BMJ Global Health

Gender-transformative HIV and SRHR programme approaches for adolescents and young people: a realist review to inform policy and programmes

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To cite: Gourlay A, Walker D, Singh S, *et al*. Gender-transformative HIV and SRHR programme approaches for adolescents and young people: a realist review to inform policy and programmes. *BMJ Glob Health* 2024;**9**:e014363. doi:10.1136/bmjgh-2023-014363

Handling editor Fi Godlee

► Additional supplemental material is published online only. To view, please visit the journal online (https://doi.org/10.1136/bmjgh-2023-014363).

Received 30 October 2023
Accepted 4 October 2024

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ABSTRACT

Introduction Gender inequalities continue to drive new HIV and sexually transmitted infections (STIs) at rates too high to achieve global goals. In high HIV-burden jurisdictions, this is particularly true for adolescent girls and young women at disproportionate risk, while social and systemic barriers also impede the engagement of young men and gender minorities with health services. We sought evidence of approaches to promote sexual and reproductive health (SRH) outcomes by addressing gender transformation and removing structural barriers that broadly limit prospects for adolescents and young people.

Methods We conducted a realist review to identify HIV and SRH-focused interventions with gender transformative mechanisms. Eligible interventions sought to achieve HIV/STI prevention, sexual behaviour or pregnancy outcomes among young people by enhancing agency, resources and social norms supportive of gender transformation. We developed a programme theory to guide the data extraction and synthesis and categorised interventions by strategy, recording impacts on health and/or gender-related outcomes.

Results We identified 33 eligible interventions, representing diverse programme strategies and outcomes. Most interventions used a combination approach, with economic strengthening as the most common central strategy (n=13), followed by community-based mobilisation for norms change (n=7), then school-based educational curricula (n=6). The majority (n=24) achieved 'dual effects', that is, positive effects on both health *and* gender-related outcomes; 15 with dual effects specific to HIV prevention. Few evaluations measured or found impacts on HIV/STI incidence. 12 reported positive impacts on condom use alongside improved agency or gender norms.

Conclusions Youth-focused interventions that address context-specific economic and social determinants of HIV and SRH risk have proliferated recently, with encouraging impacts on both HIV/SRH and gender-related outcomes. This bodes well for empowering strategies to achieve HIV and STI reduction targets among adolescents and young people, and broader SRH goals. However, most interventions prioritise individual rather than structural change; impeding their 'gender transformative' potential.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ A large body of literature points to the detrimental impacts of inequitable gender norms and other structural barriers on sexual and reproductive health (SRH) outcomes, including risk of HIV, sexually transmitted infections (STIs) and early pregnancies. A few reviews have sought to compile evidence for interventions that aim to address structural drivers—including gender inequalities—of HIV/STIs or poor SRH. These suggest largely mixed evidence of impact but often offer little insight into why promising interventions were, or were not, impactful. Previous reviews have also tended to focus on particular intervention types (eg, girls groups or economic interventions), were limited in geographical scope or did not specifically focus on adolescents or young people.

WHAT THIS STUDY ADDS

⇒ This study presents an expansive review of the literature on gender-transformative approaches to address HIV/SRH-related outcomes, among adolescents and young people. We assessed intervention impacts on *both* gender-related and SRH-related outcomes. By using a realist approach, the review elicits insights into how and why interventions were successful, offering lessons for adapting interventions to unique contexts.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Current approaches have not achieved the scale and depth required to right-course the prevention trajectory for young people at substantive risk of HIV and poor SRH outcomes. In a context of increasingly constrained resources, programme efforts will need to leverage broader, non-health investments to achieve the scale desired for global HIV prevention and SRH targets. These findings provide insights into potential options for national HIV and SRH efforts for adolescents and young people.

INTRODUCTION

Gains in adolescent and young people's sexual and reproductive health and rights (SRHR) over the past generation[1 2] have been encouraging. However, variable progress, within and

across countries, has highlighted the inextricable links between the underlying inequalities faced by adolescents and young people and their health outcomes. For instance, globally, between 2000 and 2023, birth rates decreased from 64.5 births per 1000 to 41.3 births per 1000 among girls ages 15–19 years.[3] However, improvements in meeting the need for contraception have been highest in countries with increases in gender equality and women's educational attainment,[4] and lowest in countries with high rates of child marriage.[1]

Meanwhile, declines in adolescent HIV incidence are evident but slower than hoped for, and not currently on track to achieve global goals.[5] In 2022, new infections among adolescent girls and young women aged 15–24 were almost five times higher than the 2025 target of less than 50 000 annually.[6] In a consistent feature of HIV and sexually transmitted infection (STI) epidemiology across high-burden and moderate-burden countries, adolescent girls and young women experience a disproportionate risk of HIV and STI acquisition relative to boys, young men and older populations.[7 8] Such disparities are driven by multiple intersecting vulnerabilities including pernicious gender dynamics and norms that can subject girls and young women to myriad-related unwanted outcomes. Simultaneously, socially prescribed expectations and systemic barriers also impede young men's engagement in healthcare, including HIV/STI testing (the gateway to prevention) and violence prevention.[5] Entrenched gender norms perpetuate stigma and inequalities that inhibit progress in improving HIV and SRHR outcomes for young people of all genders and sexual identities.[9–11] The COVID-19 pandemic exacerbated these challenges, setting back decades of progress across multiple domains of adolescent and young people's well-being.[12–14]

There is growing recognition that the global HIV response must also redress the underlying structural drivers such as poverty, gender inequality, race, violence and education, among others, due to the central role they play in impeding the delivery and uptake of programmes.[15 16] There have been increasing calls to address structural factors by applying a multilevel, multilayered combination approach that gives centrality to the values, preferences and needs of the intended audiences.[17] While the evidence is limited, there are indications of protective effects and influence on health outcomes, for instance, among adolescent girls and young women, even when these approaches have focused on individual and interpersonal change and, notably, have established their potential even within short project time frames.[18 19]

It is in this context that gender-transformative approaches gain saliency. Gender-transformative programming (defined as 'an approach focused on overcoming gender inequalities, removing structural barriers, such as unequal roles and rights and empowering disadvantaged populations')[20] can address the gender-based discrimination and vulnerabilities among adolescents and young people that inhibit the delivery, access and uptake of effective health information and services. Gender-transformative programmes are often multicomponent approaches that include elements aiming to address policies and systems while also promoting equitable gender norms, for example, through participatory and/or community-based approaches.

Despite stalls and setbacks in progress to date, countries and agencies remain committed to each of the Sustainable Development Goals (SDGs) on health and gender equality (SDG, 3.3 and 3.7, and SDG 5, respectively).[21] For instance, UN Women galvanised commitments worth an estimated value exceeding US$47 billion towards its 'Generation Equality' agenda as of December 2023.[22] As the global community recalibrates and intensifies strategies to achieve these targets,[17 23] we sought evidence of impactful actions to simultaneously achieve HIV/SRH and gender outcomes among adolescents and young people. Specifically, this review presents a synthesis of recent programme evidence on gender-transformative approaches to accelerate HIV and SRH outcomes among adolescents and young people.[24 25]

METHODS

Review approach

We conducted a realist review, guided by realist principles that aim to unpack not only what programmes work, but also how they work and through what mechanisms.[26] A realist review offers a model of research synthesis particularly useful for complex social interventions, considering their effects are highly dependent on context and implementation. The approach is also well suited to draw on diverse sources spanning qualitative and quantitative research evidence.[27 28] Central to the realist approach is the development of a 'programme theory', or a model that links programmes or intervention activities to outcomes via specific mechanisms.[26] The context in which the programme is implemented, for example, the geographic, cultural or epidemiological context, is also considered important in influencing this process.

The goal of this review was to iteratively refine a programme theory on gender-transformative approaches to addressing HIV and SRH among adolescents and young people through an evidence synthesis. We initiated the review by scoping the existing literature to identify interventions, specifically with a 'strategic search' of relevant research portfolios and pre-existing literature reviews (step A). This was supplemented by a systematic database search (step B) to update an existing review and ensure the collection of interventions was comprehensive.

Programme theory

Informed by the initial phase of the strategic search and discussion among the research team, we drafted a programme theory to reflect the overall intervention model envisioned.[26] Initially, this was defined as programmes that sought to achieve HIV or STI prevention, or improved pregnancy outcomes by enhancing

choice, agency, resources, social norms and institutions supportive of gender equality, operating through mechanisms such as person-centred, rights-based or empowerment approaches. The aim was to synthesise evidence across the programme theory, using this as an evaluative framework to help organise the data extraction and synthesis.[26] We populated the programme theory framework with the evidence found and refined it throughout the search and synthesis process.[28]

Step A: strategic search

In line with a realist approach, our strategic search was iterative and targeted, aiming to achieve good theoretical saturation with a reasonable breadth of sources.[28] While realist reviews aim to draw on a wide range of sources, including grey literature, there are far more potentially relevant sources than can realistically be covered. 'Saturation' here is akin to the concept in qualitative research, with the researchers asking themselves iteratively whether the new source is adding new knowledge, although Pawson *et al* concede that complete saturation is rarely reached within the constraints of project time and budget.[26] Some form of purposive sampling strategy is therefore also recommended.

We initially searched within research portfolios with relevance to gender-transformative approaches and HIV or STI prevention. For example, evaluations conducted of the DREAMS (Determined, Resilient, Empowered, AIDS-free, Mentored and Safe lives) Partnership, MTV (Music Television) Shuga and the Structural Drivers of HIV network (online supplemental file 1). Other previously identified reviews also served as a starting point. When relevant sources were identified, their reference lists were also searched.

Source selection and inclusion

We sought recent literature published within the last 5 years. Any source type was included in the strategic search, including original academic research, theses, policy and evidence briefs, published meeting notes, conference presentations, and reviews. We identified one particularly relevant systematic review by Levy *et al*,[18] focusing on gender transformative programming in infants to young adults for any health-related outcome, from which we selected studies focusing on HIV, STI and SRH-related outcomes in adolescents and young adults. We also updated this review with more recent publications (see section 'step B').

We applied predefined inclusion and exclusion criteria (online supplemental file 2).[26 29] In brief, eligible interventions that aligned with our programme theory, as described above. To be included in our review, outcomes related to HIV or STI prevention, sexual behaviours or pregnancy had to be reported, but not necessarily gender-related or empowerment-related outcomes. Given our focus on young people, we excluded studies that did not disaggregate results for the age groups of interest. Sources were included if eligible outcomes were reported across separate papers for the same intervention evaluation.

For the review by Levy *et al*,[18] we applied our own selection criteria to their list of included studies. Similarly, we applied our selection criteria to studies identified in a recent (2022) Masters degree thesis on gender-transformative programming for HIV prevention.[30]

Step B: systematic database search

We conducted a systematic database search using Web of Science, for articles that were published in English between 2 November 2018 and 1 December 2021 (to follow on from the review by Levy *et al*[18] which searched for articles published from January 2000 to 1 November 2018). Only original research articles and reviews were included in the systematic search. We modified the search terms published by Levy *et al* to narrow the focus to adolescents and young people and to specific HIV and SRH outcomes. The resulting terms encompassed young people, interventions, gender, social norms or power dynamics, HIV, STIs or pregnancies and were combined as shown in online supplemental file 3. We imported references into EndNote, deduplicated them and screened titles and abstracts using our predefined criteria in online supplemental file 2. For these resulting references, we reviewed the full text and again applied screening criteria to yield the final set of included articles.

Data extraction and synthesis

Our aim was to synthesise evidence across the programme theory's elements. We read, annotated and took notes from the included sources, populating an Excel spreadsheet (online supplemental file 4). Details of the intervention were collected, as well as any information on the mechanism and contextual factors. We documented HIV-related and SRH-related outcomes, for example, incidence of HIV, HSV-2 (Herpes Simplex Virus Type 2) or other STI, as well as pregnancy, other biomedical or SRH service-seeking behaviours and sexual behaviour, in addition to any outcomes related to gender transformation and empowerment (articles were not included if they collected only gender-related outcomes and none related to HIV or STI prevention). We made notes on the strength of evidence for quantitative study designs (measures of effect where given; impact or no impact), or summaries of qualitative evidence (descriptions of results by authors of those studies). For the subset of studies, we included from the Levy et al review,[18] we documented the findings as reported by the authors. We used the programme theory framework as a graphical tool to help summarise context, intervention, mechanism and outcomes of individual studies. Specifically, we conducted a 'deep dive' step in which we populated the draft programme theory with data and details of 10 interventions.

We reviewed and discussed the spreadsheet, populated programme theory frameworks and additional notes to synthesise the information collected. This process

included comparing and contrasting information, consolidating (bringing information together) and situating evidence in context; principles of the approach to a realist-style synthesis.[27] We grouped and tabulated interventions broadly by strategy, noting the evidence consistent with impacts attributable to the intervention on HIV/STI and SRH-related outcomes, and on gender- and empowerment-related outcomes. For literature reviews, we summarised key information in tables covering the scope of the review, main outcomes reported and brief conclusions made by the authors.

To identify the most promising strategies for simultaneously influencing HIV or SRH and gender outcomes, we identified interventions with evidence of dual positive effects on both outcome areas. Evidence of 'dual effects' included statistical results with a p value reported of <0.1 (so as not to discount slightly weaker statistical evidence of an effect); or a finding described as statistically strong or significant by a review author, where the p value was not reported; or where an author provided a description of qualitative evidence, ideally supported by quotes or examples. We further distinguished interventions that demonstrated positive effects on either a gold-standard metric (eg, HIV or STI incidence) or service utilisation (eg, pre-exposure prophylaxis (PrEP) uptake or condom use), in addition to a gender-related outcome, to identify the most promising gender-transformative approaches for HIV prevention specifically. We sought patterns among the interventions that did and did not achieve dual effects, in order to identify elements of successful programming and implementation pitfalls to avoid. We also sought to identify contextual factors that influenced programme implementation and outcomes.

To enhance the rigour of the review and aid the search, synthesis and interpretation of findings, we consulted experts working on HIV, SRH and gender transformation. Four discussion groups were held with (1) London School of Hygiene and Tropical Medicine (LSHTM) researchers; (2) Accelerate Hub researchers; (3) UNICEF technical advisors and (4) The Global Fund Adolescent Girls and Young Women partners. Participants were primarily identified through our professional networks, as well as through research centres, the identified research portfolios of interest and through author lists of included papers. We presented our search methods and emerging findings for feedback. Discussions in group 1 with LSHTM researchers were guided by activities and questions to deduce, for example, if key evidence was missing, to help with snowballing of sources and thoughts on programmatic implications. Discussions 2–4 aimed primarily to clarify and to inform interpretation of findings (eg, how and why interventions worked/did not work) and programmatic implications.

Patient and public involvement

Patients and/or the public were not involved in this study.

RESULTS

Flow of sources

Figure 1 details the flow of sources. The strategic searches in step A identified 11 reviews or summaries of evidence, primarily published since 2017 or in progress, including the review on gender-transformative programming by Levy *et al*.[18] The scope and brief conclusions of each review are summarised in online supplemental file 5. 18 studies were extracted from the Levy *et al* review. One further

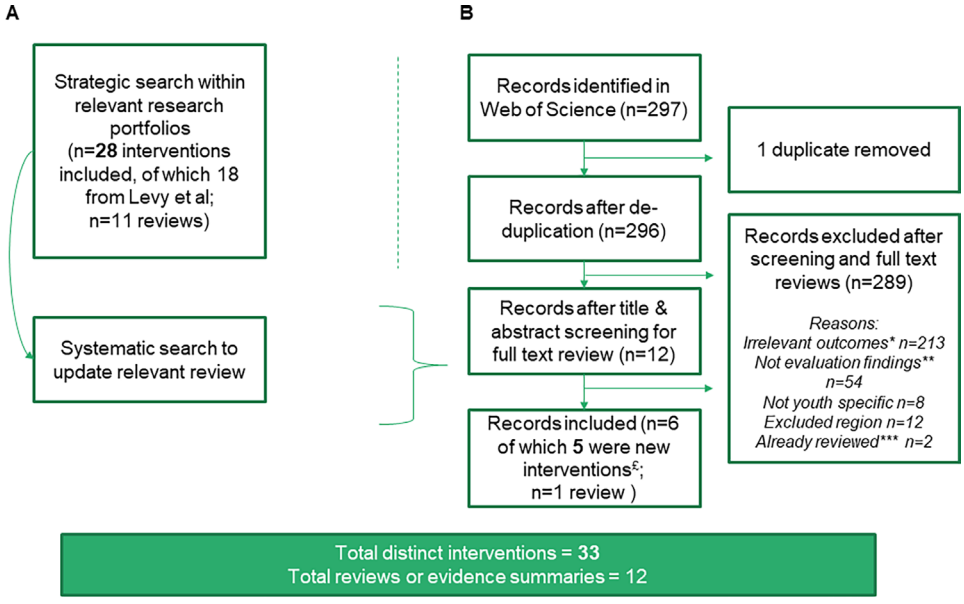

Figure 1 Flow diagram of sources. (A) Strategic search; (B) Systematic database search. *Includes articles also excluded for additional reasons, for example, lack of focus on youth; protocols/methodology papers. **Protocol, commentary and/or not evaluation of an intervention/programme. ***Already reviewed in the strategic search of portfolios or previously published reviews. £One article reported later results from a programme already identified in the original Levy *et al*'s[18] review.

eligible intervention evaluation (Zomba)[31] was identified from the review by Gafos *et al*.[32] Seven additional papers were identified by the Master's thesis on gender transformative programming[30] and were included, one of which presented later findings for an intervention already included (the Adolescent Girls Empowerment Programme (AGEP)).[33] Bodies of evidence for recent evaluations of DREAMS, MTV Shuga and the EMPOWER trial were also included from our research portfolios searches. In total, from the strategic search process, we included findings from 28 interventions/programmes, as well as evidence from 11 reviews or summaries.

For the systematic database search in step B, of 297 references retrieved, 12 papers were read in full after screening of titles and abstracts, of which 6 original research articles and 1 review article were finally included (figure 1). Of these, five were newly identified interventions, while one reported later results from a program[34] originally identified by Levy *et al*.[18]

Therefore, in total, we included 12 literature reviews along with 33 distinct interventions.

Summary of interventions included

Table 1 presents the 33 interventions identified, including details about the setting, target population and intervention approach (full details are shown in online supplemental file 6).

Settings

The eligible interventions were largely implemented in East and Southern Africa (n=24). Two interventions also included programming in this region, but extended far beyond, with DREAMS implemented in 15 countries[17 35 36] and MTV Shuga considered a global campaign[37] (details are in table 1). One intervention took place in West Africa (Liberia).[38] Three interventions were identified from Latin America—in Brazil, Mexico and Nicaragua[39–41]; two from India[42–44] and one from Vietnam.[45]

Target populations

14 of the 33 interventions targeted young women, while 3 targeted young men (Yaari Dosti in India[42]; Programme H in Brazil[39]; Male Norms Initiative in Ethiopia[46]), and the remaining 16 included both males and females. Many targeted young people in schools, while others sought to include those in school and out of school. Some interventions sought to reach 'vulnerable' young people, defined in terms of socioeconomic vulnerability (eg, orphanhood or household poverty) or sexual risk (eg, girls engaging in transactional sex for Women First).[47] DREAMS sought to reach females aged 10–24 years at the highest HIV risk, in high-burden HIV districts,[48–50] and in Zimbabwe sought intentionally to engage young women who sell sex (YWSS).[51] DREAMS also included young men, parents and communities through complementary, 'contextual-level' programming. Other interventions also targeted parents, guardians, and/or teachers, healthcare providers, and religious leaders. Apart from the one intervention aimed at YWSS,[51] none of the identified interventions sought to reach key populations for HIV prevention, such as self-identified sex workers, transgender young people, young men who have sex with men, those injecting drugs or prison populations.

Intervention models

The eligible interventions employed a wide range of strategic approaches to advance HIV/SRH programming through gender-transformative approaches (table 1, online supplemental file 6). 13 interventions—over one-third—included an economic empowerment component as its central strategy to reduce sexual risk, either alone, or in combination with a life skills training component, or with life skills and an additional component such as provision of health service vouchers (AGEP),[33 52] enhancements to linkages to SRH services, including violence prevention and adolescent-friendly services (Ujana Salama),[53] or social support and mentorship from trained staff (Shaping the Health of Adolescents in Zimbabwe (SHAZ)).[54] Economic strengthening components encompassed, for example, conditional and unconditional cash transfers, savings accounts, financial loans, establishing microfinance groups, financial and business skills training, and providing resources (eg, agricultural tools).

Seven interventions were community-based 'mobilisation' programmes primarily aiming to promote equitable gender norms (table 1, online supplemental file 6). They typically included educational sessions or workshops covering topics such as gender norms and power, human rights, violence, mental health, substance abuse, STIs including HIV, sexuality and relationships. The activities were often participatory through, for example, drama, role-play or critical reflection. Additional elements were social marketing campaigns, engagement with community leaders and groups, and training and capacity building, for example, to local non-governmental organisations. The three interventions targeting young men only were all community-based programmes.[39 42 46]

Six interventions encompassed school-based educational support or curricula, which usually addressed risky sexual behaviours and improved SRH through topics such as HIV and STIs, violence, gender power inequalities and supportive gender norms, sexuality, sexual debut and contraception. Some were delivered by trained teachers or peers, usually without other multilevel components, although a school health and violence safety service was included in PREPARE.[55] One intervention supported school attendance through provision of uniforms and school fees (School Support Trial).[56]

Two interventions, MTV Shuga[37 57–60] and Somos Diferentes Somos Iguales (SDSI),[41] were educational-entertainment campaigns based on television series addressing SRH, HIV and sexuality. They included complementary elements such as radio series, graphic novels, web sites, call-in radio shows or workshops to

Table 1 Description of interventions included in the review (n=33)

Intervention name, reference	Setting	Intervention category	Mechanisms/theory category (deduced if not stated by authors)	Programme participants
Adolescent Girls Empowerment Programme[33 52]	Zambia	Economic strengthening+life skills+other	Empowerment through agency and resources	Vulnerable girls aged 10–19
Adolescent Shamba Maisha[68]	Kenya	Economic strengthening	Empowerment through agency and resources	Females aged 13–19 and guardians
African Youth Alliance[65]	Uganda	Other (policy+adolescent-friendly services+behaviour change)	Socioecological model (individual and contextual factors influencing sexual/psychosocial development)	Girls and boys aged 10–24, teachers, parents, healthcare providers, social workers, religious leaders, media, politicians, policy-makers
AGI-K Intervention Package[91]	Kenya	Economic strengthening+life skills+other	Socioecological model	Girls aged 11–13
Community Mobilisation intervention[92]	South Africa	Community-based social/gender norms change approaches	Social norms change approach	Young men and women aged 18–35
Comprehensive sexuality education[40]	Mexico	School-based educational curricula (alone)	Empowerment through agency and resources; SRH rights-based approach	Boys and girls (students) aged 14–17
DREAMS[35 50 51 63 93 94]	15 countries in East and Southern Africa, Cote d-Ivoire, Haiti, Rwanda	Combination multilevel multicomponent package	Empowerment through agency and resources	Females aged 10–24; parents/caregivers; community members including boys and young men
EMPOWER[61 62]	Tanzania, South Africa	Combination biomedical intervention plus empowerment approach	Empowerment through agency and resources, social norms change approach	Females aged 16–24
Empowerment and Livelihood for Adolescents[34 95]	Uganda	Economic strengthening+life skills	Empowerment through agency and resources	Girls enrolled in school
Girl Empower[38]	Liberia	Economic strengthening+life skills+other	Empowerment through agency and resources	Girls aged 13–14
HPTN068[96 97]	South Africa	Economic strengthening (alone)	Empowerment through agency and resources	Girls aged 13–20 in school
Intervention Research[98]	South Africa	School-based educational curricula (alone)	Empowerment through agency and resources	Girls and boys aged 13–20 in school
Kenya Cash Transfer for OVC[71]	Kenya	Economic strengthening (alone)	Empowerment through agency and resources	Children, including orphans, <18 and their (very poor) households
Male norms initiative[46]	Ethiopia	Community-based social and gender norms change approaches	Social and gender norms change approach	Boys aged 15–24, NGOs, PMTCT providers
Mpondombili[99]	South Africa	School-based educational curricula (alone)	Social norms change approach; empowerment through agency and resources	Boys and girls aged 14–17 in school, teachers
MTV Shuga[57–60 100]	Global series in Kenya, Nigeria, South Africa, Cote d'Ivoire, Egypt, India, USA, and episodes free online	Media+	Social learning theory and person-centred HIV prevention	Target audience of young people aged 15–25
PRACHAR[43 44]	India	Community-based social and gender norms change approaches	Social and gender norms change approach	Girls and boys aged 15–19, guardians, young couples, influential community members, NGO staff
PREPARE[55]	South Africa	School-based educational curricula (+school health/safety service)	Empowerment through agency and resources; social and gender norms change approach; social cognition models	Girls and boys in high school

Continued

Table 1 Continued

Intervention name, reference	Setting	Intervention category	Mechanisms/theory category (deduced if not stated by authors)	Programme participants
Primary School Action for Better Health[70]	Kenya	School-based educational curricula (alone)	Empowerment through agency and resources	Girls and boys in school aged 11–16
Program H[39]	Brazil	Community-based social/gender norms change approaches	Social norms change approach; socioecological model	Boys aged 14–25, low income, in and out of school
SHAZ[54]	Zimbabwe	Economic strengthening+life skills+other	Empowerment through agency and resources	Girls aged 16–19, out of school, lost 1+ parent
School Support Trial[56]	Kenya	School attendance support	Empowerment through agency and resources	Girls and boys grade 7–8, orphans
Sista2Sista[101]	Zimbabwe	Community-based educational curricula+life skills	Empowerment through agency and resources	Girls aged 10–24, 'vulnerable'
SKILLZ Street[64]	South Africa (other Grassroot soccer programmes across SSA, Latin America, India)	Sport-based life skills	Empowerment through agency and resources	Adolescent girls in school grades 6 and 7 (age 11–16); females aged 18–26 in the community (coaches)
Somos diferentes somos iguales[41]	Nicaragua	Media+	Social norms change approach	Girls and boys aged 10–25
Stepping Stones[69]	South Africa	Community-based social/gender norms change approaches	Social norms change approach and empowerment through agency and resources	Girls and boys aged 15–26, community members, NGO staff
Tap and Reposition Youth[67]	Kenya, low-income and slum settings	Economic strengthening+life skills	Empowerment through agency and resources	Girls aged 16–22, out of school
Ujana Salama[53]	Tanzania	Economic strengthening+life skills+other	Empowerment through agency and resources—asset building	Girls and boys aged 14–19
UPLIFT[66]	Uganda, urban slums	Economic strengthening+life skills+other	SRH rights-based approach; Empowerment through agency and resources	Girls and boys aged 13–24
Women First[47]	Mozambique	Economic strengthening+life skills	Empowerment through agency and resources; socioecological interactions	Girls aged 13–19, including orphans, and with risk behaviours, for example, engaging in transactional sex
Yaari Dosti[42]	India, urban slums and rural	Community-based social/gender norms change approaches	Social norms change approach	Boys and men aged 15–24
Vietnamese Focus on Kids and Exploring the World of Adolescents (EWA)[45]	Vietnam	Other (SRH/gender education+adolescent-friendly services)	Socioecological model; social and gender norms change approach; protection motivation theory	Girls and boys aged 15–20. EWA+ also included parents, health providers
Zomba[31]	Malawi	Economic strengthening	Empowerment through agency and resources	Females aged 13–22

DREAMS, Determined, Resilient, Empowered, AIDS-free, Mentored and Safe lives; MTV, Music Television; NGOs, non-governmental organisations; OVC, Orphans and Vulnerable Children; PMTCT, Prevention of Mother-to-Child Transmission of HIV; SHAZ, Shaping the Health of Adolescents in Zimbabwe; SRH, sexual and reproductive health; UPLIFT, Urban Programme on Livelihoods and Income Fortification and Socio-civic Transformation.

discuss these or similar issues, or training of young leaders.

There were two examples of 'combination HIV prevention' interventions to address HIV risk and SRH through biomedical and social interventions. The EMPOWER trial provided an oral PrEP and SRH package, with screening and linkage to care for gender-based violence (GBV), plus empowerment clubs to provide PrEP adherence support.[61 62] DREAMS was a multilevel package covering a wide range of strategies across 11 intervention categories at the individual girl level and contextual level (parents, families, male partners and communities) (details are in online supplemental file 6).[48 49 63]

The remaining interventions were individual examples of a soccer-based life-skills intervention and supplementary text messaging service (SKILLZ Street),[64] training to provide adolescent-friendly services combined with SRH and gender education for young people and parents (Vietnamese Focus on Kids and Exploring the World of Adolescents),[45] or adolescent-friendly services combined with policy and advocacy elements and behaviour change communication (African Youth Alliance).[65]

Summary of evaluations reviewed

Table 2 presents the studies that published evaluation results for the eligible interventions. Many of the intervention evaluations used data from randomised controlled trials, otherwise observational quantitative evaluation data (eg, non-randomised comparisons between intervention and non-intervention groups accounting statistically for potential confounders), or mixed quantitative plus qualitative methods. Some studies (n=6) presented qualitative research only.

Programme outcomes assessed

A wide range of HIV, SRH and gender-related outcomes were assessed (online supplemental file 7). HIV or other STI incidence were assessed for seven interventions. Other biomedical outcomes included HIV testing and knowledge of HIV status, PrEP use and STI symptoms. Pregnancy/birth measures encompassed, for example, ever pregnant/gave birth, age at pregnancy/birth or pregnancies/births during study follow-up. Condom use or condomless sex, across different partner types and time periods, was reported in more than half of the included studies. Use of other contraception, number or type of sexual partners, engagement in transactional sex, outcomes related to sexual debut such as age at first sex, sexual activity and decisions around having sex were also assessed. Knowledge (eg, knowledge scores) and awareness of HIV/SRH/STIs were commonly reported. Self-efficacy around condom use or against unwanted sex, and communication around HIV/SRH with partners or others were occasionally reported.

Gender-related and empowerment-related outcomes assessed included generalised self-efficacy, social support, experience or perpetration of violence, ever-married or marriage aspirations, economic measures (such as the financial literacy scale, food insecurity, savings and income, or engagement in income-generating activities), and educational measures (such as school enrolment, attainment or drop-out). 'Gender equity' scales were used to score attitudes on gender equity or sexual relationship power. Communication with partners or others around gender or social issues was sometimes measured.

'What works': summarising the evidence of intervention effectiveness (outcomes)

Study outcome results are mapped in online supplemental file 8 with further detail in online supplemental file 9 for the most promising interventions (defined below).

Of the 33 interventions, 7 were evaluated in terms of their impact on HIV or other STI incidence. Of those, four measured HIV incidence with one (Zomba) demonstrating a positive impact (not Stepping Stones, HPTN068 or DREAMS). Seven measured STI incidence with three demonstrating positive results: Zomba (HSV-2); Stepping Stones (HSV-2) and MTV Shuga 'Naija' series in Nigeria (Chlamydia). The School Support Trial in Kenya showed borderline evidence of HSV-2 declines among males but increases among females. There was no statistical evidence of impact on HSV-2 incidence for three other interventions (HPTN068, SHAZ, DREAMS in KwaZulu-Natal).

For sexual and health-seeking behaviours and pregnancy, all but two (n=31) of the interventions demonstrated some positive results. The exceptions were Mpondombili and PREPARE—school-based curricula in South Africa—with no positive impacts on HIV/SRH-related outcomes, other than knowledge related. All interventions that were evaluated with measures of gender empowerment outcomes (n=31) demonstrated some positive results in this area. (No gender outcomes were included in two evaluations: Intervention Research in South Africa, or African Youth Alliance in Uganda.)

Of the 33 interventions, we classified almost three-quarters (n=24) as achieving 'dual effects' with positive effects on both HIV/SRH outcomes *and* gender-related outcomes (online supplemental file 8). This was the case for all of the economic strengthening interventions with the exception of Urban Programme on Livelihoods and Income Fortification and Socio-civic Transformation (UPLIFT) in Uganda, which demonstrated positive HIV-related benefits but unexpected adverse effects like increased misinformation about HIV risk and discrimination towards people living with HIV.[66] Similarly, almost all of the community-based approaches showed dual effects, with the exception being the Community Mobilisation Intervention (based on 'One Man Can') in South Africa, which showed sexual behaviour changes among females and gender-equity attitude changes among males, but not 'dual effects'.

Both of the media campaigns (MTV Shuga and SDSI) showed dual effects, as did DREAMS multilevel, multicomponent package of interventions. This was not the case for the EMPOWER trial, in which a package of PrEP plus SRH and GBV services was not more effective when empowerment clubs were included (however, PrEP uptake was high overall and participants cited many psychosocial benefits of the empowerment clubs).

Evidence of dual effects was mixed for school-based educational curricula. Programmes in Kenya and Mexico showed dual benefits, but not three different curricula in South Africa. The SKILLZ Street sports-based programme[64] did not demonstrate HIV/SRH benefits other than knowledge-related outcomes. The African Youth Alliance evaluation[65] did not measure gender-related outcomes, while the Vietnamese AFS (Adolescent Friendly Services)-based programme only measured SRH-related knowledge.[45]

We mapped the dual effects in a matrix (figures 2–3). When 'biomedical' HIV/SRH outcomes (such as HIV/STI incidence or testing, PrEP and other service use, figure 2) improve, they are most often combined with improvements in violence prevention (Stepping Stones, Ujana Salama, DREAMS with YWSS) or with positive changes in gender and social norms (MTV Shuga, SDSI, Programme H).

Table 2 Details of the evaluations reviewed

Intervention name	First author	Year	Setting	Evaluation study participants	Evaluation design
Adolescent Girls Empowerment Programme	Austrian *et al*[52]*	2016	Zambia	Vulnerable girls aged 10–19	Cluster randomised controlled trial (cRCT)
	Austrian *et al*[33]*	2020			
Adolescent Shamba Maisha	Onono *et al*[68]*	2021	Kenya	Females aged 13–19 and guardians	Qualitative IDIs nested within (separate) RCT
African Youth Alliance	Karim *et al*[65]*	2009	Uganda	Girls and boys aged 10–24, teachers, parents, healthcare providers, social workers, religious leaders, media, politicians, policy-makers	Non-randomised, postintervention ('post-test only') evaluation design. Self-reported exposure design; static group comparison design
AGI-K Intervention Package	Austrian *et al*[91]*	2022	Kenya	Girls aged 11–13	Cluster randomised trial
Community Mobilisation intervention	Pettifor *et al*[92]*	2018	South Africa	Young men and women aged 18–35	Cluster randomised trial
Comprehensive sexuality education	Makleff *et al*[40]*	2020	Mexico	Boys and girls (students) aged 14–17	Qualitative IDIs, case study trajectories, observations, FGDs, nested within longitudinal quantitative study
DREAMS	Gourlay *et al*[50]*	2022	Kenya, South Africa	Females aged 10–24; parents/ caregivers; community members including boys and young men	Observational cohort study
	Nelson *et al*[93]*	2021	Kenya		
	Floyd *et al*[63]*	2022	Kenya, South Africa		
	Birdthistle *et al*[35]*	2021	Kenya, South Africa, Zimbabwe		
	Mulwa *et al*[94]*	2021	Kenya		
	Chabata *et al*[51]*	2021	Zimbabwe	Young women who sell sex, aged 18–24	Cohorts in DREAMS vs non-DREAMS sites
	Mathur[102]*	2022	Kenya	Females aged 15–24	Cross-sectional survey with DREAMS beneficiaries
	Patel[103]*	2022	10 DREAMS countries†	Females aged 15–24	Analyses of PEPFAR monitoring data systems
	Saul[104]*	2022		Females attending antenatal care facilities	Spatiotemporal modelling analysis of PEPFAR data from antenatal care facilities
EMPOWER	Delany-Moretlwe *et al*[61]‡	2018	Tanzania, South Africa	Females aged 16–24	Longitudinal randomised intervention+qualitative
	Harvey *et al*[62]‡	2019			
Empowerment & Livelihood for Adolescents	Bandiera *et al*[95]‡	2012	Uganda	Girls enrolled in school	cRCT
	Bandiera *et al*[34]*	2020			
Girl Empower	Ozler *et al*[38]*	2020	Liberia	Girls aged 13–14	cRCT
HPTN068	Kilburn *et al*[96]*	2019	South Africa	Girls aged 13–20 in school	RCT
	Pettifor *et al*[97]*	2016			
Intervention Research	Visser[98]*	2007	South Africa	Girls and boys aged 13–20 in school	Quasi-experimental design with control group and pre–post assessment
Kenya Cash Transfer for OVC	Handa *et al*[71]*	2015	Kenya	Children, including orphans, <18 and their (very poor) households	cRCT
Male norms initiative	Pulerwitz *et al*[46]‡	2010	Ethiopia	Boys aged 15–24, NGOs, PMTCT providers	Quasi experimental study+qualitative IDIs at endline

Continued

Table 2 Continued

Intervention name	First author	Year	Setting	Evaluation study participants	Evaluation design
Mpondombili	Harrison *et al*[99]*	2016	South Africa	Boys and girls aged 14–17 in school, teachers	Quantitative pilot study; pre–post intervention surveys
MTV Shuga (Down South one campaign)	Kyegombe *et al*[60]*	2022	South Africa, KwaZulu-Natal	Males and females aged 15–30	Qualitative IDIs and FGDs
MTV Shuga (Down South two campaign)	Birdthistle *et al*[59]*	2022	South Africa, Eastern Cape	Males and females aged 15–25 years	Mixed-methods (web survey+IDIs and group interviews)
	Baker *et al*[58]*	2022		Young males and females and their parents	Qualitative IDIs and FGDs
MTV Shuga (COVID-19 mini-series)	Baker *et al*[57]*	2021	Multiple countries	Viewers, primarily adults <35 years and women	Qualitative. Extracts and synthesis of YouTube chats
MTV Shuga Naija	Bannerjee *et al*[100]‡	2019	Nigeria	18–25 year old males and females	Cluster randomised trial
PRACHAR	Daniel and Nanda[43]‡	2012	India	Girls and boys aged 15–19, guardians, young couples, influential community members, NGO staff	Cross-sectional survey 5 years postintervention implementation
PRAGYA (PRACHAR)	Pathfinder International[44]‡	2011	India	Girls and boys aged 12–24, guardians, young couples, influential community members, NGO staff	Retrospective data analysis of PRACHAR phases 1 and 2; qualitative FGDs
PREPARE	Mathews *et al*[55]*	2016	South Africa	Girls and boys in high school	cRCT
Primary School Action for Better Health	Maticka-Tyndale *et al*[70]*	2007	Kenya	Girls and boys in school aged 11–16	Quasi experimental quantitative; and qualitative FGDs. Preintervention/ postintervention design
Program H	Pulerwitz *et al*[39]‡	2006	Brazil	Boys aged 14–25, low income, in and out of school	Quasi experimental cohort design with preintervention/ postintervention surveys, plus qualitative interviews
SHAZ	Dunbar *et al*[54]*	2014	Zimbabwe	Girls aged 16–19, out of school, lost 1+ parent	RCT. Full combination intervention compared with LS+other health education components alone
School Support Trial	Cho *et al*[56]*	2019	Kenya	Girls and boys grade 7–8, orphans	RCT
Sista2Sista	Oberth *et al*[101]*	2021	Zimbabwe	Girls aged 10–24, 'vulnerable'	Randomised trial
SKILLZ Street	Merrill *et al*[64]*	2018	South Africa	Girls aged 10–14 in school and females aged 18–26 in the community	Pre–post survey, structured observation, SMS usage and attendance tracking. Qualitative IDIs and FGDs.
Somos diferentes somos iguales	Solorzano *et al*[41]‡	2008	Nicaragua	Girls and boys aged 10–25	Quantitative cohort study with surveys at three time points and qualitative FGDs and IDIs
Stepping Stones	Jewkes *et al*[69]*	2008	South Africa	Girls and boys aged 15–26, community members, NGO staff	cRCT
Stepping Stones and Creating Futures	Gibbs *et al*[78]*	2020	South Africa	Young women and men aged 18–30	cRCT
Tap and Reposition Youth	Erulkar and Chong[67]‡	2005	Kenya, low-income and slum settings	Girls aged 16–22, out of school	Longitudinal quantitative study with matched control group
Ujana Salama	Waidler *et al*[53]*	2022	Tanzania	Girls and boys aged 14–19	cRCT
UPLIFT	Renzaho *et al*[66]*	2022	Uganda, urban slums	Girls and boys aged 13–24	Cross sectional, two time points

Continued

Table 2 Continued

Intervention name	First author	Year	Setting	Evaluation study participants	Evaluation design
Women First	Burke *et al*[47]*	2019	Mozambique	Girls aged 13–19, including orphans, and with risk behaviours, for example, engaging in transactional sex	Longitudinal qualitative. IDIs, FGDs
Yaari Dosti	Verma *et al*[42]‡	2008	India, urban slums and rural	Boys and men aged 15–24	Quasi experimental cohort design
Vietnamese Focus on Kids & Exploring the World of Adolescents	Pham *et al*[45]*	2012	Vietnam	Girls and boys aged 15–20, parents, health providers	Cluster-randomised intervention design
Zomba	Baird *et al*[31]*	2012	Malawi	Females aged 13–22	cRCT, comparison group was no cash transfer

*Peer-reviewed literature.
†10 DREAMS countries: Eswatini, Kenya, Lesotho, Malawi, Mozambique, South Africa, Tanzania, Uganda, Zambia and Zimbabwe.
‡Online report.
cRCT, cluster randomised controlled trial; DREAMS, Determined, Resilient, Empowered, AIDS-free, Mentored and Safe lives; FGD, Focus Group Discussion; IDI, In-depth interview; NGOs, non-governmental organisations; SHAZ, Shaping the Health of Adolescents in Zimbabwe; UPLIFT, Urban Programme on Livelihoods and Income Fortification and Socio-civic Transformation.

For sexual behaviour outcomes (figure 3), the most common combination was improved condom use along with gender/social norms, for seven different interventions (AGEP; MTV Shuga; SDSI; School Support Trial among girls; all three male-specific community-based programmes). Condom use or condomless sex also improved together with personal agency measures, for five different interventions. In fewer cases, increased condom use was combined with improvements in early marriage, violence reduction, economic well-being and schooling. Among the gender-related outcomes, personal agency was the area most often improved alongside various sexual behaviour measures (six different interventions).

We identified 15 interventions with dual effects specific to HIV prevention among adolescents and young people

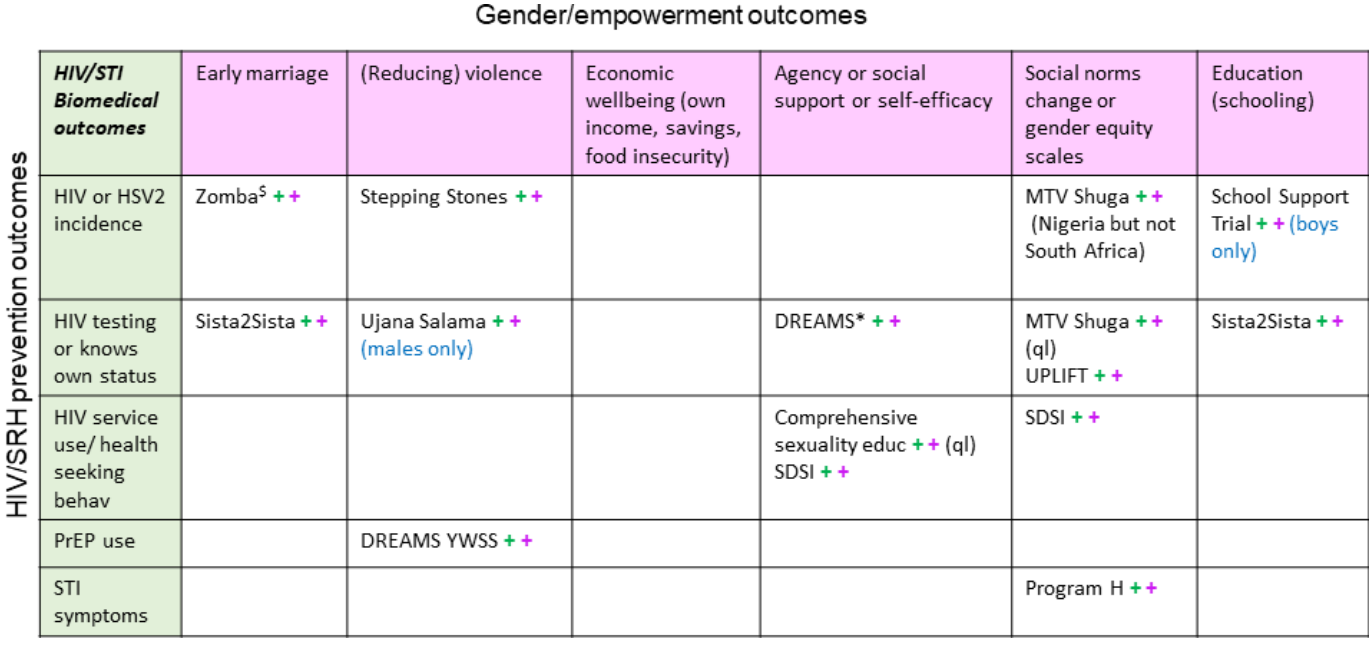

Figure 2 Mapping dual effect combinations of gender-related outcomes improving alongside HIV/STI biomedical outcomes. +Positive impact (pink indicates for gender-related outcomes, green for HIV/STI outcomes) (ql) qualitative evidence. *DREAMS: +indicates positive impacts in at least one setting; $Impact on early marriage only in subset of girls who had dropped out of school at baseline. DREAMS, Determined, Resilient, Empowered, AIDS-free, Mentored and Safe lives; MTV, Music Television; PrEP, pre-exposure prophylaxis; SRH, sexual and reproductive health; STI, sexually transmitted infection; UPLIFT, Urban Programme on Livelihoods and Income Fortification and Socio-civic Transformation.

Gender/empowerment outcomes

HIV/SRH prevention outcomes: *Sexual behaviours*	Early marriage	(Reducing) violence	Economic wellbeing (own income, savings, food insecurity)	Agency or social support or self-efficacy or person centred approach	Social norms change or gender equity scales	Education (schooling)
Condom use	Women First++ (ql) PRACHAR ++	Male Norms ++ Yaari Dosti ++	Women First++ (ql) TRY ++ AGEP ++	Primary School Action ++ SDSI ++ MTV Shuga ++	AGEP ++ Male Norms ++ Program H ++ Yaari Dosti ++ SDSI ++ MTV Shuga ++ (ql) School Support Trial ++ (girls only)	Women First++ (ql)
Condomless sex		DREAMS YWSS ++		A. Shamba Maisha ++ (ql) DREAMS Kenya ++		Adol. Shamba Maisha ++ (ql)
Number of sex partners		DREAMS YWSS ++ HPTN 068 ++			Community Mobilisation Int ++	
Age-disparate sex partner / partner selection	Zomba$ ++			Adol. Shamba Maisha ++ (ql)		Adol. Shamba Maisha ++ (ql)
Frequency of sexual activity	Zomba$ ++					
Sexual concurrency				MTV Shuga ++	MTV Shuga ++	
Transactional sex	Women First++ (ql)	Stepping Stones ++	Women First++ (ql)	Adol. Shamba Maisha ++ (ql)		A. S. Maisha ++ (ql) Women First++ (ql)
Sex unwillingly/ sex decisions			ELA ++	Comprehensive sexuality educ ++ (ql)	ELA ++	
Sexual debut		HPTN 068 ++		A. Shamba Maisha ++ (ql)		A. S. Maisha ++ (ql)
Pregnancy/ birth	KCT OVC ++ PRACHAR ++ Sista2Sista ++	SHAZ ++	SHAZ ++ AGI-K ++	MTV Shuga** ++	MTV Shuga** ++	PRACHAR ++ AGI-K ++ Sista2Sista ++

Figure 3 Mapping dual effect combinations of gender-related outcomes improving alongside sexual behaviour outcomes. +Positive impact (pink indicates for gender-related outcomes, green for HIV/STI outcomes) (ql) qualitative evidence. **MTV Shuga: pregnancy incidence impact in South Africa. $Impact on early marriage only in subset of girls who had dropped out of school at baseline in studies among men and women. Impacts shown here reflect an impact in either men or women. AGEP, Adolescent Girls Empowerment Programme; DREAMS, Determined, Resilient, Empowered, AIDS-free, Mentored and Safe lives; MTV, Music Television; OVC, Orphans and Vulnerable Children; SDSI, Somos Diferentes Somos Iguales; STI, sexually transmitted infection.

(online supplemental file 9). Five were economic strengthening interventions (two with life skills,[47 67] two without[31 68] and one with life skills plus other components[52]); five were community-based interventions (including all three male-specific programmes).[39 42 44 46 69] Both media interventions qualified,[41 59] as did the DREAMS multilevel package in different settings (eg, among young female populations in Kenya,[63] and YWSS in Zimbabwe),[51] and the School Support Trial.[56] In contrast, the school-based education interventions, and those building on AFS and sports-based life skills did not achieve dual effects specific to HIV prevention (apart from Primary School Action, Kenya).[70] Only one programme showed an improvement in PrEP uptake (DREAMS)[51] although few studies measured this.

Understanding why and how interventions work

Based on our review of the 33 interventions and 12 previous reviews, we sought characteristics of interventions achieving the strongest effects across HIV/SRH and gender measures. We first summarise lessons about context, implementation and mechanisms, then integrate these dimensions with a few examples, drawn from our 'deep dive' of interventions, to show how and why these interventions worked and for whom.

Reflecting context in planning and adaptation boosts success

Interventions that were designed to address local contextual drivers of HIV and SRH risk were among the more successful. Economic empowerment strategies, for example, were most likely to improve study outcomes when they addressed specific populations and local determinants of risk, whether that be household poverty,[53 71] the greater vulnerability of orphans[71] or low school completion.[31] Also, where young women sell sex for survival or resources, interventions like vocational training, employment, apprenticeships were welcomed by young women for economic strengthening, particularly in contexts of pervasive material deprivation.[51 72–74]

Combining implementation strategies for socioecological interactions

A 'combination' approach with multiple, integrated interventions is increasingly advocated for health and social issues with complex causal webs, such as adolescent HIV/SRH and gender equality, in order to achieve impacts at multiple levels, for example, individual-level (agency) and social-level (eg, social and gender norms in the wider community).[18 75] This review notes the growing proliferation of this approach. However, more intervention components did not necessarily yield better outcomes. How, and how well, such programmes are implemented influenced their impact.

Leadership by young people to optimise the delivery of interventions

Leadership by young people played an important role in programme effectiveness. Young people were trained to deliver interventions, offering a key resource in the integration of intervention components, for instance, helping adolescents to navigate multiple services. For example, peer-driven or 'network based' referrals were used successfully to reach and engage young women who sell sex in the DREAMS Zimbabwe programme.[51 73] Elsewhere, young people were recruited as 'mentors' to deliver interventions in the AGEP, TRY and DREAMS programmes. Mentors helped to facilitate curricula within safe spaces and to link participants to other interventions, integrating services in supportive and personalised ways.[76]

Mechanisms of impact

We sought the underlying theory or mechanism of change that each intervention used to create gender transformation or empowerment, but they were not always explicit (table 1). Some referenced a behaviour change theory without describing a gender dimension, and a few identified a theory of gender transformation or empowerment. These included a human rights-based approach to SRH, and a person-centred approach to reorient power dynamics around respecting individuals' personal choice and agency.

For interventions with 'dual effects', it was not always clear how the HIV/SRH and gender components of an intervention interacted to produce results. For example, it was not known whether a boost in personal agency led to increased condom use, in a direct pathway, as the studies reviewed did not present causal mediation analyses. Nonetheless, the following examples provide insights into potential mechanisms.

Enabling uptake of efficacious biomedical options through support strategies to boost agency

There are highly efficacious biomedical tools to prevent HIV/STI and pregnancy, including PrEP and postexposure prophylaxis, medical circumcision, condoms and contraception. Access to such biomedical tools can be empowering in itself, without additional supportive interventions like female support groups. For example, the EMPOWER trial in South Africa showed a high uptake of PrEP but no difference by trial arms with and without support groups. In other settings, however, provision of a resource must be combined with strategies to boost young people's agency to use it. This review identified different strategies to include social support and empowerment-centred interventions to help boost agency and uptake of health interventions. For example, the use of safe spaces to deliver HIV prevention packages to groups of adolescent girls and young women in private community-based venues was shown in Kenya (DREAMS) to increase female social support, social connectedness and self-efficacy,[50] as well as attitudes and knowledge related to gender and health.[76] As important elements of empowerment, it is plausible that enhanced social support, social connectedness and self-efficacy may have contributed to impacts on HIV/SRH outcomes, such as knowledge of HIV status and condomless sex (more so in rural Kenya) in the same DREAMS evaluation settings.[50 63] However, no formal testing of this pathway through mediation analysis was done, and evidence for a direct impact of safe spaces on health outcomes such as HIV incidence is sparse to date.

Edutainment supports person-centred approaches to positively influence HIV/SRH

This review showed that media interventions can play a positive, gender-transformative role in generating demand for HIV and other SRH services. The MTV Shuga campaign was shown to support a person-centred approach in which young audiences (both male and female) are made aware of HIV prevention options, through immersive, salient and realistic storylines. Internalising these messages and examples yielded positive effects on HIV and SRH outcomes (including increased HIV/STI testing, PrEP awareness, contraceptive use and declines in chlamydia), as well as on gender norms (eg, attitudes towards GBV).[37 59 77] Many of the benefits were experienced by both male and female audiences, showing the value of media in boosting male engagement in HIV/SRH.

Community-based interventions to tackle inequitable gender norms

This review showed the impact that community-based 'mobilisation' programmes can have on gender outcomes, including social norms and violence (attitudes, victimisation and perpetration) along with HIV/SRH outcomes, particularly among boys and men. Several improved beliefs and attitudes towards gender equality, reflecting success in working within their sociocultural context.

'Stepping Stones' and a later adaptation 'Stepping Stones and Creating Futures' are community-based HIV and violence prevention interventions that intentionally applied a gender-transformative approach.[69 78] Based in a context of poverty, in urban informal settlements in South Africa among out of school men and women, Stepping Stones and Creating Futures implemented participatory

group-based curricula, for example, covering GBV, HIV/STIs and motivations for sexual behaviour (the 'Stepping Stones' model), and (in the adaptation of 'Creating Futures') included group-based livelihoods curricula. The evaluation demonstrated some evidence for the development of more gender-equitable attitudes, likely driven by the participatory gender-focused curricula, and strong evidence for an improvement in women's earnings, potentially reflecting economic empowerment through the strengthening of livelihoods. These pathways may also have contributed to reductions demonstrated in violence perpetration among men, although among women, there was no evidence for a reduction in experience of partner violence. The study authors suggested this was most likely because the additional earnings were too small, in this context, for women to leave violent relationships.[69 78] The Stepping Stones trial further demonstrated impacts on SRH outcomes—reductions in transactional sex (men only) and HSV-2 (men and women; but not HIV).

DISCUSSION

The 33 interventions we identified from a strategic and systematic search of recent studies used a variety of intervention strategies to impact HIV, SRH and gender outcomes. Recent intervention strategies have moved beyond the premise that 'knowledge is power', and the past emphasis on information and education,[79] to also address contextual determinants of vulnerability, particularly economic, educational and social drivers of risk and inequality. Interventions are broadening beyond schools, to reach out of school, vulnerable young people in community-based settings, although few included gender-diverse groups or key populations at the highest risk of HIV. Schools remain a key venue for programming, often as an entry point for linkages with community-based components in combination programming.

Evaluations measured success against a wide range of HIV/SRH and gender-related measures. A minority assessed impact with biomarkers like HIV/STI incidence, most likely due to the challenge, time and costs of measuring new infections over time. Only one intervention demonstrated a reduction in HIV incidence, exposing scope to provide efficacious HIV prevention tools, for example, to offer PrEP in equitable and empowering ways (in the context of broader universal test and treat campaigns, to reduce untreated HIV prevalence and community viral loads).[80] Three interventions documented declines in more common STIs like HSV-2, modelling some effective ways to reduce young people's sexual risk.

The majority of interventions produced positive changes in other HIV/SRH outcomes together with gender-related measures, achieving 'dual effects', and showing that a range of options are available to achieve some HIV/SRH and gender impacts synergistically. There was particular promise for increasing condom use in combination with changes in personal agency or attitudes towards gender equity. The strongest evidence base emerged for interventions classified as 'economic strengthening', specifically to strengthen educational goals for young adolescents and economic empowerment for older adolescents and young adults.

'Community-based' mobilisation to change social and gender norms was particularly effective for males, with all three male-specific interventions demonstrating dual effects in a range of regions (South Asia, South America and Africa).[39 42 46] The interactive group-based nature of these interventions may have been effective in tackling entrenched gender and social norms by offering spaces for men to discuss these issues together. It is also notable that these interventions led to improvements for men themselves in their own sexual health.[39 46] This underscores the importance of gender-transformative programming that intentionally includes men, for their own benefit and as an integral part of strategies aiming for improvements in gender-related and HIV/SRH outcomes for girls and young women.

Despite the success of several community-based interventions in achieving improvements in gender-related outcomes and 'dual effects', influencing broader societal norms and structural change, for example, beyond the immediate participants or by changing institutional structures, was beyond the scope of most intervention strategies. Furthermore, evaluation measures typically measured individual rather than population-level change. This limitation has been noted in previous reviews (online supplemental file 5),[18 32 76 81] indicating that interventions continue to prioritise individual rather than structural change and this impedes their 'gender transformative' impacts.

Both of the multimedia edutainment interventions demonstrated dual effects across multiple measures, with positive impacts for both males and females aged 15–25. There is potential to expand the reach of dramatic series, for example, through streaming and social media platforms. The intensity of dramatic series may also be increased through offline peer-to-peer programming, community viewings, radio shows and facilitated discussions in schools and safe spaces. As an example, MTV Shuga was included in the DREAMS package in Kenya, reaching thousands of participants with viewings and discussions within safe spaces.

Our search terms yielded few facility-based interventions, indicating that gender equality and empowerment programming continue to be focused at the individual and interpersonal levels, thereby limiting the potential impact of such investments. Systems and institutions reflect and perpetuate the prevailing unequal gendered social norms and can serve as platforms for transformative change at scale.[82] These approaches could be embedded more often within adolescent health facilities (HIV/STI, family planning, antenatal, postnatal care services) or linked via strong clinic-community connections. Nonetheless, on the supply side, we did not find

'dual effects' for the interventions based on adolescent-friendly services, and judgemental services continue to hinder the potential of programmes that rely on linkages with public sector facilities. To overcome this, many programmes are adopting community-based models to reach adolescent girls and young women with services through mobile services, pop-up HIV testing sites, community activation events and the increasing provision of PrEP and HIV/STI services through community-based spaces.

While this review highlighted the proliferation of combination approaches, more components did not necessarily improve outcomes. Ensuring the quality, intensity and coordination of multiple components can be more challenging as more components are included. For the multicomponent DREAMS package, which achieved 'dual effects' for young women in Kenya and YWSS in Zimbabwe, delivery relied on a clear coordinating mechanism. In process evaluations of DREAMS across multiple settings, strong coordination was often attributed to a clear and committed lead organisation[36 83] and a role for community leadership. Lack of community engagement diminished programme acceptability, uptake and sustainability.[84] From the participant perspective, qualitative research showed that young people do not always have the time or means to participate in many different interventions or sessions[36] and resources must be committed to support young people's sustained engagement, for example, food, menstrual and personal hygiene packs, travel and childcare.

The implementation of the DREAMS package across many diverse settings also highlighted the key role of context, on both implementation and impact. A qualitative comparative analysis of DREAMS in diverse Kenyan contexts shows that delivering a similar core package of interventions required unique adaptations in each place. For example, to overcome geographical and infrastructural differences (wide distances and electricity gaps in rural settings or pervasive crime in urban slum areas); or to acknowledge conservative values and resistance to contraception and condom promotion in some communities; to address the severe hunger of participants in some districts; or to acknowledge the competing priorities of older participants with children, partners and financial needs.

Qualitative research has shown that empowerment of adolescent girls and young women can be threatening to male partners and parents in some contexts, with the risk of harm to female participants.[36] In such cases, working closely together with partners and families can be particularly important, to avoid a backlash and to strengthen collective agency and action. In most contexts evaluated, perceptions of DREAMS as 'girl-centred' led to claims of exclusion and unfairness among boys and young men, dampening community acceptance.[36 85] DREAMS was perceived to favour girls at the apparent neglect or exclusion of boys, despite the community and contextual programmes in the DREAMS package. We did not identify similar resistance with the male-centred programmes reviewed.

The value of leadership by young people in the implementation and effectiveness of interventions within this review suggests that programmes with empowerment as an endpoint must be empowering in their delivery, enabling the voice and choice of intended recipients. This review indicates that programming led by young people has evolved beyond the past popularity of 'peer education' models, with more professionalisation, training and responsibility.[86] Nonetheless, it is important that young leaders, such as mentors, are well supported. Qualitative evaluations indicate that the experience of mentors can be made safer and more positive, as many report stress, hardship, criticism, low pay and lack of recognition (financially or professionally) leading to low morale and high attrition.[76]

Other helpful frameworks exist, which could be used to operationalise gender transformative programming, but were not explicitly mentioned. For example, the 'multicultural feminist theory' delineates internal and external structures which keep women in subordinate positions, including cultural legacies, the global economy and histories of external domination like colonialism.[87] Also, in Kabeer's model of women's empowerment, expanded on by the Bill & Melinda Gates Foundation,[88] resources and agency are precursors to empowerment, enhanced by supportive institutional structures,[88 89] to achieve empowerment, which is manifest as choice, voice and power. Using this conceptual model, we found that most interventions aimed to provide resources (economic, educational, health services, bodily integrity) while also increasing agency (decision-making, collective action). Few changed institutional and systemic structures that perpetuate inequities, such as policies, cultural, traditional or social norms and relations at the societal level.

Implications for policy and practice

With galvanised investments[22] and a renewed commitment to accelerating efforts to achieve the global SDGs 3 and 5; this realist review spotlights implications for policy-makers, programme managers and adolescent and young advocates.

First, gender-transformative approaches are critical to achieving HIV and SRH outcomes for adolescents and young people, and these approaches can be implemented with sufficient scale and quality to achieve appreciable and measurable gains. Investing in and facilitating a gender-transformative approach to adolescent and young people's SRH/HIV programmes is essential to achieving sustained results.

Second, understanding and responding to the unique combination of contextual factors in play matters; policies and investments must consider and adapt the evidence of effective interventions to the local contexts and the target populations in order to achieve optimal impacts. Adaptation must go beyond superficial attributes (such as language) to address the deeper nuances that may

hinder or facilitate programming acceptability, feasibility and sustainability.

Quite importantly, less can be more. While multicomponent and multisector interventions undeniably have a role, streamlined and focused investments in proven effective policy instruments and intervention packages will benefit all, particularly if less cumbersome to administrate, and where these impose less burden on the young people, their families and the institutions that serve them.

There is a learning agenda to be robustly mounted, on how to programme and institutionalise investments to promote gender transformative *systems-change*. Building *learning systems* capable of reflexive introspection offers the opportunity to advance a critical front, given the potential for systems to reify harmful stereotypes, biases, pernicious power dynamics and oppressive structures. This is particularly critical for the health sector (given the scope of biased and disrespectful care reported by young people in the course of care navigation). This ambition should extend to other systems, including but not limited to Education, Social Services, Justice, Financial and other related interlinked systems.

It is incumbent on policy-makers and strategic stakeholders to emphasise an intersectional lens in applying a gender-transformative approach. This will enable a more nuanced response to the multiple, reinforcing deprivations that the most marginalised and vulnerable young people experience in their homes, institutions and communities.

Finally, a truly person-centred approach to gender-transformative care requires deep and meaningful partnership with adolescent and young advocates in all their diversities, and at all levels of the response: policy formulation, service delivery, design, advocacy, measurement and research. In light of the known risks inherent when young people engage with organised hierarchies and political structures, replicating extractive representation is no longer sufficient. Rather, it is critical to make adequate provisions for investing in leadership by young people, including supports to address considerations for safeguarding, mental wellness, just compensation, growth and development

Strengths and limitations

The key strength of this study was its depth, which went beyond aiming to understand *what* works, to unpacking *how* and *why* interventions work. It provides a consolidated synthesis that better helps us to understand actual combinations of interventions implemented at scale and their effectiveness.

Although we captured a broad range of academic and programme-based literature, we were limited to summarising published evaluations, yet many programmes and movements have been scaled up without investments in evaluating their impacts.

Evidence in this review came mostly from Eastern and Southern Africa. The interventions reviewed were those with evaluation data (in order to assess effectiveness), and there were no examples of intervention evaluations from the Caribbean, Eastern Europe or Central Asia, suggesting scope for further programming and research, although publication bias may be at play here. Including only English language publications may also have restricted the geographical distribution of the included studies, although this limitation is unlikely to have been substantial.

A further limitation was that it was not always clear what gender transformative mechanisms were embedded in the interventions reviewed, although we aimed to deduce from the available information.

CONCLUSIONS

Of the interventions we identified, the majority demonstrated some positive influences on both an HIV/SRH and a gender-related outcome, showing that important health goals can be achieved in ways that also address gender inequalities and empowerment. Such approaches can have lasting effects on the position and prospects of young people. A wide range of strategies were documented, with few interventions using the same approach. The few with a harmonised approach across settings, for example, DREAMS and MTV Shuga which were delivered and evaluated in diverse settings, showed different impacts in different places for different populations. Thus, we cannot conclude that there is one 'most impactful' intervention strategy to recommend. Instead, the variety of approaches can offer options. And that is valuable given the diversity of contexts and needs of young people. Important lessons have also been learnt to strengthen implementation and respect contextual differences, given the relevance of these for complex social interventions.[90]

As we embarked on this review, we set out a 'programme theory' to guide the data extraction and synthesis. We conclude by populating the programme theory, in online supplemental file 10, to synthesise the principles that emerged from this body of evidence. With careful planning and the flexibility to adapt along the way, and with strong coordination and leadership by young people, effective programmes are those which will reflect the context and local determinants of young people's HIV/SRH risk; offer efficacious HIV/STI prevention tools in combination with gender equity and empowerment strategies across multiple levels of the socioecological model (individual, community, structural); build on existing strengths, infrastructure and community groups and be guided by a theory of gender transformation or empowerment.

Acknowledgements We are grateful for the reviews and feedback of colleagues at UNICEF, UNAIDS, LSHTM and Partners of the Strategic Initiative for Adolescent Girls and Young Women coordinated by the Global Fund to Fight AIDS Tuberculosis and Malaria. Representatives of UNICEF Health and Gender teams: Anurita Bains, Tedbabe Degefie Hailegebriel, Ruth Graham Goulder, Maria Hyttel Storrusten, Maureen Kerubo Momanyi, Joanna Lai, Rikke Le Kirkegaard, Luwei Pearson, Oya Zeren Afsar. LSHTM colleagues: Venetia Baker, Helen Burchett, Ben Cislaghi, Aoife Doyle, Sian Floyd, Mitzy Gafos, Nour Horanieh, Nambusi Kyegombe, Shelley

Lees, Constancia Mavodza, Janet Seeley, Germaine Tuyisenge. We also appreciate the insights and ideas of Rachel Yates and Elona Toska (Oxford University and University of Cape Town). We recognise the contributions of Anna Williams (freelance editor).

Contributors DW, SS and IB conceived the paper. IB, AG and MM carried out the review: AG and MM conducted the searches, IB and AG synthesised findings and jointly drafted the paper, with input on analysis and interpretation from SS, DW and MM. SS and DW contributed to the Introduction and Discussion sections, and drafted the section on implications for policy and programming. IB and AG are responsible for the overall content as guarantors.

Funding This research was funded by UNICEF (PD/SSFA202135).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval There was no ethics approval sought, as it was a review of secondary data sources.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing is not applicable as no datasets generated and/or analysed for this study. All sources included in this review were freely available online, with the exception of one unpublished review in progress.

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