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The effectiveness of community-based life skills education in preventing adolescent health risk behaviors: A systematic review

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Abstract

Background: The high prevalence of health risk behaviors among adolescents remains a major public health concern, leading to significant long-term consequences for individuals and society. Life skills education is recognized as an effective strategy to equip adolescents with the competencies required to make informed and healthy life decisions.

Objectives: This systematic review aimed to evaluate the effectiveness of community-based life skills education in preventing risky health behaviors among adolescents.

Methods: A systematic literature review was conducted in accordance with the 2020 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Comprehensive searches were performed in Scopus, PubMed, ProQuest, EBSCO, and Google Scholar using the keywords "adolescent," "teen," "youth," "health risk behaviors," "sexual behavior," "substance abuse," "Human Immunodeficiency Virus," "tobacco dependence," "youth empowerment," "life skills education," and "community," combined with the Boolean operators "AND" and "OR." Eligible studies included adolescents aged 10–24 years, community-based life skills interventions, and outcomes related to sexual behavior, substance abuse, and HIV/AIDS prevention. Randomized controlled trials, quasi-experimental, and observational studies published in English between 2014 and 2024 were included. Two independent reviewers assessed methodological quality using the JBI critical appraisal tool. Of 1,107 identified records, 17 studies met the inclusion criteria.

Results: Multicomponent interventions integrating life skills training, social empowerment, family support, and economic incentives were effective in improving knowledge, attitudes, and self-efficacy while reducing engagement in risky behaviors. Variations in outcomes were influenced by social context, implementation fidelity, and program design.

Conclusion: Community-based life skills education is an effective approach for promoting healthy behaviors and reducing risk among adolescents, although its impact may be limited in high-risk or socially disadvantaged groups.

Keywords: Adolescent health, Community-based intervention, Life skills, Health risk behaviors, Systematic review.

Introduction

Adolescence is a developmental stage characterized by profound physical, emotional, and social changes, marking the transition from childhood to adulthood.[1,2] The distinctive features of this phase -such as the desire for exploration, identity formation, and strong peer influence- render adolescents particularly vulnerable to engaging in risky behaviours.[1,3] Adolescent risky behaviors encompass actions or habits that can adversely affect the physical, mental, or social health of individuals in this age group, potentially leading to long-term negative consequences.[4,5] These include unsafe sexual activity, substance use (alcohol, tobacco, and illicit drugs), and violent conduct.[5]

Globally, the prevalence of risky behaviours among adolescents remains alarmingly high. According to surveys conducted by the U.S. Centers for Disease Control and Prevention (CDC) between 1991 and 2023,

approximately 31.6% of adolescents have engaged in sexual activity, 29.5% in substance abuse, 14.4% in smoking, and 11% have experienced or perpetrated sexual violence.[6] These data reflect a complex social phenomenon influenced by multiple factors, including peer pressure, cultural norms, limited access to reliable health information, and insufficient family and community oversight.[1,7]

Risky behaviours among adolescents have profound short- and long-term consequences on physical, mental, and social health.[8] Health risks such as unintended pregnancy, Human Immunodeficiency Virus (HIV) infection, sexually transmitted diseases (STDs), and substance abuse significantly endanger adolescents' well-being.[2,9] Each year, an estimated 21 million pregnancies occur among adolescent girls in low- and middle-income countries, with nearly 50% unintended, resulting in about 12 million births often linked to sexual abuse or unsafe sexual practices.[10] Moreover, these behaviours are associated with psychosocial problems such as anxiety, depression, low self-esteem, and heightened vulnerability to violence and delinquency.[11,12] Beyond individual harm, adolescent risk behaviours adversely affect families, schools, and communities, underscoring the need for comprehensive, evidence-based prevention strategies.[2,8]

Life skills education has been identified as a key preventive approach for reducing adolescent risk behaviours.[13–18] Life skills refer to adaptive, positive abilities that enable individuals to cope effectively with everyday challenges. They encompass cognitive, emotional, social, and behavioural competencies such as decision-making, critical thinking, emotional regulation, interpersonal communication, and resistance to peer pressure.[19] Evidence suggests that life skills education empowers adolescents to understand the consequences of their actions, improve self-regulation, and develop positive attitudes and values regarding health. Such interventions have proven effective in enhancing knowledge, skills, and attitudes related to sexual behaviour, substance use, HIV/AIDS prevention, and psychosocial well-being.[17,18,20]

Previous systematic reviews have primarily focused on school-based life skills interventions.[21–26] However, universal school programs often fail to reach adolescents who have dropped out of school or already display high-risk behaviours.[27,28] Older adolescents, in particular, tend to engage in independent, unsupervised activities, making school-based interventions less accessible.[29] Consequently, a significant portion of at-risk youth may remain excluded from conventional prevention programs.

In contrast, community-based educational interventions -including out-of-school and after-school activities- actively engage adolescents' social environments, such as families, schools, community leaders, religious figures, and local organisations, yielding notable improvements in adolescent health and quality of life.[27,30–32] Community-based approaches are participatory strategies that involve local stakeholders in designing, implementing, and evaluating health promotion programs to enhance collective well-being, including adolescent health.[33–35] These interventions are well-suited to adolescents' everyday contexts, increasing accessibility and relevance while promoting sustainable behavioural change.[27,35–37]

Nevertheless, despite substantial evidence supporting their benefits, findings remain mixed. Some reviews report inconsistent or limited effects of community-based programs in reducing risky behaviours, particularly among adolescents with high exposure to risk factors.[38–40] Furthermore, many studies are constrained by short-term evaluations or narrow population scopes, often overlooking the influence of diverse contextual variables.[32,41] Thus, further research is warranted to assess the long-term impacts of community-based life skills education on sustained behaviour change, its influence across multiple health domains, and the contextual determinants of program success. Such evidence is essential to guide the effective implementation of these interventions across diverse social settings.

Objectives

This systematic review aims to evaluate the effectiveness of community-based life skills education programs in preventing risky health behaviours among adolescents.

Methods

Study design

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and was registered with the International Prospective Register of Systematic Reviews (PROSPERO) (Record No. CRD420250656251).[42]

Search strategy

A comprehensive literature search was performed in Scopus, PubMed, ProQuest, EBSCO, and Google Scholar. Medical Subject Headings (MeSH) and PICO-based (Participants, Interventions, Comparison, and Outcomes) search terms were used to ensure precision and comprehensiveness. The keywords included: "adolescent," "teen," "youth," "risky behaviour," "health risky behaviours," "sexual behaviour," "substance abuse,"

"Human Immunodeficiency Virus," "tobacco dependence," "life skills training," "social competence," "personal skills," "youth empowerment," "skill development," "life skills education," and "community." Boolean operators "AND" and "OR" were applied to refine and combine search terms effectively.

An experienced health sciences librarian from the Faculty of Public Health, Universitas Indonesia, was consulted to develop the search strategy and identify relevant databases. The librarian, specialising in systematic searching and health information retrieval, conducted a Peer Review of Electronic Search Strategies (PRESS) to ensure the accuracy, completeness, and methodological rigor of the final search query.

Inclusion and exclusion criteria

The inclusion criteria for this review comprised studies involving adolescents aged 10–24 years who participated in community-based life skills education programs. Eligible studies focused on outcomes related to sexual behaviour, substance abuse, and HIV/AIDS transmission, and included randomised controlled trials (RCTs), quasi-experimental designs, and observational studies. Only full-text articles published in English between 2014 and 2024 were considered. Studies were excluded if they examined school-based life skills interventions; were review articles, qualitative studies, grey literature, book chapters, conference abstracts, or unpublished works; or if their primary outcomes were unrelated to risk behaviours, such as those focusing exclusively on nutrition, physical activity, crime, or general psychological outcomes.

Quality evaluation

Study quality was appraised using the Joanna Briggs Institute (JBI) critical appraisal tools, which were adapted to correspond with each study design. The JBI checklists included 13 items for RCTs, 9 for quasi-experimental studies, 11 for cohort studies, and 8 for cross-sectional studies.[43] Each "Yes" response was assigned a score of 1, while "No" responses received a score of 0. Based on total scores, studies were categorised as low quality (<50%), moderate quality (50–70%), or high quality (>70%).[43]

Data extraction

Two independent reviewers (FH and RD) extracted the data and assessed study quality to minimise selection bias. Discrepancies between reviewers were resolved through discussion or consultation with a third reviewer (DNH). Extracted data included: author, publication year, country, sample size and characteristics, study objectives, inclusion/exclusion criteria, study design, sampling method, intervention details, measured outcomes, and study quality.

Data analysis

Thematic content analysis was applied to identify recurrent patterns and central themes emerging from the included studies.[44] Codes were developed inductively based on study characteristics and intervention outcomes identified after full-text review. Data analysed included study features, intervention design and implementation, and the effectiveness of interventions. One reviewer (FH) verified the codes generated by the other reviewers (RDY and DN), and the team collaboratively categorised and refined the themes to align with the research objectives. Disagreements were resolved through discussion until consensus was achieved. The synthesised results were summarised and visually presented using Microsoft Excel.

Results

The literature search identified a total of 1,107 articles across the five selected databases. Duplicate records were screened using Rayyan (https://new.rayyan.ai), resulting in the removal of 49 duplicate entries. Title and abstract screening yielded 152 articles for further assessment, and after full-text evaluation, 17 studies met the inclusion criteria and were included in the final analysis. Figure-1 presents the PRISMA flow diagram, summarizing the article selection process.[42]

Following thematic content analysis, all identified themes, categories, and codes are presented in Table-1. The findings are reported systematically, describing the characteristics of the interventions and providing a comprehensive overview of the outcomes observed across the included studies [Table-2].

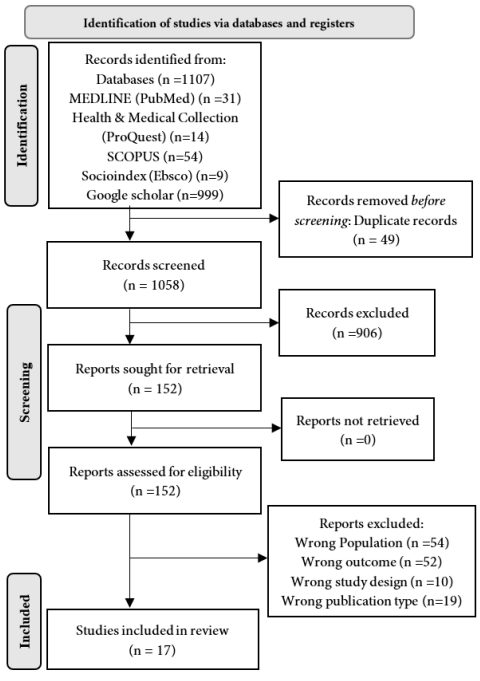

Figure-1. PRISMA Flow Chart.[42]

Table-1. Adolescent Interventions: Themes, Categories, and Implementation

No.	Theme	Category	Code
1	**Type of Intervention**	**Adolescent Girls Initiative-Kenya (AGI-K)** [45]	Implement a comprehensive multi-sectoral approach including 1) Violence Prevention; 2) Education Support; 3) Health and Life Skills (HLS) Education; 4) Financial Education.
		The Rites of Passage Program [59]	To find out how culturally tailored interventions can support the health and development of African American adolescent boys.
		The Mzake program [46]	Peer group intervention in improving HIV prevention knowledge.
		The Encuentro teen–parent program [60]	Promote healthy sexual decision-making and behaviour.
		BRAC's-ELA Model [47]	Life skills education, vocational training, and education on sexual and reproductive health.
		Kenya Adolescent Reproductive Health Project (KARHP) [48]	Empowerment on sexual health and addressing broader social challenges related to sexual education.
		Program Girl Empower [49]	Equipping adolescent girls with essential life skills and experiences in promoting the well-being of adolescent girls in Liberia.
		Prodigy Cultural Arts [36]	Supporting at-risk youth through cultural arts education and life skills development.
		COMPASS Program [50]	Life skills sessions are held weekly in a safe space, and adolescent girls can learn about communication, building friendships, and awareness about gender-based violence and reproductive health in refugee communities.
		Program 4-H Health Rocks! [58]	Development of personal and social skills that help adolescents make informed decisions about drug use.
		The SHAZ! Project [53]	1) Provide adequate and consistent access to HIV and sexual reproductive health services. 2) Life Skills Education 3) Economic Opportunities: micro-grants. 4) Social Support: integrated to improve adolescent well-being in Zimbabwe.
		Yo Puedo [56]	The program combines conditional cash transfers with life skills education to enhance education and reproductive health outcomes.
2	**Implementation of the Intervention**	**Length of intervention**	The shortest intervention was 2 months, and the longest was 42 months.
		Duration per session	A minimum of 45 minutes per session to a maximum of 3 hours per session.
		Number of sessions	The number of sessions ranges from 6 to 47.
		Form of intervention	1) Mentor-led group meetings. [47, 49, 50, 58] 2) Community dialogue. [45, 49, 53, 56] 3) Education by religious leaders. [48, 59] 4) Training. [46, 55, 60] 5) Guidance and counselling. [53] 6) Group dialogue, games, practice, and reflection. [52] 7) Family visits and media provision. [55, 60] 8) Lectures, simulations, role plays, video presentations, case studies, and testimonials. [54]

			9) Extracurricular activities: local folklore, including drama, theatre, and video performances, as well as debates, festivals, and essay competitions. [48] 10) Visits to historical sites, universities, [56] and cultural events. [50, 59, 60] 11) Free visual art classes and performances taught by local artists. [36] 12) Sports activities. [47] 13) An education program that incorporates micro-grants. [45, 49, 53, 56]
		Parties Involved	1) Youth, parent/guardian/caregiver, [49, 60] 2) Population Council, International Rescue Committee, and NGOs. [45, 49] 3) Health care providers. [46-49] 4) Religious figures. [48, 59] 5) Community leaders, teachers, and community volunteers, [49, 50] 6) Community and University partnerships. [59, 60]
3	**Effectiveness**	**Adolescent health risk behaviours**	1) Increase HIV prevention knowledge. [46, 48, 53] 2) Reducing risky sexual behaviour. [45, 47-49, 51, 53, 54, 56, 57] 3) Increase knowledge and awareness of reproductive and sexual health, including contraception, Sexually Transmitted Infections (STIs), and sexual debut. [45, 48, 56] 4) Attitude Change: disapproval of premarital sex increases. [48] 5) Approval of condom use is increasing. [48] 6) Decrease in sexual violence index. [48, 51] 7) Positive changes in gender attitudes. [49-51] 8) Improved access to health services. [47] 9) Improved attitudes and self-efficacy in preventing adolescent risk behaviour. [54, 56] 10) Decrease in early marriage. [49, 50] 11) Decrease in the rate of unwanted teenage pregnancies. [45, 51, 53] 12) Lower risk of engaging in transactional sex [51, 53] and are more likely to use condoms. [48, 53, 57] 13) Reduction of alcohol, drug, and illicit drug consumption behaviour. [52, 55, 56, 58]
		Reduce psychosocial problems	- Improved communication between adolescents and parents on topics of sexual health[51,60] and drug use prevention.[55, 58] - Lower chance of hanging out on the street frequently. [56] - Strengthening social networks. [49, 56] - Fewer teenagers get caught up in the law or go to jail. [56] - Increased protective factors of adolescent risk behaviour. [36, 52]
		Economic impact	- Improving financial literacy. [45, 49] - Reduced food insecurity and increased likelihood of having one's income. [53]
		Impact on education	Improving education continuation rates. [45, 46]

Location and setting

Of the 17 included studies, six programs (35%) were conducted in the Americas,[36,43–47] nine (53%) in Africa,[45–53] and two (12%) in Asia.[54,55] Regarding regional distribution, six interventions (35%) were implemented in rural settings,[46–49,54,56] seven (41%) in urban areas,[45,52,53,55,57–59] and four (24%) did not specify their setting.[36,50,51,60]

Programs were implemented across a variety of community facilities, including local community development offices, community organisations, town halls, and community meetings (76%),[45–49,51,53–57,59,60] youth clubs (18%),[47,56,58] residential or housing facilities (18%),[53,59,60] health centres (29%),[47,48,51,53,56] art classes (6%),[36] faith-based facilities (18%),[48,51,59] and refugee camps (6%).[50]

Age and gender of participants

Participant age groups varied across programs. Five studies (29%) targeted early adolescents aged 10–14 years,[36,45,58–60] four (24%) focused on middle adolescents aged 13–15 years,[36,49,52,59] another four (24%) included late adolescents aged 15–19 years,[50,53,54,56] and six programs (35%) encompassed adolescents aged 10–24 years.[46–48,51,55,57] Regarding gender, four interventions (24%) were directed exclusively at girls,[45,49,50,53] one (6%) targeted only boys,[59] and ten (59%) included both genders.[36,46–48,51,52,54,56–58]

Program facilitators

Program facilitation was carried out by diverse stakeholders. The majority involved community leaders and volunteers (59%),[46,49–51,53,56–59] followed by peer mentors or older youth (41%),[45,47,49,50,53,56,58] health professionals (35%),[46–49,51,52] and personnel from organisations such as the Population Council, International Rescue Committee, or other Non-Governmental Organization (NGOs) (24%).[45,47,49,58] Other facilitators included trained program staff (24%),[50,54,55,60] religious leaders (18%),[48,51,59] artists (6%),[36] family members with higher education (6%),[56] and representatives from community–university partnerships (12%).[59,60]

Form of intervention

The nature of the interventions varied considerably across studies. Seven programs (41%) were delivered through group meetings or mentor-led community dialogues,[45,47,49,50,53,56,58] while three (18%) were education-based programs facilitated by religious leaders.[48,51,59] Three additional programs (18%) focused on structured training sessions,[46,55,60] and one (6%) emphasised guidance and counselling.[53] Other formats included group discussions combined with games, practical exercises, and reflection (6%),[52] home visits and media-based education (12%),[55,60] and sessions employing case studies, lectures, simulations, role plays, and video presentations (6%).[54]

Several interventions incorporated extracurricular and cultural activities such as drama, debates, essay competitions, and festivals (6%),[48] as well as educational visits to historical sites and universities (24%).[50,59,60] One study offered free visual arts classes led by local artists (6%),[36] while another integrated sports activities (6%).[47] Four programs (24%) also included microgrant components to promote economic empowerment.[45,49,53,56]

Program duration

The duration of interventions ranged from 2 to 42 months. Five programs (29%) were conducted for less than six months,[36,51,52,58,60] seven (41%) lasted between six and twelve months,[47,49,50,54–56,59] and four (24%) extended beyond twelve months.[45,46,48,53] One study (6%) did not specify the duration.[57] The number of sessions per intervention ranged from six to forty-seven, with each session lasting between 45 minutes and 3 hours.

Study design and sample size

Eight studies (47%) employed a randomised controlled trial (RCT) design,[45,46,48–50,53,56,60] four (24%) used quasi-experimental designs,[36,52,54,55] four (24%) adopted longitudinal cohort approaches,[47,51,58,59] and one (6%) was cross-sectional.[57] Sample sizes varied substantially, ranging from 39 participants to over 85,000 in a large community-based RCT.[48] Data collection was conducted both before (60%)[36,46,47,51,54,56,58–60] and after intervention implementation (6%).[57]

Effects on sexual behaviour

Nine interventions (60%) demonstrated positive outcomes in reducing risky sexual behaviours among adolescents.[45,47–49,51,53,54,56,57] Improvements included increased knowledge and awareness of reproductive and sexual health (18%),[45,48,56] more critical attitudes toward premarital sex (6%),[48] higher approval of condom use (6%),[48] and reduced sexual violence (12%).[48,51] Positive gender attitude changes were reported in 18% of studies,[49–51] and several demonstrated increased utilisation of health services (6%),[47] greater self-efficacy in risk prevention (12%),[54,56] decreased rates of early marriage (12%),[49,50] and fewer unwanted teenage pregnancies (18%).[45,51,53] Additionally, reductions in transactional sex (12%)[51,53] and increased condom use (18%) were observed.[48,53,57]

Table-2. Intervention outcome characteristics

No.	Author, (Year) Country	Sample size & population	Intervention destination (Aim)	Study design	Measurement time	Sampling technique	Intervention procedure	Key results	Article quality
1	Ojonuba et al., (2023)[52] Nigeria	600 adolescents aged 12 to 17	Evaluating youth empowerment against drug use	Quasi-experiment	Baseline, 2-month, & 3-month follow-up	Cluster random	Freire's 3-phase model for substance use prevention	Reduced substance use, increased protective factors, decreased risk factors	JBI_2 9/9 High
2	Kumbani et al., (2023)[46] Malawi	A total of 1008 individuals, 460 adults and 548 adolescents (aged 13-19 years	Assessing peer-based community interventions (Mzake's) for HIV prevention knowledge	RCT	Pre and posttest	Sequential sampling	"Mzake": 15-month HIV prevention & life skills program using interactive methods	Mzake improves HIV prevention knowledge.	JBI_1 10/13 High
3	Christian C et al., (2023)[47] Uganda	42 adolescents (15-24 years old)	Assess feasibility of HIV education in youth clubs	Cohort	Pre- & 6-month post-intervention	Purposive	HIV prevention integrated into a 6-month youth program (ELA model)	BRAC's Empowerment and Livelihood for Adolescents (ELA) model, when integrated with HIV prevention efforts, enhances knowledge and reduces high-risk behaviours among adolescents.	JBI_3 9/11 High
4	Rapp-McCall et al., (2023)[36] Florida USA	61 Participants 10-15 years old	Evaluating life skills changes in a cultural arts program	Quasi experiment	Pre and post-test	Purposive	8-week life skills education via "Prodigy Arts" for at-risk youth, focusing on communication, problem-solving, and self-control.	Program improved life skills, reduced risks, but had little effect on self-esteem and empathy."	JBI_2 6/9 Medium

5	Kangwana et al., (2022)[45] Kenya	2075 adolescent girls aged 11-14 years	Impact of multisectoral programs on early sexual debut and fertility rates	RCT	Before intervention, 2 & 4 years after	Cluster random	2-year life skills & health education (violence prevention, gender norms, financial literacy)	Improved education, financial literacy, contraceptive knowledge, self-efficacy, and reduced birth rate	JBI_1 12/13 High
6	Shaluhiyah et al., (2021)[54] Indonesia	110 teenagers 15-19 years old	Impact of life skills on knowledge, attitudes, self-efficacy, and risky behaviour	quasi-experiment	Pre and posttest	Purposive	3-month intervention (6 hrs/week) using lectures, simulations, role-play, and case studies	Significant improvement in knowledge, attitude, and self-efficacy	JBI_2 8/9 High
7	Ozler (2019)[49] Liberia	1,216 girls aged 13 - 14 years and 1,132 caregivers	Evaluate impact across 7 domains (e.g., sexual violence, education, SRH, life skills)	RCT	Pre-, post-, & 24-month follow-up	Stratified random	"Girls Empower": 8-month life skills curriculum on health, leadership, safety, and financial literacy, led by female mentors.	Improved gender attitudes, life skills, SRH; no effect on sexual violence, education, well-being	JBI_1 12/13 High
8	Srikongphlee et al., (2018)[55] Thialand	969 youth aged 12-25 years	Assessing life skills training for preventing drug abuse	Quasi Experiment	Pre and posttest	Cluster random	6-month life skills program covering drug use risk factors, family visits, and media	Increased family cohesion reduces drug abuse risk.	JBI_2 8/9 High
9	Stark et al., (2018)[50] Ethiopia	919 teenagers aged 13-19	Effectiveness in reducing violence among adolescent girls in refugee camps	RCT	Pre-, post-, & 1-year follow-up	Cluster random	12-month life skills education on GBV, sexual health, communication, and friendship	No reduction in sexual assault; improved attitudes and social support; decreased child marriages	JBI_1 12/13 High

10	Karamagi et al., (2018)[51] Uganda	409 teenagers aged 10-24 years	Assessing the Quality Improvement for Behaviour Change (QBC) efficacy in reducing risky sexual behaviour	Cohort	Pre and posttest	Purposive	2-year life skills model: risk prevention, community improvement, HIV services	Reduced high-risk behaviours, violence, and teen pregnancy; increased support from parents and partners.	JBI_3 9/11 High
11	Sieving et al., (2017)[60] Minnesota	49 families, including 49 parents and 65 adolescents aged 11 to 14 years old	Evaluate culturally tailored sexual health programs in terms of their psychosocial and behavioural outcomes.	RCT	Pre and posttest	Cluster random	"Encuentro": 16-week program for Latino teens and parents	Improved parent-teen communication reduces adolescent sexual risk behaviours.	JBI_1 11/13 High
12	Njue et al., (2015)[48] Kenya	85,000 youth aged 10-19 years old	Evaluating multi-sectoral reproductive health programs for HIV prevention	RCT	Pre-, post-, & 18-month follow-up	Multistage random	Life skills intervention with community leaders, covering HIV, sexuality, and gender through extracurriculars	Improved SRH knowledge, attitudes on premarital sex and condom use; decreased sexual experience and nonconsensual sex.	JBI_1 12/13 High
13	Cooper et al., 2015[57] Midwestern, USA	1,452 Adolescents aged 12-18 years.	Explore community engagement and health risk behaviours	Cross-sectional study	One-time survey	Purposive	Data from five communities in a Pregnancy Prevention program, measuring community involvement, empowerment, risk behaviours, and demographics	Empowerment, reinforcement, and support mediate the link between community engagement and risk behaviours.	JBI_4 7/8 High

14	Okwumabua et al., (2014)[59] USA	39 adolescents, aged 8-16 years	Exploring effectiveness of culture-based programs	Cohort study	Pre and posttest	Purposive	"Unbroken Rites of Passage": 1-year life skills education integrating cultural, psychological, and community elements with religious leaders.	No significant outcome changes; shows potential for addressing disparities	JBI_3 8/11 High
15	Kumaran et al., (2014)[58] Florida USA	857 adolescents aged 10-15 years	Evaluate impact on drug knowledge, beliefs, and resistance skills	Cohort study	Pre and posttest	Purposive	"4-H Health Rocks!": The curriculum builds life skills, drug knowledge, and community awareness through fun activities	Increased knowledge, attitudes, and skills regarding drug resistance; improved communication between adolescents and adults, thereby reducing the risk of substance abuse.	JBI_3 8/9 High
16	Dunbar et al., (2014)[53] Zimbabwe	315 adolescent girls, aged 16-19	Evaluating combined interventions to reduce HIV risk	RCT	Pre-, post-, 18 & 24-month follow-up	Block sampling	24-month life skills intervention with reproductive health services	Decreased transactional sex, increased condom use, reduced unintended pregnancies	JBI_1 12/13 High
17	Minnis et al., (2014)[56] San Francisco	162 Youth aged 16 - 21 years	Evaluating feasibility of intervention combining cash transfers & life skills	RCT	Pre and posttest	Cluster random	"Yo Puedo": Sexual health life skills & 6-month conditional cash transfers	Increased positive sexual health behaviours and reduced alcohol consumption	JBI_1 11/13 High

JBI: Joanna Briggs Institution, JBI_1: JBI for RCT, JBI_2: JBI for quasi-experiment, JBI_3: JBI for the cohort study, JBI_4: JBI for cross-sectional study

Effects on drug abuse behaviour

Four studies (24%) reported significant reductions in alcohol, tobacco, and illicit drug use following community-based life skills interventions.[52,55,56,58]

Effects on HIV prevention

Four studies (24%) assessed outcomes related to HIV prevention. The *Mzake* program in Malawi improved participants' knowledge of HIV prevention strategies.[46] A program in Zimbabwe showed reduced transactional sex and increased condom use, key behaviours in HIV risk reduction.[53] An adolescent empowerment initiative in Uganda integrating HIV prevention education through club-based meetings enhanced knowledge of sexual health and decision-making skills.[47] Similarly, a large multisectoral RCT in rural Kenya demonstrated significant gains in reproductive and sexual health knowledge.[48]

Effects on psychosocial, educational, and economic outcomes

Four interventions (24%) reported improved communication between adolescents and parents regarding sexual health and drug use prevention.[51,55,58,60] Additional psychosocial benefits included reduced time spent on the streets (6%),[56] strengthened social networks (12%),[49,56] and lower rates of adolescent legal involvement (6%).[56] Some programs increased protective factors against risky behaviours (12%).[36,52]

Multidimensional interventions further yielded positive secondary outcomes such as enhanced financial literacy (12%),[45,49] reduced food insecurity and higher personal income (6%),[53] and improved educational attainment (12%).[45,46]

Discussion

This systematic review identified and analysed 17 studies that met the inclusion criteria, focusing on evaluating the effectiveness of community-based life skills education interventions in preventing high-risk behaviours among adolescents. The evidence consistently indicates that multidimensional interventions integrating life skills training, social empowerment, family support, and economic incentives are more effective in improving adolescents' knowledge, attitudes, and health behaviours than single-component approaches. Such integrated interventions produce more substantial and sustainable behavioural change. For example, the Girl *Empower* program in Liberia, which combines gender-transformative mentoring with conditional cash transfers, demonstrated significant improvements in life skills, gender attitudes, and reproductive health outcomes.[49] Similarly, the *4-H Health Rocks!* program in Florida, which merges life skills education with social support, significantly enhanced adolescents' knowledge and ability to resist substance use.[58] In Malawi, peer-group interventions facilitated by volunteers successfully improved HIV prevention knowledge and were replicable in low-resource rural settings.[46] These findings highlight the importance of addressing cognitive, social, familial, and structural factors simultaneously, consistent with the ecological model of health behaviour, which emphasises the interaction between individual capacities and environmental contexts.[61]

Although multidimensional approaches generally yield positive results, their effectiveness often depends on contextual factors and implementation fidelity. Dunbar et al., in Zimbabwe, for instance, reported that economic empowerment interventions combining life skills, vocational training, and microgrants had inconsistent effects on reducing HIV-related risk behaviours, suggesting that economic support alone is insufficient without psychosocial reinforcement.[53] Similarly, the COMPASS program implemented in Ethiopian refugee camps did not significantly reduce sexual violence exposure but effectively established safe spaces, strengthened social networks, and improved psychosocial well-being through culturally sensitive engagement.[50] These findings underline the necessity of tailoring interventions to local cultural norms and environmental conditions to enhance adolescent engagement and sustain behavioural change.

In Thailand, Srikongphlee et al., demonstrated that integrating life skills education with a family-based health promotion model significantly reduced tobacco and alcohol use among adolescents, largely due to strengthened family communication and emotional support.[55] Likewise, Njue et al., in Kenya found that community- and school-based reproductive health and HIV prevention programs involving parents and community mobilisation improved adolescents' knowledge and promoted safer sexual practices.[48] These studies reaffirm that active family and community participation creates supportive environments that reinforce the effects of individual-level interventions.

Findings from studies conducted across Africa (Uganda, Kenya, Nigeria, Ethiopia, Zimbabwe, and Liberia) and minority communities in North America further reveal that cultural values, social norms, and community structures critically influence program outcomes.[45,47–53,59] For example, the Rites *of Passage* program in African-

American communities was effective because it aligned with cultural identity and collective values.[59] Similarly, the *Encuentro* program in Latino communities integrated family participation and cultural traditions to strengthen intergenerational communication and promote healthy sexual decision-making, demonstrating high cultural congruence and effectiveness.[60] Cooper et al., also showed that among African-American adolescents, community involvement influenced risk behaviours indirectly through empowerment-related beliefs, underscoring the importance of culturally grounded empowerment in achieving behavioural change.[57]

Peer mentoring and participatory community engagement are pivotal components of successful interventions. Kumbani et al., found that peer-led groups in Malawi enhanced HIV prevention knowledge by leveraging social influence and community trust.[46] Similarly, Cooper et al., observed that community engagement programs foster adolescents' self-confidence and positive attitudes toward making healthy decisions, illustrating the broader benefits of participatory approaches.[57]

From a methodological perspective, most studies employed RCT or quasi-experimental designs with varying sample sizes and intervention durations ranging from six months to four years. Only a limited number included long-term follow-up assessments. For instance, Kangwana et al., implemented a four-year longitudinal design, offering stronger evidence compared with shorter pre–post studies lacking control groups.[45] Most studies utilised validated instruments to assess life skills, gender norms, reproductive health knowledge, and substance use behaviours, thereby improving reliability and comparability across studies. These evaluations generally addressed cognitive, behavioural, and psychosocial domains, reflecting the multidimensional nature of adolescent health. However, reliance on self-reported data in many studies introduces potential social desirability bias, and the limited use of objective or biological measures restricts external validity. Moreover, inadequate adjustment for confounding variables in some studies may have affected internal validity.

According to the JBI appraisal, most included studies were of moderate to high quality but exhibited methodological limitations, such as incomplete reporting of implementation processes, facilitator training, or contextual adaptations. Such omissions hinder replication and limit understanding of intervention mechanisms. For example, the *SHAZ!* program in Zimbabwe faced implementation challenges due to unstable political and social conditions, which were insufficiently reported.[53] Addressing these methodological gaps in future studies - through extended longitudinal designs, inclusion of objective outcome indicators, standardised reporting of implementation fidelity, and context-sensitive research frameworks- will enhance the robustness and applicability of evidence in adolescent health promotion.

This review also acknowledges several limitations inherent to the systematic review process itself. First, publication bias remains possible, as studies reporting positive outcomes are more likely to be published and retrieved. Second, despite an extensive search strategy, language and database restrictions may have excluded relevant non-English or non-indexed studies. Third, the absence of a formal evidence grading framework, such as GRADE, limits the ability to assess the strength and consistency of the evidence comprehensively. Finally, the cultural, geographical, and socio-economic diversity of the included studies constrains generalizability, as findings may not be equally applicable across all contexts. These limitations should be considered when interpreting the overall conclusions.

The synthesis of findings supports the relevance of empowerment theory and ecological systems perspectives as conceptual foundations for adolescent health interventions. By addressing multiple levels of influence - from individual skills to community structures- these frameworks facilitate the design of holistic and contextually adaptive programs that promote sustained improvements in adolescent well-being. Future research and practice should continue to integrate and refine these theoretical perspectives to strengthen the impact, scalability, and sustainability of interventions across diverse populations.

However, variations in outcomes across different contexts indicate that the success of programs relies not only on intervention design but also on the quality of implementation, cultural adaptation, and psychosocial support. Future research should prioritize: 1) longitudinal evaluations to assess the sustainability of behavioral changes; 2) the integration of life skills education with economic support mechanisms, such as cash transfers and entrepreneurship training, to strengthen outcomes in low-income settings; and 3) the participatory development of interventions in collaboration with local stakeholders to ensure cultural relevance, community ownership, and contextual fit. An adaptive, evidence-based, and culturally responsive approach will enhance the long-term effectiveness and sustainability of adolescent health interventions across diverse and high-risk environments.

Conclusion

This review demonstrates that multidimensional, community-based interventions integrating life skills education, social empowerment, family involvement, and economic incentives are more effective in promoting adolescent health than single-component approaches. Such interventions enhance individual competencies while addressing broader social and structural barriers, resulting in more durable behavioural improvements.

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Competing interests

The authors declare that they have no competing interests.

Abbreviations

HIV, Human Immunodeficiency Virus; STIs, Sexually Transmitted Infections; RCT, Randomised Controlled Trial; SRH, Sexual and Reproductive Health; JBI, Joanna Briggs Institute; GRADE, Grading of Recommendations, Assessment, Development, and Evaluations; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses; PROSPERO, International Prospective Register of Systematic Reviews; MeSH, Medical Subject Headings; PICO, Participants, Interventions, Comparison, and Outcomes; PRESS, Peer Review of Electronic Search Strategies; CDC, Centers for Disease Control and Prevention; NGO, Non-Governmental Organization; AGI-K: Adolescent Girls Initiative-Kenya; ELA: Empowerment and Livelihood for Adolescents; GBV: Gender-Based Violence.

Authors' contributions

Contributions to concept and design: FR, RD, SP; Data analysis and interpretation: FR, RD, and DNH; article draft: FR, RD, DNH, and article revision: FR, AK, MY, and SP. All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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Ethics approval and consent to participate

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Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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