexing practices, and the growing use of standardized terminology in digital mental health research (Hamadneh, 2023; Khan et al., 2024). Therefore, while the findings suggest an emerging research focus on internet use, adolescent mental health, and suicide risk, they should be understood as patterns of scholarly attention rather than direct evidence of changes in clinical prevalence or causal relationships.

The density visualization (Figure 3) further highlights three main research hotspots: adolescent mental health, high-risk behaviors (e.g., self-harm), and internet addiction. These findings suggest that the literature has increasingly concentrated on identifying risk factors and developing measurable indicators of suicide risk. However, areas, such as ethical governance, privacy, and data security, appear to be underrepresented, indicating a critical gap in the current research landscape (Y. Huang et al., 2020; Lestienne et al., 2021).

This study found significant risks given the sensitivity of the data collected (on suicide attempts and self-harm) connected to digital technologies (Wolitzky-Taylor et al., 2023; Yosep et al., 2023). Interventions involving artificial intelligence components, particularly those monitoring suicide risk, need to be supported by standards, such as SPIRIT AI and CONSORT AI, so that the design and reporting of clinical trials using clinical algorithms adhere to international consensus (Zhang et al., 2024). The emerging policy and practice implications are the need for transparent, privacy-friendly, and accountable interventions, while locating screening tools and behavioral interventions within existing service pathways, so that support for children and adolescents does not operate in isolation from the health system (Dayal et al., 2025; Hikmat et al., 2024).

Despite these contributions, several limitations must be acknowledged. First, this study relied solely on the Scopus database, which may introduce database bias and exclude relevant studies indexed in other sources, such as Web of Science or PubMed. Second, bibliometric analysis focuses on publication patterns and does not assess the methodological quality of included studies or establish causal relationships. Therefore, the findings should be interpreted as descriptive of research trends rather than evidence of causal effects. Third, variations in indexing and keyword usage may affect the completeness of retrieved documents.

Implications for Public Health and Nursing

The findings of this study have important implications for healthcare professionals, particularly nurses, who play a key role in adolescent mental health services. The increasing focus on standardized

instruments, such as the PHQ-9, suggests that routine screening for depression and suicide risk can be integrated into school and primary care settings (Kendrick et al., 2024). Nurses can contribute by implementing early detection strategies, providing mental health education, and facilitating referral pathways for at-risk adolescents (Hughes et al., 2023). In addition, the growing role of digital technologies highlights the need for healthcare professionals to develop competencies in digital health tools and interventions. This includes the ability to evaluate the safety, privacy, and ethical implications of technology-based approaches (Seed et al., 2023). Strengthening digital literacy among adolescents and caregivers is also essential to ensure safe and effective use of online platforms (WHO, 2025). Finally, the limited attention to ethical governance in the literature suggests the need for stronger integration of privacy protection, data security, and ethical standards in future research and practice (Porras-Segovia et al., 2022). Aligning digital mental health interventions with established frameworks and guidelines will be critical to ensuring safe and equitable implementation (Lewis & Cardwell, 2020).

Conclusions

This bibliometric analysis indicates a clear increase in global research on internet use and suicide risk among adolescents during the period 2021–2025, particularly since 2023. The findings show that research output is concentrated in a limited number of countries, especially the United States and China, suggesting potential geographic imbalance in knowledge production. Thematically, the literature is largely focused on the association between problematic internet use and suicide-related behaviors, with increasing use of standardized measurement tools, such as the PHQ-9. These patterns suggest a shift toward more structured and clinically oriented research approaches.

However, important gaps remain, particularly in areas related to ethical governance, privacy, and data security in digital mental health research. In addition, as a bibliometric study, the findings reflect publication trends and do not assess the quality of evidence or establish causal relationships. From a practical perspective, the results highlight the importance of integrating standardized mental health screening and digital interventions into existing service settings, including schools and primary care. Healthcare professionals, especially nurses, have a key role in early detection, education, and safe implementation of digital-based approaches. Future research should focus on expanding geographic representation, strengthening methodological rigor, and developing ethical and governance frameworks to support the safe and equitable use of digital mental health technologies.

Acknowledgements

All authors thank Universitas Padjadjaran for facilitating the conduct of this research.

Conflict of Interests

The authors have no conflict of interests to declare.

Funding or Sources of Financial Support

This research did not receive any external funding.

Author Contributions

Study Design: **IY, RH**. Data Collection: **AM, RDT**. Data Analysis: **IY, RH**. Study Supervision: **IY, RH**. Manuscript Writing: **IY, AM, RDT**. Critical Revision for Important Intellectual Content: **IY, RH, RDT**.

REFERENCES

Alzayyat, A., Alzayyat, A., Malkawi, B.I., Al-Smadi, S., Al-Momani, S.M., & Al-Shawabkeh, J.D. (2024). Internet use patterns, internet addiction, and anxiety among youth in Jordan: A cross-sectional study. *Jordan Journal of Nursing Research*, *3*(3), 206-220. https://doi.org/10.14525/JJNR.v3i3.04

Chamarro, A., Díaz-Moreno, A., Bonilla, I., Cladellas, R., Griffiths, M.D., Gómez-Romero, M.J., & Limonero, J.T. (2024). Stress and suicide risk among adolescents: The role of problematic internet use, gaming disorder and emotional regulation. *BMC Public Health*, *24*(1), 326. https://doi.org/10.1186/s12889-024-17860-z

Chong, M.K., Hickie, I.B., Ottavio, A., Rogers, D., Dimitropoulos, G., LaMonica, H.M., Borgnolo, L. J., McKenna, S., Scott, E., & Iorfino, F. (2024). A digital approach for addressing suicidal ideation and behaviors in youth mental health services: Observational study. *Journal of Medical Internet Research*, *26*. https://doi.org/10.2196/60879

Dayal, R.R., Yang, P.L., Sisson, L.N., Bajaj, M., Archuleta, S., Yao, S., Park, D.H., Fujii-Rios, H., & Haroz, E.E. (2025). Exploring the perspectives of pediatric health care providers, youth patients, and caregivers on machine learning suicide risk classification: Mixed method study. *Journal of Medical Internet Research*, *27*(1). https://doi.org/10.2196/57602

Exner-Cortens, D., Baker, E., Gray, S., Conde, C.F., Rivera, R.R., Van Bavel, M., Vezina, E., Ambrose, A., Pawluk, C., Schwartz, K.D., & Arnold, P.D. (2021). School-based suicide risk assessment using ehealth for youth: Systematic scoping review. *JMIR Mental Health*, *8*(9). https://doi.org/10.2196/29454

Guo, W., Tao, Y., Li, X., Lin, X., Meng, Y., Yang, X., Wang, H., Zhang, Y., Tang, W., Wang, Q., Deng, W., Zhao, L., Ma, X., Li, M., Chen, T., Xu, J., Li, J., Hao, W., Lee, S., …, & Li, T. (2020). Associations of internet addiction severity with psychopathology, serious mental illness, and suicidality: Large-sample cross-sectional study. *Journal of Medical Internet Research*, *22*(8). https://doi.org/10.2196/17560

Hamadneh, S. (2023). The role of using social media and technology applications in continuous health education programs following COVID-19 crisis. *Jordan Journal of Nursing Research*, *2*(3), 182-187. https://doi.org/10.14525/JJNR.v2i3.03

Hikmat, R., Suryani, S., Yosep, I., Hernawaty, T., Widianti, E., Rafiyah, I., & Sutini, T. (2024). School program integrated with nursing intervention for reducing bullying behavior among students: A narrative review. *Environment and Social Psychology*, *9*(3). https://doi.org/10.54517/esp.v9i3.2109

Hikmat, R., Yosep, I., Mardhiyah, A., Kurniawan, K., & Syabana, M.N. (2025). A scoping review of school-based psychological interventions for adolescent mental health in secondary education: addressing anxiety, depression, and well-being. *Discover Mental Health*. https://doi.org/10.1007/s44192-025-00336-w

Hourani, E.M., Hammad, S.M., Albqoor, M.J., & Shaheen, A. M. (2023). Health promotion and social support of Jordanian adolescents during COVID-19 pandemic. *Jordan Journal of Nursing Research*, *2*(3), 230-238. https://doi.org/10.14525/JJNR.v2i3.07

Huang, Y., Xu, L., Mei, Y., Wei, Z., Wen, H., & Liu, D. (2020). Problematic internet use and the risk of suicide ideation in Chinese adolescents: A cross-sectional analysis. *Psychiatry Res*, *290*. https://doi.org/10.1016/j.psychres.2020.112963

Huang, Z., & Hu, Q. (2024). Tree hole rescue: An AI approach for suicide risk detection and online suicide intervention. *Health Information Science and Systems*, *12*(1). https://doi.org/10.1007/s13755-024-00298-3

Hughes, J.L., Horowitz, L.M., Ackerman, J.P., Adrian, M.C., Campo, J.V, & Bridge, J.A. (2023). Suicide in young people: Screening, risk assessment, and intervention. *BMJ*, *381*. https://doi.org/10.1136/bmj-2022-070630

Kendrick, T., Dowrick, C., Lewis, G., Moore, M., Leydon, G.M., Geraghty, A.W., Griffiths, G., Zhu, S., Yao, G.L., May, C., Gabbay, M., Dewar-Haggart, R., Williams, S., Bui, L., Thompson, N., Bridewell, L., Trapasso, E., Patel, T., McCarthy, M., …, & Stuart, B. (2024). Depression follow-up monitoring with the PHQ-9: An open cluster-randomised controlled trial. *The British Journal of General Practice: The Journal of the Royal College of General Practitioners*, *74*(744), e456-e465. https://doi.org/10.3399/BJGP.2023.0539

Khan, A., Yousafzai, A.W., & Bantjes, J. (2024). Framework for suicide prevention among college students in low-and middle-income countries. *Khyber Medical University Journal*, *16*(3), 270-273. https://doi.org/10.35845/kmuj.2024.23563

Khatcherian, E., Zullino, D., De Leo, D., & Achab, S. (2022). Feelings of loneliness: Understanding the risk of suicidal ideation in adolescents with internet addiction: A theoretical model to answer to a systematic literature review, without results. In *International Journal of Environmental Research and Public Health*, *19*(4). https://doi.org/10.3390/ijerph 19042012

Lan, M., Law, N., Pan, Q., Gaffney, H., Farrington, D.P., Espelage, D.L., Ttofi, M.M., Fekkes, M., van de Sande, M.C.E., Gravesteijn, J. C., Pannebakker, F.D., Buijs, G.J., Diekstra, R.F.W., Kocken, P.L., Cross, D., Shaw, T., Hadwen, K., Cardoso, P., Slee, P., …, & Gonzalez-Villora, S. (2022). Cyberbullying in elementary and middle school students: A systematic review. *Computers & Education*, *18*(5), 53-66. https://doi.org/https://doi.org/10.1016/j.compedu.2021.104356

Lestienne, L., Leaune, E., Haesebaert, J., Poulet, E., & Andriessen, K. (2021). An integrative systematic review of online resources and interventions for people bereaved by suicide. *Preventive Medicine*, *152*, 106583. https://doi.org/https://doi.org/10.1016/j.ypmed.2021.106583

Lewis, E.G., & Cardwell, J.M. (2020). The big five personality traits, perfectionism and their association

with mental health among UK students on professional degree programmes. *BMC Psychology*, *8*(1), 54. https://doi.org/10.1186/s40359-020-00423-3

Moon, K.C., van Meter, A.R., Kirschenbaum, M.A., Ali, A., Kane, J.M., & Birnbaum, M.L. (2021). Internet search activity of young people with mood disorders who are hospitalized for suicidal thoughts and behaviors: Qualitative study of google search activity. *JMIR Mental Health*, *8*(10). https://doi.org/10.2196/28262

Nuñez, D., Meza, D., Andaur, J., Robinson, J., & Gaete, J. (2024). Reframe-IT+, an indicated preventive school-based intervention, reduces suicidal ideation among adolescents in vulnerable contexts in Chile. *BMC Psychology*, *12*(1), 780. https://doi.org/10.1186/s40359-024-02300-9

Peng, C., Wang, M., Cheng, J., Tan, Y., Huang, Y., Rong, F., & Yu, Y. (2021). Association between internet addiction and suicidal ideation, suicide plans, and suicide attempts among Chinese adolescents with and without parental migration. *Computers in Human Behavior*, *125*. https://doi.org/10.1016/j.chb.2021.106 949

Porras-Segovia, A., Díaz-Oliván, I., Barrigón, M. L., Moreno, M., Artés-Rodríguez, A., Pérez-Rodríguez, M. M., & Baca-García, E. (2022). Real-world feasibility and acceptability of real-time suicide risk monitoring via smartphones: A 6-month follow-up cohort. *Journal of Psychiatric Research*, *149*(January), 145-154. https://doi.org/10.1016/j.jpsychires.2022.02.026

Prawira, B., & Sukmaningrum, E. (2020). Suicide stigma as a predictor of help-seeking intention among undergraduate students in Jakarta. *Makara Human Behav Studies Asia*, *24*. https://doi.org/10.7454/hubs.asia.1200120

Seed, P.T., Brien, S.B., Oakley, L.L., Robinson, V., Sharif, J., Thompson, H., Joseph, J., & Oteng-Ntim, E. (2023). Serial prophylactic exchange blood transfusion in pregnant women with sickle cell disease (TAPS-2): Statistical and qualitative analysis plan for a randomised controlled feasibility trial. *Trials*, *24*(1), 225. https://doi.org/10.1186/s13063-023-07235-x

Treml, J., Nagl, M., Linde, K., Kündiger, C., Peterhänsel, C., & Kersting, A. (2021). Efficacy of an internet-based cognitive-behavioural grief therapy for people bereaved by suicide: A randomized controlled trial. *European Journal of Psychotraumatology*, *12*(1), 1926650. https://doi.org/10.1080/20008198.20211.1926650

WHO. (2023). *World Suicide Prevention Day: "Creating Hope through Action"*. https://www.who.int/

WHO. (2025). *Suicide*. https://www.who.int/news-room/fact-sheets/detail/suicide/

Wolitzky-Taylor, K., LeBeau, R., Arnaudova, I., Barnes-Horowitz, N., Gong-Guy, E., Fears, S., Congdon, E., Freimer, N., & Craske, M. (2023). A novel and integrated digitally supported system of care for depression and anxiety: Findings from an open trial. *JMIR Mental Health*, *10*. https://doi.org/10.2196/46200

Yosep, I., Hikmat, R., & Mardhiyah, A. (2023). Types of digital-based nursing interventions for reducing stress and depression symptoms in adolescents during COVID-19 pandemic: A Scoping Review. *Journal of Multidisciplinary Healthcare*, *16*, 785-795. https://doi.org/10.2147/JMDH.S406688

Yosep, I., Hikmat, R., Mardhiyah, A., & Hernawaty, T. (2024). A scoping review of digital-based intervention for reducing risk of suicide among adults. *Journal of Multidisciplinary Healthcare*, *17*(null), 3545-3556. https://doi.org/10.2147/JMDH.S472264

Yosep, I., Mardhiyah, A., Lukman, M., Hazmi, H., & Hikmat, R. (2026). Digital mental health interventions for suicide prevention: A scoping review of assessment, monitoring, and treatment approaches. *International Journal of Africa Nursing Sciences*, *25*, 101066. https://doi.org/https://doi.org/10.1016/j.ijans.2026.101066

Yu, T. (2022). Effectiveness of internet-based cognitive behavioral therapy for suicide: A systematic review and meta-analysis of RCTs. *Psychol. Heal. Med.*, *27*. https://doi.org/10.1080/13548506.2021.1930073

Zhang, Y., Wang, D., & Ma, Z. (2024). Problematic internet use and suicide ideation among Chinese adolescents: The indirect effects of insomnia, nightmares, and social jetlag. *J Affect Disord*, *344*. https://doi.org/10.1016/j.jad.2023.10.081