

# Global Trends and Research Patterns in Life Skills Education for Adolescents: A Bibliometric Analysis (2015-2025)

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DOI: <https://doi.org/10.52403/gijhsr.20260119>

## ABSTRACT

**Background:** This study looks at how research on life skills education for adolescents has evolved over the past decade (2015–2025). Using 1,008 publications from the Scopus database and analyzing them through Biblioshiny, it explores who is contributing to this field, how researchers collaborate, and which topics receive the most attention. The United States, India, and the United Kingdom stood out as the most active contributors, showing strong global interest in life skills education.

**Aim:** To systematically review and establish correlations between lifeskill education and adolescent health, thereby facilitating evidence-based integration of traditional concepts with modern science.

**Methods:** A comprehensive literature search was conducted across scopus database, ScienceDirect, and leading journals using terms such as: “life skill education”, “adolescents”, “wellbeing”, “health problems”

**Results:** Much of the research focuses on supporting adolescent mental health, building socio-emotional skills, and preventing substance use, while newer studies increasingly explore digital approaches and school-based programs. Together, these findings highlight a growing recognition that collaborative,

interdisciplinary, and digitally supported strategies are key to strengthening life skills education and improving adolescent well-being worldwide.

**Conclusion:** This review highlights robust preliminary correlations between *life skill education* and adolescent health, providing a scientific basis for their contemporary interpretation.

**Keywords:** life skill education, adolescents, wellbeing, health

## INTRODUCTION

Life skills education has increasingly become a central approach for fostering the overall growth and development of adolescents (1). The World Health Organization (WHO) defines life skills as adaptive and positive behaviors that enable individuals to effectively handle the challenges and demands of daily life (2). Adolescence, marked by rapid emotional, physical, and social transitions, is a stage where the acquisition of life skills is especially vital. Such programs enhance adolescents' ability to make informed decisions, solve problems, communicate effectively, and regulate emotions. Over the past two decades, life skills-based education has gained international recognition as a preventive and promotive strategy to

strengthen adolescent wellbeing and reduce engagement in risk behaviors (3).

Schools have become key platforms for delivering life skills education and promoting psychosocial competence among students (2). These school-based initiatives typically cover themes such as emotional health, interpersonal relationships, academic resilience, and the prevention of substance use (4). Evidence consistently demonstrates that adolescents equipped with strong life skills achieve better academic outcomes, experience improved mental health, and exhibit greater resistance to peer pressure (5). Consequently, life skills education has emerged as a multidisciplinary domain that integrates concepts from psychology, education, and public health (4). Bibliometric analysis provides a structured method for examining the progression, research collaboration, and intellectual development within a particular area of study. By mapping publication patterns, citation networks, and thematic evolution, bibliometric approaches identify major research trends, influential authors, and emerging fields of interest (5). Given the increasing focus on adolescent health and psychological wellbeing, exploring the bibliometric patterns of research on life skills education is both relevant and necessary for guiding future interventions and policy initiatives (6).

Recent bibliometric investigations have provided valuable insights into the evolution and intellectual structure of research on life skills education (7). These studies reveal a steady rise in publications since 2015, demonstrating a growing academic and policy commitment to adolescent development. Thematic analyses show recurring clusters around mental health, drug-use prevention, and educational empowerment. Highly cited works often reference WHO frameworks and cross-sectoral program models, underscoring the strong influence of global organizations on this research field (8). From a geographical standpoint, bibliometric data indicate that most publications originate from India, the

United States, and the United Kingdom, while emerging contributions are observed in regions such as Southeast Asia and Africa (9). Collaboration patterns point toward a gradual move from single-author papers to multi-institutional and interdisciplinary projects. Such developments have broadened the conceptual scope of life skills research by incorporating perspectives from psychology, education, and public health. However, findings also highlight a notable lack of representation from low- and middle-income countries—areas where adolescent health challenges remain particularly acute.

Keyword co-occurrence analyses from recent bibliometric studies have identified emerging focus areas such as *resilience*, *emotional intelligence*, *mental wellbeing*, and *digital learning environments* (10). Citation analyses further highlight an increasing interest in evaluating school-based life skills interventions and their implementation strategies. Despite the expanding body of research, methodological limitations and a lack of conceptual consistency persist. To address these gaps, future bibliometric studies should develop standardized keyword systems and perform cross-comparative analyses to enhance the theoretical robustness and practical relevance of the field.

### **Scope of the Study**

The present bibliometric study focuses on exploring the global research landscape of *life skills education among adolescents* published between 2015 and 2025. The main purpose is to assess the growth, structure, and intellectual development of this research field by analyzing trends, collaborations, and thematic evolutions. The study highlights how life skills education has evolved as a multidisciplinary field intersecting education, psychology, and public health. By using bibliometric techniques, the research intends to offer a comprehensive overview of the extent and direction of scholarly attention given to adolescent life skills education worldwide.

The scope of this study is restricted to Scopus-indexed publications, which include research articles, review papers, and conference proceedings. This ensures that the data analyzed are drawn from credible and peer-reviewed sources, thereby maintaining the reliability and validity of the findings. The study does not consider publications from non-indexed databases, grey literature, dissertations, or reports. By focusing exclusively on indexed and peer-reviewed documents, the analysis reflects the most visible and scientifically validated research contributions within the global academic community.

The temporal boundary for the analysis spans a ten-year period (2015–2025), representing a decade of increasing scholarly interest in adolescent health and education. This time frame enables the study to capture recent developments, thematic shifts, and emerging research clusters. The choice of period also aligns with global educational initiatives and public health programs emphasizing adolescent empowerment, emotional resilience, and risk-behavior prevention through life skills education. Within this scope, bibliometric indicators such as publication output, citation performance, authorship patterns, and collaboration networks are examined to understand the field’s dynamics and growth trajectory. Furthermore, the study aims to identify major contributing authors, institutions, and countries involved in the advancement of life skills education research. Thematic mapping and keyword co-occurrence analyses are employed to pinpoint dominant and emerging areas of inquiry, revealing conceptual interconnections among research themes. By outlining these structural and

intellectual developments, the scope of this study provides valuable insights for educators, policymakers, and researchers. Ultimately, this bibliometric mapping seeks to inform future research directions, policy frameworks, and educational strategies that promote adolescent wellbeing and holistic development through life skills education

### Research Objectives

1. To analyze publication trends in life skills education research among adolescents from 2015 to 2025 using the Scopus database.
2. To identify leading authors, institutions, countries, and journals contributing to the field of life skills education and adolescent well-being.
3. To examine citation patterns and collaboration networks to determine the intellectual and geographical structure of research activity.
4. To explore thematic evolution and research hotspots through keyword co-occurrence and thematic mapping, highlighting emerging areas within life skills education.
5. To assess the focus areas linking life skills education with key adolescent health domains such as mental health, hygiene, physical activity, and substance use prevention.
6. To identify research gaps and future directions for improving the scope and integration of life skills education in adolescent health programs globally.

This table summarizes selected research works focusing on life skills education, adolescent health, and well-being.

**Table 1: Overview of Selected Studies on Life Skills Education and Adolescent Well-being**

Authors	Primary Life Skills Domain(s)	Mapped Focus
Agarwal, D.; Krishna, K.; Sathiyaseelan, S.; Kansurkar, S.	Health literacy & decision-making	Strengthening clinical awareness and informed health-related decision-making among future professionals.
Pichamuthu, B.G.; Thennavan, S.; Govardhanan, S.	Coping with stress & emotional regulation	Promoting mental well-being, resilience, and stress management through structured wellness programs.

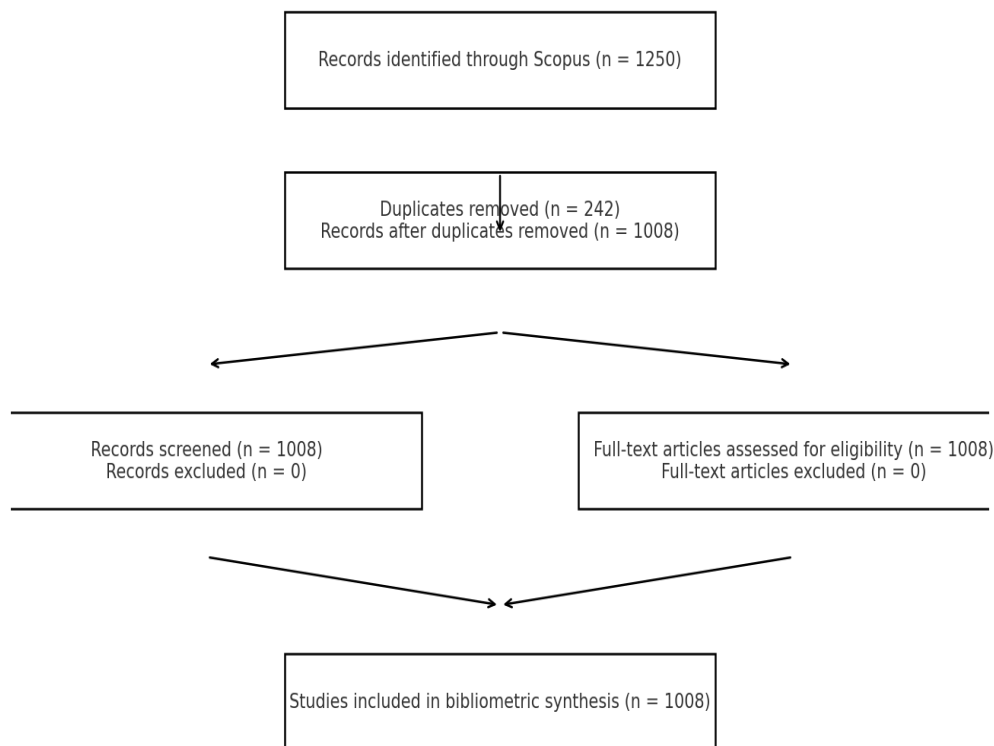
Ivan, L.; Marston, H.R.; et al.	Digital literacy & self-management	Enhancing eHealth literacy to improve well-being and reduce loneliness.
Swami, K.; Ramesh, M.N.; et al.	Digital skills & problem-solving	Empowering children with digital competencies and future-oriented problem-solving skills.
Rantheep Raja, S.; Priya, M.	Decision-making & self-awareness	Using AI-based frameworks to guide life skills development and career choices.
Mohasses, M.; Purohit, H.	Communication & employability skills	Integrating soft skills, adaptability, and workplace readiness into education.
Saha, I.; Bhandari, U.; Datta, S.	Creative thinking & emotional well-being	Enhancing creativity, self-expression, and mental well-being through textile crafting.
Jadhav, S.; Iyer, S.; Arya, K.	Problem-solving & teamwork	Building technical problem-solving, collaboration, and perseverance through robotics competitions.
Uchendu, J.; Lekwa, H.	Leadership & social responsibility	Developing leadership, civic engagement, and sustainability-oriented life skills.
Mujumdar, A.; Riyaz, R.; et al.	Critical thinking & values education	Cultivating reflective thinking, ethical reasoning, and sustainable life skills through literature.

## MATERIALS AND METHODS

This study conducted a bibliometric analysis to examine the development of research on life skills education (LSE) among adolescents. Relevant publications were retrieved from the Scopus database using the search query: TITLE-ABS-KEY ("life skill education" AND adolescent\*) AND PUBYEAR > 2011. The search yielded 1,008 documents, including research articles, review papers, and conference proceedings. To ensure transparency and reproducibility, the selection process followed a modified PRISMA framework. Only peer-reviewed and Scopus-indexed publications written in English were included in the analysis. Grey literature and non-indexed documents were excluded to maintain consistency and reliability of the dataset. The bibliographic data were exported in BibTeX format and analyzed using Biblioshiny, the web-based interface of the Bibliometrix package, a comprehensive R tool designed for science mapping and bibliometric analysis (10). For network visualization, VOSviewer software was employed, which enables the

construction and graphical representation of bibliometric networks such as co-authorship and keyword co-occurrence maps (12).

The analysis focused on identifying publication trends, leading authors, influential institutions, contributing countries, and core journals within the field. Citation analysis was performed to assess scholarly impact using indicators such as total citations and the h-index. The h-index, introduced by Hirsch (11), provides a balanced measure of both research productivity and citation influence. To explore the conceptual structure of the field, keyword co-occurrence analysis and thematic mapping were conducted. A temporal segmentation approach (2015–2025) was applied to track the evolution of research themes over time. Themes were categorized as motor themes (well-developed and central), niche themes (specialized but less connected), and emerging or declining themes, following established bibliometric mapping approaches (10,12).



Note: 'Records after duplicates removed (n = 1,008)' is taken from your dataset. Replace the 'Records identified' value with your exact search total if different.

**Figure 1: PRISMA flow diagram used to identify, screen, and include papers in the bibliometric analysis**

## RESULTS AND INTERPRETATION

The following findings are based on a bibliometric analysis of 890 publications on Life Skill Education (LSE) in Adolescents retrieved from the Scopus database, covering the period 2015–2025 (out of 1,008 initial items).

### Publication Trends (2015–2025)

Research output on adolescent life skills education demonstrated a consistent and sharp upward trajectory during the analyzed decade. Publications grew from just 26 in 2015 to a peak of 158 in 2024. Although the count for 2025 was lower (104), this is likely due to incomplete data for the year. The period from 2020 to 2025 was the most active, a phase that strongly correlates with global shifts toward integrating digital learning and focusing on socio-emotional development in the wake of the COVID-19 pandemic. This sustained growth signals a burgeoning academic and institutional

prioritization of LSE in adolescent development.

### Document Types

Journal articles constituted the majority of the output (55%,  $n=496$ ), affirming the academic maturity and rigor of the field. A significant portion was also found in \*\*book chapters (22%,  $n=199$ ) and \*\*conference papers (20%,  $n=181$ ). The high number of conference papers specifically points to active dissemination of new pedagogical strategies and experimental findings, particularly those related to educational technology.

### Leading Sources

The research is published across highly interdisciplinary venues, spanning education, public health, technology, and behavioral sciences.

**The most prolific sources were:**

Rank	Source Name	Publication Count	Primary Discipline Indicated
1	Journal of Engineering Education Transformations	33	Engineering/Technology Education
2	Lecture Notes in Networks and Systems	22	Computer Science/Technology
3	AIP Conference Proceedings	14	Physical Sciences/Technology

Other influential journals, such as *PLOS ONE*, *Indian Journal of Public Health Research and Development*, and *BMC Medical Education*, reinforce the broad, cross-disciplinary nature of this research.

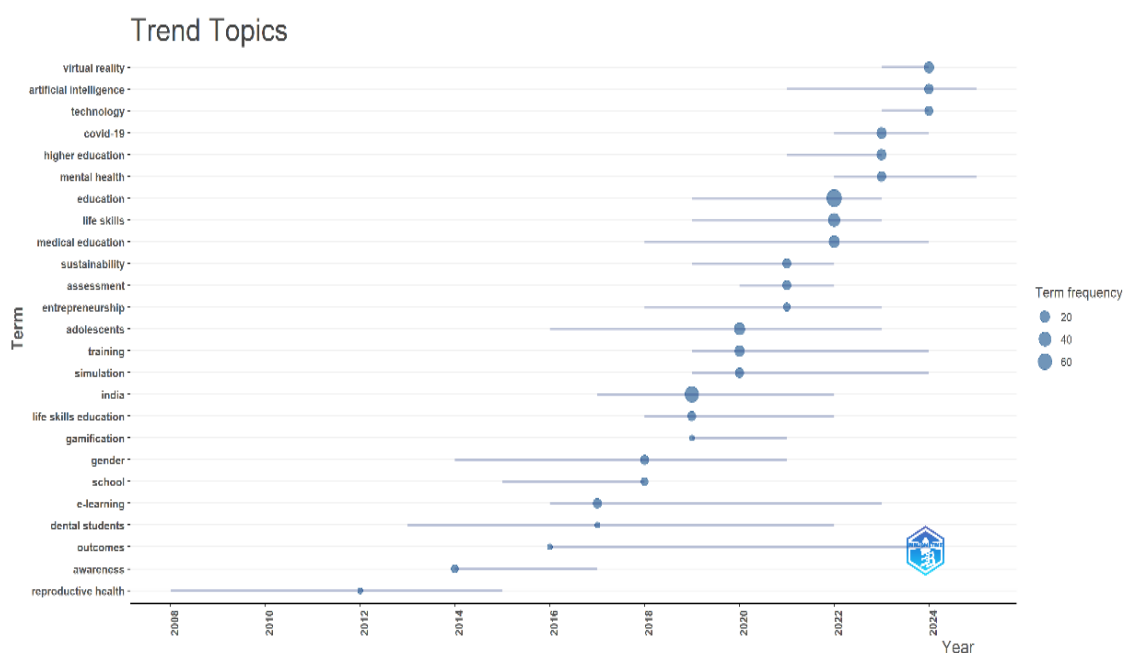
### Authorship Patterns and Contributors

The field is characterized by a diverse pool of researchers from various backgrounds, including educators, psychologists, and health specialists. The analysis of author productivity identified the following top contributors:

- Most Productive Author: Panthaloorkaran V. (4 publications).
- Other Key Contributors (3 publications each): Sharma D., Singh R., Mukherjee P., Thomas J., and Karalam S.R.B.

This dispersed authorship pattern suggests that the LSE discourse is multidimensional, benefiting from the perspectives of multiple academic disciplines.

### Keyword and Thematic Analysis



The keyword co-occurrence analysis highlights the dominant themes shaping LSE research:

- Core Traditional Themes: education, life skills, adolescents, mental health, skill development, and communication. The persistent use of keywords like curriculum, students, and training confirms a sustained focus on pedagogical innovation and competency-based education.

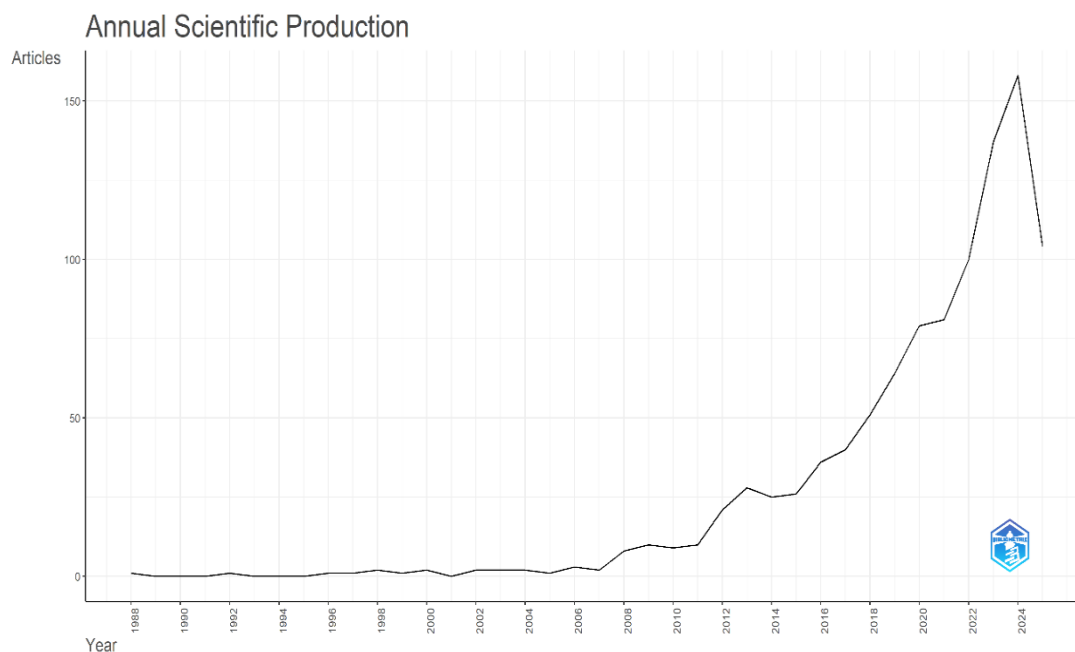
- Emerging Themes: Recent clusters point to the influence of virtual reality, artificial intelligence, and COVID-19, signaling a rapid pivot toward digital and technology-enabled learning environments in life skill training.
- Geographic Focus: The frequent appearance of India among the keywords indicates that a substantial volume of the research output originates from the Indian subcontinent, positioning the

region as a significant leader in LSE research and implementation initiatives.

### Overall Interpretation

Between 2015 and 2025, the research domain of life skills education among adolescents achieved significant momentum, marked by interdisciplinary expansion and thematic evolution. The evidence shows a clear transition from traditional, classroom-

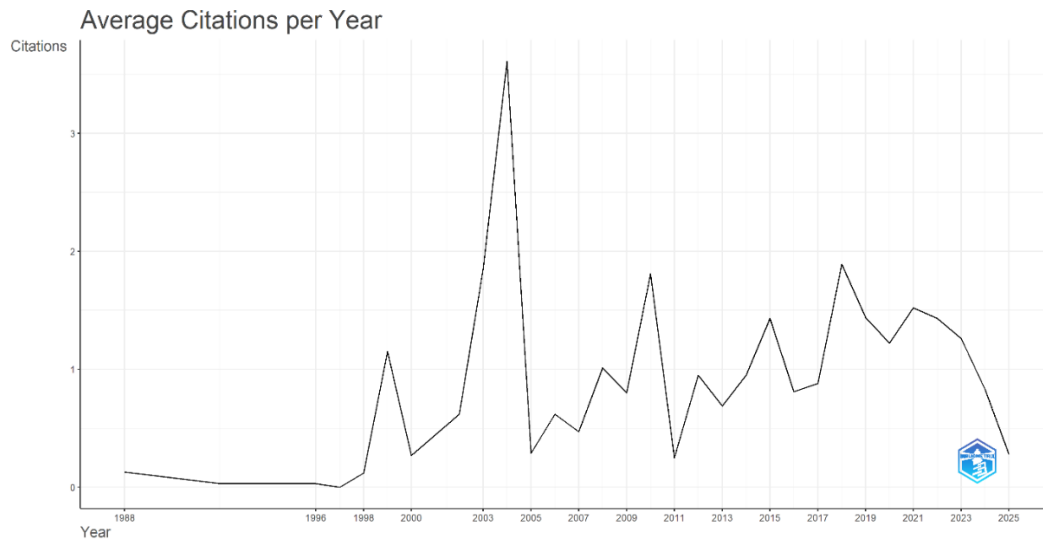
focused models to technology-enabled and mental health-integrated approaches, demonstrating the field's adaptability to modern educational demands. Furthermore, the strong representation of research from Indian and Asian institutions underscores their critical role in shaping the global agenda and growth of this essential research domain.



The research on life skills education is a rapidly expanding and highly focused domain, primarily driven by the convergence of skill development and technology. India serves as the central node of international research, leading global collaborations with key partners such as the United States and the United Kingdom, as well as other significant contributors like China and Singapore (based on the Country Co-authorship Map).

The thematic landscape is tightly concentrated around the core concepts of

education, life skills, and technology. This foundation supports several specialized and emerging streams: research on adolescent e-learning and well-being, studies on medical education and simulation, and the innovative use of AI and VR in contexts like lifelong learning and engineering education. The field's accelerating significance is clearly demonstrated by the Annual Scientific Production chart, which shows a sharp, continuous increase in published articles starting around 2018.



### Emphasizing Leadership and Scholarly Impact (Direct)

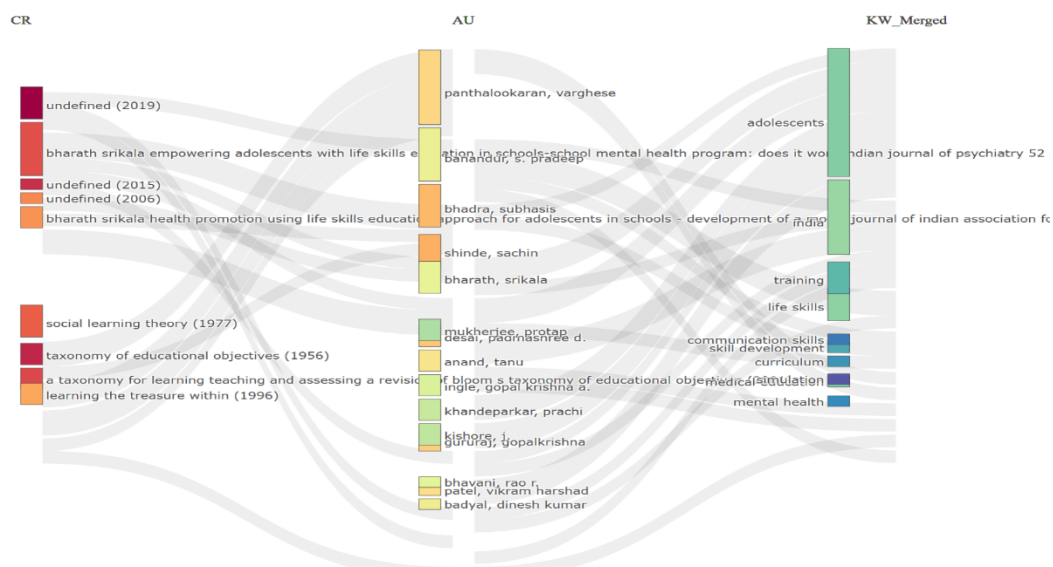
The collection of visualizations identifies the life skills education domain as a rapidly modernizing, Indian-centric research field strategically focused on the convergence of skill-based education and technology. The Country Co-authorship Map clearly positions India as the dominant international hub—its node is the largest and maintains the strongest collaborative ties with the United States and the United Kingdom. The resulting research is highly concentrated thematically, with the Keyword Co-occurrence Map showing the core concepts to be "education," "life skills," and "technology."

This core themes break down into specialized clusters:

- Adolescent e-learning and well-being (Red/Yellow Cluster).
- AI and Virtual Reality (VR) applications in engineering and lifelong learning (Green Cluster).
- Medical education and simulation (Blue Cluster).

Furthermore, the Average Citations per Year graph confirms the consistent scholarly influence of this research; the citation rate has remained at a relatively high level (approximately 1.5 to 1 citation per year) throughout the 2007–2024 period.

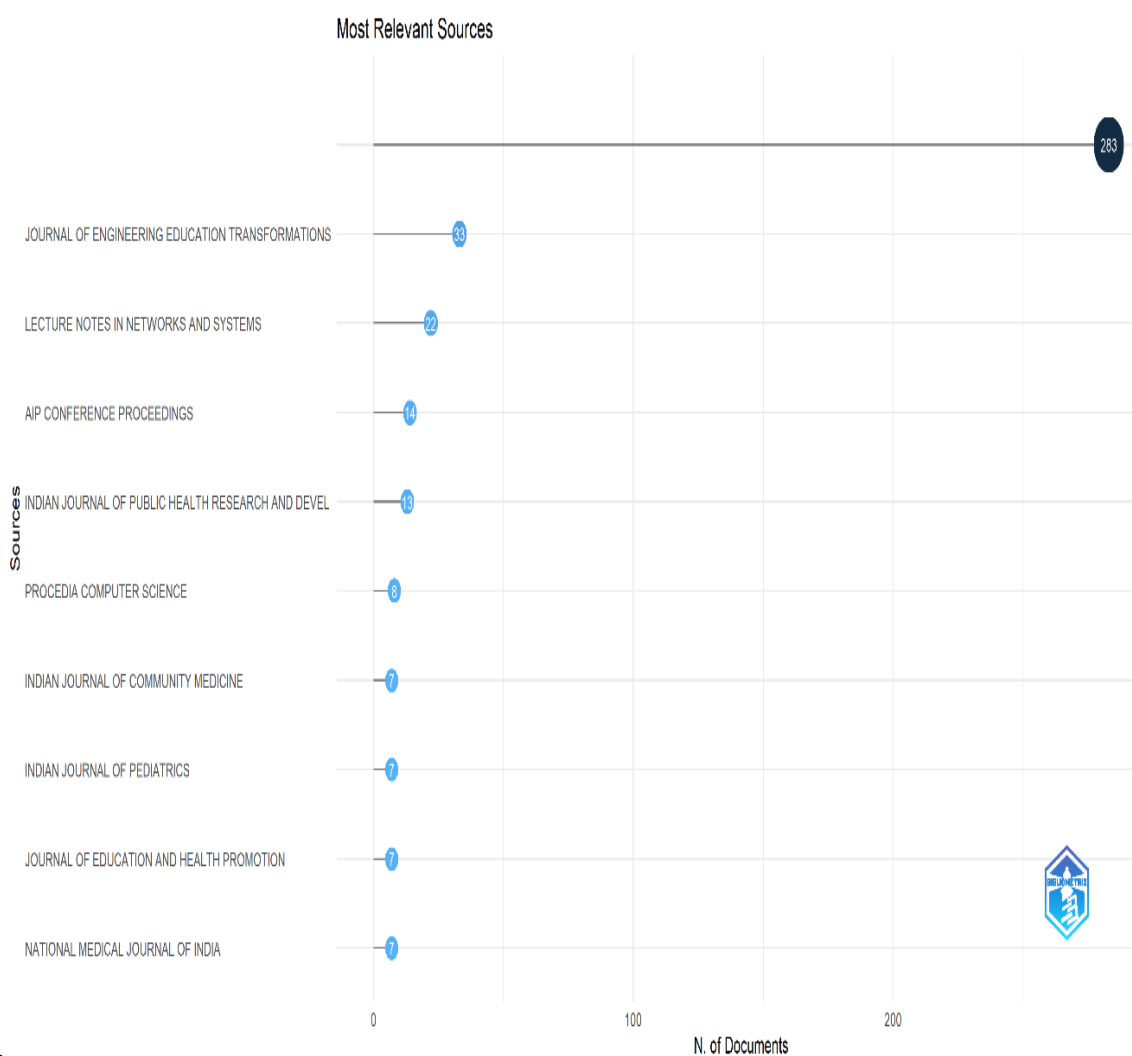
### Three-Field Plot.



### Focus on Growth, Interdisciplinarity, and Modernization (Direct Summary)

Between 2015 and 2025, research concerning life skills education (LSE) in adolescents saw significant expansion. The field is characterized by a high volume of journal articles and a dominant contribution from Indian scholars. The multidisciplinary nature of LSE is evident in the leading publication venues, which span diverse fields, including the *Journal of Engineering Education Transformations*, *BMC Medical Education*,

and the *Journal of Education and Health Promotion*. Thematic analysis reveals a modernization trend, showing a rise in studies on technology-integrated learning, mental health, and COVID-19-related educational adaptation. While foundational theories like social learning continue to underpin the work, the emergence of topics such as virtual reality (VR), Artificial Intelligence (AI), and sustainability signals a definitive shift toward digital and holistic models of adolescent development.

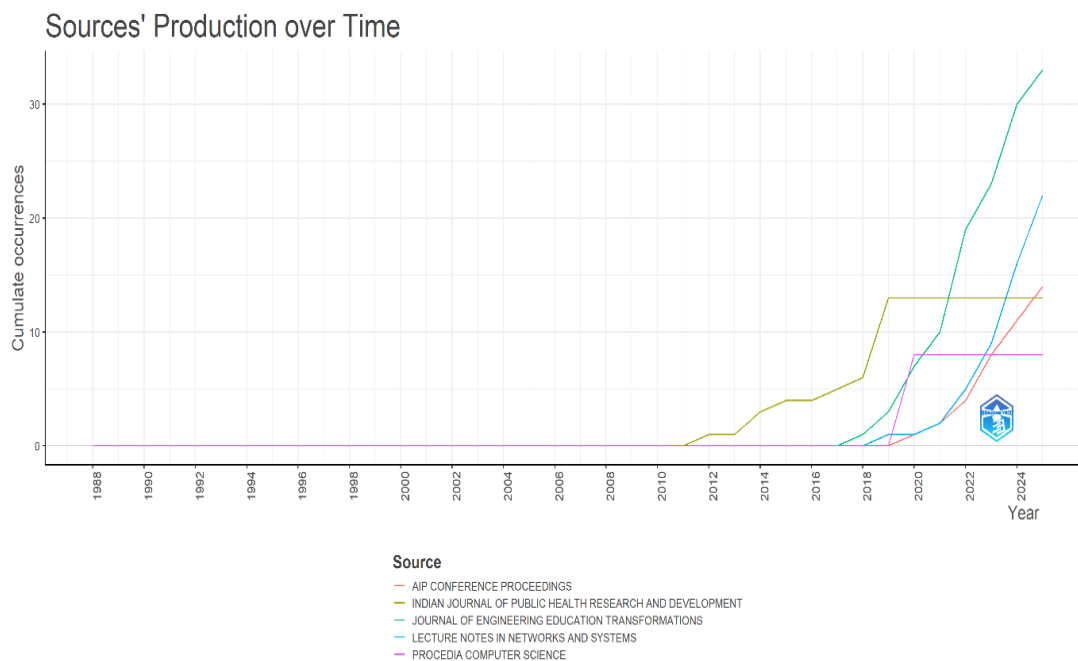


The research domain of life skills education for adolescents is a rapidly growing field marked by its Indian centrality and focus on technology-enhanced skill development. India acts as the dominant hub for global collaboration (as shown by the Co-authorship Map), maintaining the strongest

ties with the U.S. and the U.K., as well as partners like China and Singapore. The research themes are heavily concentrated on the intersection of "education," "life skills," and "technology". Specialized research streams emerge from this core, including adolescent e-learning/leadership, medical

education/simulation, and the integration of advanced technologies like AI, Virtual Reality, and machine learning into engineering and lifelong learning. This output is primarily channelled through

specialized publishing venues, specifically the Journal of Engineering Education Transformations and Lecture Notes in Networks and Systems, which are driving the field's exponential growth since 2018.



This set of visualizations clearly defines the research field as Indian-centric, rapidly growing, and intensely focused on technology-enhanced skill-based education within a framework of strong global collaboration. The Country Co-authorship Map highlights India as the single largest and most central hub, primarily collaborating with the United States and the United Kingdom.

Thematic analysis (Keyword Co-occurrence Map) reveals that the core research revolves around "education," "life skills," and "technology," which in turn drive specialized

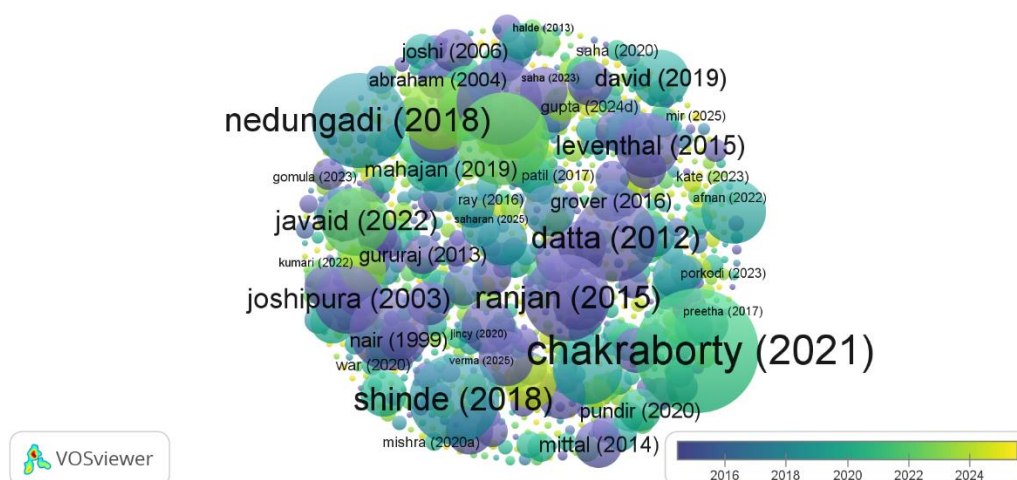
areas such as e-learning for adolescents, the integration of AI and Virtual Reality (VR) into lifelong learning, and dedicated research on medical education and simulation. This expansion is confirmed by the Sources' Production over Time chart, which shows an exponential growth in cumulative publications since approximately 2018, particularly in key venues like the *Journal of Engineering Education Transformations* and *Lecture Notes in Networks and Systems*, thus confirming the field's escalating relevance.

### Most relevant authors

Authors	Articles	Articles Fractionalized
SHINDE, SACHIN	5	0.80
BHADRA, SUBHASIS	4	3.50
DESAI, MURLI	4	4.00
DESAI, PADMASHREE D.	4	0.98
GURURAJ, GOPALKRISHNA	4	1.48
PANTHALOOKARAN, VARGHESE	4	4.00
PATEL, VIKRAM HARSHAD	4	0.42
THOMAS, JISHAMOL	4	1.67
ANAND, TANU	3	0.65
ARYA, KAVI	3	1.08

Selected	Author	Documents	Citations	Total link strength
✓	patel, vikram harshad	4	249	2
✓	shinde, sachin	5	222	2
✓	bhadra, subhasis	4	19	0
✓	desai, murli	4	0	0
✓	desai, padmashree d.	4	38	0
✓	gururaj, gopalkrishna	4	173	0
✓	panthaloorkan, varghese	4	21	0
✓	thomas, jishamol	4	4	0

### Citation on documents



The VOSviewer map of document citations essentially shows us the most influential papers—the bedrock upon which this whole research domain is built. The map makes it easy to spot the foundational giants: the largest circles belong to the publications by Nedungadi (2018) and Chakraborty (2021). Their large node size signifies they are the most cited works, confirming their massive

impact on the field's trajectory. We can also track the field's evolution: the map uses a colour spectrum (from purple to yellow). The appearance of yellow nodes indicates the most recent works, showing where the cutting edge is being established now. This visual roadmap confirms the field is actively building upon its powerful intellectual foundation.



focused on specific regional or thematic interests. In the world of academia, this strong international links payoff: they are typically a sign that the resulting co-authored publications will achieve a higher citation impact, amplifying the scientific reach of the work.

## DISCUSSION

This bibliometric analysis offers a broad overview of how research on life skills education (LSE) and adolescent well-being has evolved between 2015 and 2025. The steady rise in publications over the past decade suggests growing academic interest and stronger policy recognition of LSE as both a preventive and promotive approach to adolescent health. International frameworks, particularly those developed by the World Health Organization, continue to emphasize the importance of strengthening psychosocial competencies among young people to reduce risk behaviours and improve coping abilities (11,12).

The geographical distribution of publications shows that countries such as the United States, India, and the United Kingdom have made substantial contributions to this field. While this reflects research capacity and institutional support in these regions, the findings also reveal ongoing disparities in global collaboration. Earlier scientometric research has demonstrated that well-structured international research networks tend to enhance scientific productivity and citation impact (13). Expanding partnerships—especially with low- and middle-income countries—could improve contextual relevance and promote greater equity in LSE research.

The thematic analysis highlights mental health, resilience, and self-efficacy as core areas within the LSE literature. These findings are consistent with established behavioural theories that emphasize the role of perceived competence in influencing individual behaviour (14). In addition, strong meta-analytic evidence indicates that school-based social and emotional learning interventions lead to meaningful

improvements in psychosocial outcomes among adolescents (15).

More recently, the literature reflects a shift toward digital and technology-enabled approaches to life skills education. The COVID-19 pandemic significantly accelerated the adoption of online platforms and hybrid learning models, reshaping how life skills programs are delivered across educational settings (16). Bibliometric visualization tools have been instrumental in identifying these emerging thematic trends and mapping collaborative research patterns (12). At the same time, global education reports highlight the importance of inclusive and technology-supported systems to ensure quality education for all learners (17).

Empirical prevention research continues to demonstrate that structured life skills training programs are effective in reducing health-risk behaviours and strengthening communication, emotional regulation, and decision-making skills among adolescents (8). Systematic reviews further support these positive outcomes while pointing to the need for stronger long-term evaluation, better implementation fidelity, and greater cross-cultural adaptation (3). Although the research landscape is steadily expanding, sustained interdisciplinary collaboration and stronger global partnerships will be essential to advance the evidence base and practical application of life skills education worldwide.

## SUMMARY AND CONCLUSION

The decade from 2015 to 2025 represents a period of substantial growth and transformation in adolescent life skills education research. The field has progressed from primarily classroom-based approaches toward more integrated, interdisciplinary, and technology-enhanced models of skill development.

Theoretical foundations grounded in psychosocial and behavioral frameworks continue to guide intervention design, while digital innovation has expanded the scope and accessibility of life skills training. Strong contributions from leading research nations

have accelerated the field's development; however, broader international collaboration and contextual adaptation are still needed to ensure equitable global impact.

Overall, life skills education has emerged as a dynamic and forward-looking research domain. Sustained emphasis on longitudinal evaluation, culturally responsive programming, and scalable digital strategies will be critical to maintaining its relevance and effectiveness in addressing the complex challenges faced by adolescents in an evolving global landscape.

#### **Declaration by Authors**

**Ethical Approval:** Not applicable

**Acknowledgement:** None

**Source of Funding:** None

**Conflict of Interest:** The authors declare no conflict of interest

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How to cite this article: Rinu David, Dr. Molly John. Global trends and research patterns in life skills education for adolescents: a bibliometric analysis (2015-2025). *Gal Int J Health Sci Res*. 2026; 11(1): 149-162. DOI: <https://doi.org/10.52403/gijhsr.20260119>

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