



Review article

Interventions to Prevent Sexually Transmitted Infections, Including HIV, Among Young People in Low- and Middle-Income Countries: A Systematic Review of the Published and Gray Literature



Amanda M. Kalamar, Ph.D.^a, Angela M. Bayer, M.H.S., Ph.D.^{b,c}, and Michelle J. Hindin, M.H.S., Ph.D.^{a,d,*}

^a Department of Population Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland

^b David Geffen School of Medicine, University of California, Los Angeles, Los Angeles, California

^c Facultad de Salud Pública y Administración, Universidad Peruana Cayetano Heredia, Lima, Peru

^d Department of Reproductive Health and Research, World Health Organization, Geneva, Switzerland

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 A B S T R A C T

Sexually transmitted infections (STIs), including HIV, are prevalent among adolescents and can have lasting adverse health consequences. The objective of this review is to identify high-quality interventions and evaluations to decrease STI transmission and related risky behaviors among young people in low- and middle-income countries. PubMed, Embase, PsycInfo, Cinahl Plus, Popline, and the Cochrane Databases were searched without language limitations for articles published through November 2015. Gray literature was searched by hand. Reference tracing was utilized, as well as the unpacking of systematic reviews. Retained articles were those that were evaluated as having high-quality interventions and evaluations using standardized scoring. Twenty-one high-quality interventions and evaluations were abstracted. Three reported declines in STI diagnoses, three reported declines in STI symptoms, six showed declines in risky sexual behavior, seven reported increases in abstinence, 11 found increases in condom use, and five reported increases in health care utilization. There is a wide range of rigorously evaluated high-quality interventions included in this review that can inform researchers, donors, and policy makers about where to make strategic investments to decrease the spread of STIs, including HIV. With the recent advent of biomarkers, researchers can use a gold standard measure to assess intervention impact. The diversity of interventions can allow decision makers to tailor interventions to the context, age range, and gender of the target population.

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IMPLICATIONS AND CONTRIBUTION

This review finds 19 high-quality interventions and evaluations that reduce either sexually transmitted infections, including HIV, or related high-risk behaviors using a range of implementation strategies. The included studies can help inform strategic investments to reduce sexually transmitted infections across many contexts and among a diversity of populations.

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* Address correspondence to: Michelle J. Hindin, M.H.S., Ph.D., Johns Hopkins Bloomberg School of Public Health, Department of Population Family and Reproductive Health, 615 N. Wolfe Street, Baltimore, MD 21215.

E-mail address: mhindin@jhu.edu (M.J. Hindin).

Young people, ages 10–24, and in particular females and members of key populations, are disproportionately impacted by HIV and other sexually transmitted infections (STIs). In 2013, of the 35 million people living with HIV globally, 4 million were aged 15–24 [1]. Globally, 15% of women living with HIV were aged 15–24, of whom 80% live in sub-Saharan Africa, the hardest hit region by the epidemic [2]. There are approximately 380,000 new HIV infections among young women aged 15–24 every year, with 60% occurring in adolescent girls [2]. Herpes simplex virus type 2 (HSV-2) is one of the most common STIs globally [3], with the highest prevalence among 15- to 24-year olds found in sub-Saharan Africa followed by South Asia [3]. HSV-2 has been suggested as a marker for sexual activity to overcome the bias in self-reported sexual behavior, particularly for young people [4]. Young age is a major risk factor for certain STIs such as chlamydia, gonorrhea, and syphilis. For example, young age is the strongest predictor of chlamydia infection and prevalence of chlamydia is 3–4 times higher in females than in males [5]. These data underscore the importance of focusing on prevention of STIs among adolescents and young people and particularly females and key populations.

As was noted more than a decade ago, the majority of STIs occur in developing countries, and some of the key prevention and treatment strategies, including large-scale screening, face significant barriers [6]. Understanding relationship and partner characteristics [7,8] is essential for STI prevention. STIs acquired during adolescence and young adulthood can have lasting health consequences if undiagnosed or untreated. These consequences can include transmission to multiple partners [9], infertility [10], and pregnancy complications [10]. STIs are often asymptomatic, especially in males, who have few reasons to access health services, including STI screening. While a host of home-based [11] and point-of-care methods for screening are being developed [12], these methods are not widely available in low- and middle-income countries (LMICs). Prevention and treatment of STIs is challenging, as it most often requires both partners' involvement to reduce risky behavior (condom use and reduction of risky sexual practices), partner notification, and treatment to prevent reinfection. Overcoming these barriers is particularly acute for young people, who are often navigating complex relationships. Given the complexity of behavioral factors that contribute to STIs transmission, we systematically reviewed and evaluated interventions that were designed to reduce STI rates (primary outcome) and address the proximal behavioral outcomes of STI reduction strategies condom use, sexual activity, and health service utilization.¹ The objective of this systematic review is to identify high-quality interventions and evaluations to reduce STIs for young people in LMICs.

Methods

Search strategy

We undertook a systematic search of published literature to identify interventions that address STIs in LMICs. We used six databases—PubMed (MEDLINE), Embase, PsycInfo, Cinahl Plus, Popline, and the Cochrane Databases—in conducting these searches. Search strategies for each database used the particular

database's controlled vocabulary for searches (e.g., medical subject headings (Mesh) terms) as well as free text terms. In building the searches, we combined a list of terms that describe young people with a list of terms that describe STIs including HIV. We combined this search with a list of LMICs, as defined by the World Bank at the time of the search, and regional search terms. Details of the search strategy are described in the accompanying methodology commentary (Hindin and Kalamar, forthcoming).

We also hand searched the gray literature targeting organizations involved in STI prevention strategies (for a complete listing see Hindin and Kalamar, forthcoming). We searched the literature from 2000 to November 2015.

The results of the initial search of both published and gray literature were stored using EndNote (Thomson Reuters, Philadelphia, PA) reference manager software. All titles and abstracts resulting from the searches were screened for interventions related to STIs among 10- to 24-year olds in LMICs, and these remaining articles were abstracted.

Inclusion/exclusion criteria

Articles were included for abstraction if they met all the following criteria: (1) they report on STI interventions; (2) the intervention targeted young people, between ages 10 and 24; (3) the intervention was in an LMIC; (4) the article was written in English, French, Spanish, or Portuguese; and (5) the article was published from 2000 onward.

Abstraction ranking strategy

We created an abstracting and ranking template for all articles that met the inclusion criteria (available on request from the corresponding author). Each abstractor was given three sample articles, and the abstractions were reviewed for comparability. The abstraction template includes basic information on the design of the intervention and evaluation as well as a ranking of each. More detailed information is available from the methodology commentary (Hindin and Kalamar, forthcoming).

For each of the abstracted articles, the quality of both the intervention and the evaluation of the intervention's effects were assessed and rated on a scale from 1 (weak) to 5 (strong). To assess the strengths and weaknesses of the intervention, reviewers were asked to consider whether the intervention was grounded in theory, if the intervention was first pilot tested to assess feasibility and acceptability, whether and what kind of training personnel involved in the intervention received, what steps were taken to prevent crossover or contamination between intervention and control groups, the duration of the intervention, and whether and how randomization of the intervention and/or evaluation took place. A ranking of 1 or 2 was given when the weaknesses of the intervention and study design heavily outweighed any identified strengths. Articles were ranked as a 3 when, on balance, the study design had about as many strengths as weaknesses. Those that were ranked as the strongest, 4 or 5, had more identified strengths than weaknesses, and those assigned a 5 had few, if any, weaknesses.

To assess the strengths and weaknesses of the evaluation, reviewers were asked to consider several aspects of the evaluation design and evaluate the strengths and weaknesses before assigning a ranking score. These included the analytic techniques used to evaluate change attributable to the intervention, the use of an appropriate comparison group, sample size,

¹ Throughout this article, we include HIV as an STI, rather than a separate category.

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