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Review article

Positive Youth Development Programs in Low- and Middle-Income Countries: A Conceptual Framework and Systematic Review of Efficacy

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A B S T R A C T

Purpose: Positive youth development (PYD) has served as a framework for youth programs in high-income countries since the 1990s and has demonstrated broad behavioral health and developmental benefits. PYD programs build skills, assets, and competencies; foster youth agency; build healthy relationships; strengthen the environment; and transform systems to prepare youth for successful adulthood. The goal of this article was to systematically review the impact of PYD programs in low- and middle-income countries (LMICs).
Methods: Targeted searches of knowledge repository Web sites and keyword searches of Scopus and PubMed identified over 21,500 articles and over 3,700 evaluation reports published between 1990 and mid-2016. Ninety-four PYD programs with evaluations in LMICs were identified, of which 35 had at least one experimental or rigorous quasi-experimental evaluation.
Results: Sixty percent of the 35 programs with rigorous evaluations demonstrated positive effects on behaviors, including substance use and risky sexual activity, and/or more distal developmental outcomes, such as employment and health indicators.

IMPLICATIONS AND CONTRIBUTION

The programs in this review provide emerging evidence that PYD interventions can be applied in very different contexts. The results include positive impacts across a range of outcomes (e.g., health, employment, and civic engagement) and may be promising for increasing gender equality. Although there is promise for the

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Conclusions: There is promising evidence that PYD programs can be effective in LMICs; however, more rigorous examination with long-term follow-up is required to establish if these programs offer benefits similar to those seen in higher income countries.

PYD approach [1], there is still much to be learned.

Positive youth development (PYD) broadly refers to childhood and adolescent developmental experiences that provide optimal preparation for the attainment of adult potential and well-being [2]. The extensive biological growth, social development, and emotional maturation that characterize this period in life [3] take place within a complex Web of physical and social environments that shape health, education, and developmental outcomes [4]. Programs that promote PYD (1) support young people to gain the assets and skills they need to thrive, (2) strengthen the environmental context to better support young peoples' development, and (3) build the agency of young people so that they may positively influence their own development and the environments in which they live.

The PYD approach was developed in response to the narrow focus on single problem behavior, often delinquency or substance use. Critiques of this approach recognized that "problem-free" does not mean fully prepared for a healthy adult life [5]. Developmental and prevention scientists as well as practitioners and policymakers reasoned that because many problem behaviors have common predictors, focusing on and measuring a single problem behavior may underestimate the impact of programs that alter these common antecedents [6].

In the early 2000s, progress was made in defining PYD constructs and in clarifying the essential components of a framework [1]. Efforts were made to identify and measure a comprehensive list of developmental assets [7–9]. As described in Table 1, a number of

Table 1
Evolution of PYD models and frameworks in the United States

Model	Description
Developmental assets profile (Benson et al., 1998) [7]	Focus on 40 developmental assets across eight broad areas of human development: • Support • Empowerment • Boundaries and expectations • Constructive use of time • Commitment to learning • Positive values • Social competencies • Positive identity
Five Cs model of PYD (Lerner, 2000, 2004) [2,76]	Focus on developmental assets Core constructs: • Competence: social, cognitive, behavioral, emotional, and moral • Confidence: self-efficacy, self-determination, belief in the future, and clear and positive identity • Connection: bonding • Character: prosocial norms, spirituality • Caring: empathy and sympathy for others
18 core constructs of PYD (Catalano, et al., 2002) [6]	• Social, emotional, behavioral, cognitive, and moral competencies • Clear and positive identity • Strength of character • Self-efficacy • Self-determination • Belief in the future • Positive emotions • Bonding • Positive norms • Opportunities for positive social involvement • Recognition for positive behavior • Spirituality • Resiliency • Life satisfaction
Key features of successful PYD programs from the National Research Council and the Institute of Medicine (Eccles and Gootman, 2002) [77]	• Opportunities for skill building and mastery • Supportive adult relationships • Engagement not only in community activities but also in program design, implementation, and evaluation • Clear expectations for behavior, as well as increasing opportunities to make decisions, participate in governance and rule-making, and take on leadership roles as one matures and gains more expertise • A sense of belonging and personal value • Opportunities to develop social values and norms • Opportunities to make a contribution to one's community and to develop a sense of mattering • Strong links among families, schools, and broader community resources • Physical and psychological safety

PYD = positive youth development.

similar approaches were published, each building on the previous work. In 2004, Catalano et al. [1] published the first systematic review of PYD programs in the United States and found 24 programs with significant improvements in positive development, including academic success and reductions in smoking, drug and alcohol use, school misbehavior, aggressive behavior, violence, truancy, school dropout rates, and high-risk sexual behavior. These programs seek to strengthen various PYD constructs [10] to increase positive outcomes and reduce behavioral health problems [11], emphasizing that all youth have strength, and with appropriate supports can become thriving adults.

Rigorous evaluations of PYD programs in high-income countries have demonstrated that such programs can help young people grow and develop in positive ways in both the short and long term. Areas of positive impact include reduced behavioral health problems, improved mental and physical health, economic development, and overall well-being of adolescents, their families, and their communities [6,12,13]. Investments in PYD translate to benefits for society by increasing young peoples' connections and contributions to civil society and through supporting successful transitions to adulthood.

This article investigates the impact of PYD programs in low- and middle-income countries (LMICs). Nearly 90% of the world's adolescents live in LMICs, where they experience greater early life adversities, reduced educational opportunities, and a heavier burden of disease during adolescence compared with youth in high-income countries [14]. Some approaches tested in high-income countries have been translated for use in LMICs, and the development of context-specific PYD approaches has also occurred [15–17]. For example, in Hong Kong, P.A.T.H.S. used a universal curriculum delivered by trained teachers and showed significant positive outcomes for youth reports using the Chinese PYD scale [18,19]. Cross-sectional studies in LMICs have found correlations between PYD constructs and better literacy, numeracy, and the availability of human, social, financial, and physical capital to generate income [11]. Youth with greater skills, stronger agency, and enabling environments are more likely to do well in school, be civically engaged, and value diversity [11]. These data provide some evidence that PYD intervention strategies work similarly in LMIC as they do in high-income countries and could effectively reduce some hardships for youth in LMICs. However, there has been no comprehensive review of the short- and long-term effects of PYD programs in LMICs, which recently have begun to be tested in experimental studies [20,21].

For the purposes of this review, a definition of PYD program characteristics was developed based on the literature [22], expert consultations, and key stakeholder surveys. PYD engages youth along with their families, communities, and/or governments so that youth are empowered to reach their full potential. PYD approaches build skills, assets, and competencies; foster youth agency; build healthy relationships; strengthen the environment; and transform systems [23,24].

The goal of this article was to assess the impact of PYD programs targeting youth aged 10–29 years in LMICs by systematically reviewing experimental and quasi-experimental evaluations in the literature [23]. The age range is intentionally wide to be inclusive of cultural variation in the transition from childhood to adulthood.

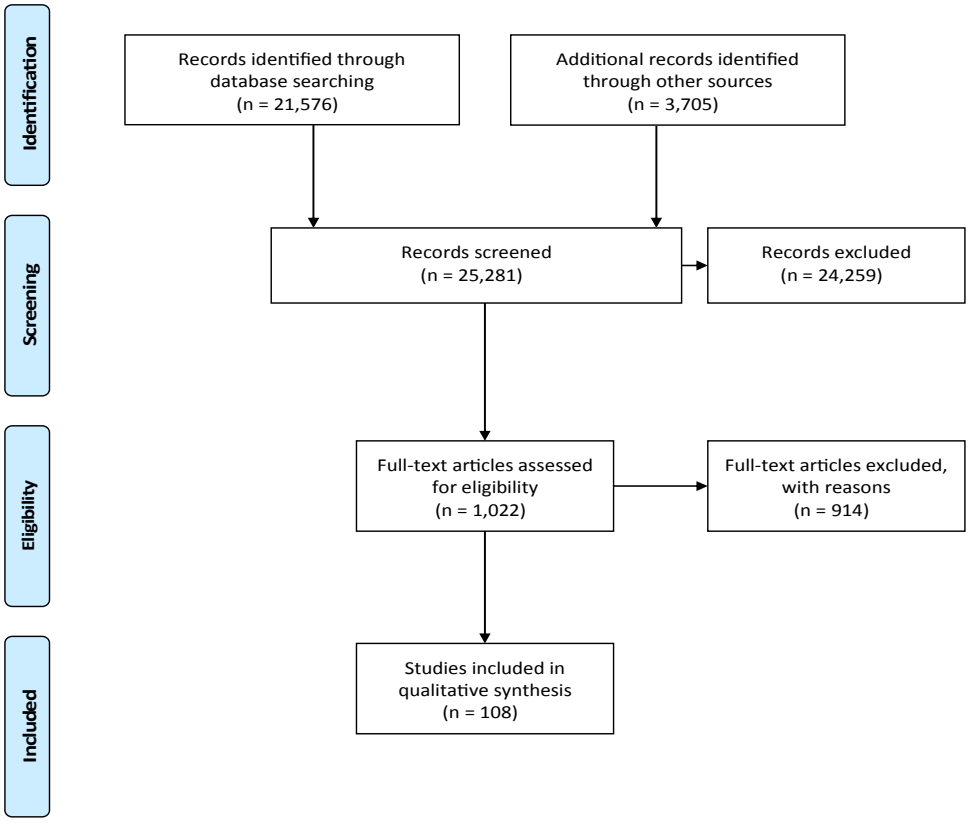

Figure 1. PRISMA diagram of document identification and screening.

Table 2
PYD constructs organized by domain

Construct	Definition
Domain: Assets	
Education/training	Exposure to formal education or training.
Interpersonal skills (social, cognitive, and communication skills)	The range of skills used to communicate and interact with others, including communication (verbal, nonverbal, and listening), assertiveness, conflict resolution, and negotiation strategies. These are skills that help to integrate feelings, thinking, and actions to achieve specific social and interpersonal goals. Cognitive skills are those used in academics or in decision-making and problem-solving.
Recognizing emotions and self-control	The ability to identify and respond positively to feelings and emotional reactions in oneself and others. The ability to delay gratification, control impulses, direct and focus attention, manage emotions, and regulate one's own behaviors.
Domain: Agency	
Positive identity	Positive and coherent attitudes, beliefs, and values that one holds about oneself and one's future.
Self-efficacy	Belief in one's abilities to apply skills in real-life situations.
Ability to plan ahead/goal setting	The motivation and ability to make plans and take action toward meeting a personal goal.
Perseverance (diligence)	The capacity to sustain both effort and interest in long-term projects regardless of perceived or real difficulties. Perseverance is the act of continual attempts to achieve goals despite difficulties.
Positive beliefs about the future	Having hope and optimism about one's future potential, goals, options, choices, or plans.
Domain: Contribution	
Youth engagement with civil society	Youth participate fully in democratic and development processes, play active roles in peace-building and civil society, and are less involved in youth gangs, criminal networks, and insurgent organizations
Youth engagement with adults	Meaningful youth engagement is an inclusive, intentional, mutually respectful partnership between youth and adults with active participation by youth.
Domain: Enabling environment	
Bonding	The emotional attachment and commitment or investment made to social relationships in the family, peer group, school, or community.
Opportunities for prosocial involvement	Opportunities for positive interactions and participation in family, peer groups, school, or community.
Support	The perception that one is cared for and supported by family, peer group, school, or community.
Prosocial norms	Youth hold healthy beliefs and clear standards for positive behavior and prosocial engagement.
Value and recognition	Youth believe that they are of value in society and that their positive contributions are recognized and rewarded. This may be demonstrated through youth-friendly services, policies, and laws.
Gender responsive	This element allows youth-identified gender issues to guide services, creating through every stage of programming (site selection, staff selection, program development, content, and material), an understanding of how gender affects the realities of young people's lives.
Physical and psychological safety	Youth feel safe in their immediate environment. Physical environment is free from violence, conflict, and crime. Youth feel free to express their ideas, thoughts, and feelings in their environment.

PYD = positive youth development.

Methods

Search strategy

This review included peer-reviewed studies and gray literature reports (see Figure 1). To identify studies in the peer-reviewed literature, the research team selected search terms and tested combinations of these using Scopus and PubMed to identify peer-reviewed studies with evaluations of PYD programs in LMICs. The search terms were tested by seeing if they captured 10 seminal PYD evaluation articles that had been identified by a team of experts [23]. Over 21,500 peer-review articles were identified through this keyword search. For the gray literature, targeted searches of knowledge repository Web sites hosted by international agencies, including the U.K. Department for International Development, the United Nations, the Inter-American Development Bank, and the World Bank, were supplemented with a survey of more than 450 donors and program implementers in LMICs such as Save the Children and United Nations International Children's Emergency Fund. This search process identified more than 3,700 relevant reports, which were then screened in three increasingly in-depth review processes based on title, abstract, and full text.

The criteria for inclusion were that studies had to (1) be published between 1990 and mid-2016; (2) be written in English, Spanish, or French; (3) include an evaluation in an LMIC; and (4) target youth between 10 and 29 years of age. In addition, to be included, a program had to address more than one PYD construct or address one PYD construct across multiple socialization domains (e.g., home, school, and peers). To this end, a list of relevant PYD constructs was assembled based on an integration of constructs, core concepts [10], the six Cs [2], and previous literature reviews. These constructs were then placed into one of four domains: assets, agency, contribution, and enabling environments (see Table 2). It was not required that program implementers or evaluators identify the program as PYD or measure the PYD constructs they intended to impact.

After title and abstract screening, the full text of 1,022 articles and reports was screened. Sixty-one published articles and 44 reports were included in the final review. These 105 studies reported on 94 different programs. Relevant variables such as program name, country, implementer, target population, program objectives and types of activities, PYD-targeted constructs, research design, quality of statistical analyses, and outcomes were coded. An additional person reviewed 10% of the titles during the title and abstract screening processes to check for consistency in inclusion/exclusion decisions. Percent agreement ranged from 95% to 97%.

Assessing rigor of evaluation

Of the 94 programs identified, 35 had at least one evaluation using a rigorous experimental or quasi-experimental design. Assessment of rigor was conducted using an adapted version of the Checklist for Blueprint Program Evaluation Criteria [25]. Evaluations were considered rigorous if they met at least six of the following eight criteria: the study (1) used an experimental design; (2) used intent-to-treat analysis; (3) demonstrated that attrition was below 5% or unrelated to group assignment, sociodemographic characteristics, and baseline measures of the outcomes; (4) the sample was clearly described; (5) the reliability or validity of tests and measures was described; (6) the analysis was done at the proper level; (7) the analysis controlled for baseline outcome measures; and (8) demonstrated baseline equivalence between conditions. Readers interested in promising but less rigorously evaluated PYD programs in LMICs can access more information on those programs in the full report [23].

Presentation of results

Results are organized with reference to the PYD logic model depicted in Figure 2. For most programs, the ultimate goal is to improve one or more specific positive youth outcomes, such as education, employment, or health. Our logic model illustrates that to impact their ultimate goals, programs address PYD constructs across the four domains (assets, agency, contribution, and enabling environment), which in turn lead to changes in the proximal PYD mediators.

These changes are often in norms or in the skills of youth and/or the adults around them. Changes in PYD mediators are then hypothesized to lead to behavior change, such as reduced substance use or increased service utilization. These behavior changes are expected to result in a range of positive outcomes for youth and their communities (i.e., physical health and employment). The logic model was used to organize the presentation of results, rather than to be strictly interpreted as a mediation model because mediation was almost never tested formally in program evaluations.

Results

Table 3 provides summary information on the 35 programs identified with rigorous experimental or quasi-experimental tests of intervention effects. One program (Yo, Pienso, Siento, y Actuo [19]) is included in Table 3 because it was evaluated in a randomized trial, but the school-based mental health curriculum reported no significant effects and is not discussed further. Based on the conceptual model in Figure 2, first, we describe results of efficacy trials in which the significant positive effects are on PYD mediators only. For instance, an evaluation may have demonstrated increased self-efficacy and positive attitudes toward condom use but did not ask about actual condom use after the intervention. Second, we describe programs that demonstrated behavior change (i.e., actual condom use). In some cases, these programs also had measured effects on PYD mediators. Finally, we present results for programs that demonstrated effects on positive youth outcomes. In some cases, there is also evidence of effects on PYD mediators and behaviors.

PYD mediators

Ten programs demonstrated effects on PYD mediators only. All these programs were evaluated within 12 months of

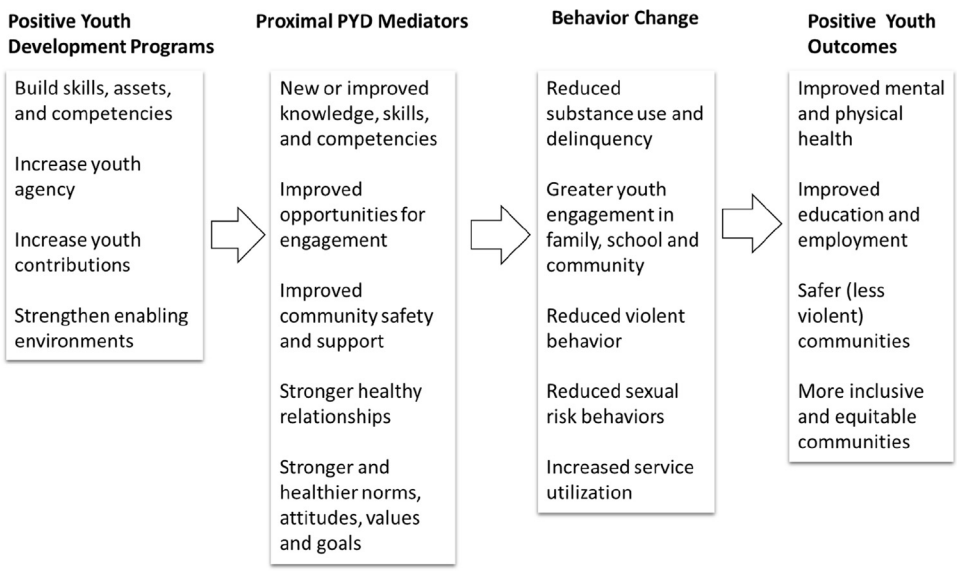

Figure 2. Logic model of PYD program impact.

Table 3
Positive youth development (PYD) programs in low- and middle-income countries with experimental or rigorous quasi-experimental evaluations

Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
Child Resilience Psychosocial Structured Activities program											
Ager et al., 2011 [26]	Quasi-experimental	PYD	Uganda	7- to 12-y-olds	School	8 schools	Tx = 203 C = 200	15 structured 1-h sessions delivered in school by trained teachers and periodic meetings with parents and research and agency staff	Increased child- and parent-reported child well-being: social competence, academic engagement, respectful, open/honest, happy and healthy	12 mo	None reported
Life Skills Training for suicide prevention											
Jegannathan et al., 2014 [27]	RCT	Mental health	Cambodia	Secondary school	School	2 schools	Tx = 168 C = 131	Weekly 90-min participatory sessions with discussions, activities, and home assignments	Boys with high-risk behavior improved on relationship, purpose in life, and life skills Girls improved relationships, health maintenance, and life skills	6 mo	No effects on mental health overall or for low-risk men or any women Some life skill dimensions not effected
Violence prevention											
Ekhtiari et al., 2012 [28]	RCT	Violence prevention Gender equality	Iran	High school	School	10 schools	Tx = 255 C = 255	Life skills training specific to domestic violence with focus groups for girls, training for school counselors in prevention and facilitating parent involvement	Reduced favorable attitudes toward domestic violence Improved violence preventive behaviors, communication strategies related to domestic violence among girls	2 mo	None reported
Girls First											
Leventhal et al., 2015 [29]	RCT	Mental health	India	11- to 15-y-old girls in rural area	School	69 schools	Controls = 706 Girls First Resilience = 1,681	Weekly group soft skills training, work in groups to design and implement projects for peace in their own lives and those around them	Improved emotional resilience, self-efficacy, social-emotional assets, psychological well-being, and social well-being	5 mo	No impact on depression or anxiety
The Life Skills and HIV/AIDS Education Program											
James et al., 2006 [30]	RCT	SRH/HIV	South Africa	12- to 21-y-olds	Schools	22 schools	Tx = 513 C = 628	20 weekly lessons delivered by teachers in health education classes	Improved HIV knowledge	6, 10 mo	No effects on condom use, sexual activity, or attitudes
Focus on Kids (adapted) school-based, peer-led HIV/AIDS prevention for children of migrant workers											
Li et al., 2010 [31]	RCT	SRH/HIV	China	13- to 15-y-old children of migrant workers	School	12 schools	Tx = 1,140 C = 1,097	Eight 90-min sessions delivered by trained medical students	Increased SRH knowledge, attitude, and self-efficacy	3 mo	None reported

Table 3
Continued

Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
The Vietnamese Focus on Kids											
Kaljee et al., 2005 [32]	RCT	SRH/HIV	Vietnam	15- to 20-y-old rural youth	Schools Community outreach	8 communities	Tx = 240 C = 240	Participatory group sessions include information on HIV and STIs and community project development and delivery	Improved HIV/AIDS knowledge, self-efficacy and response efficacy for condom use, response to cost of condom use and increased intention to use condoms in possible future sexual encounters	6 mo	No impact on external or internal rewards
Exploring the World of Adolescents											
Pham et al., 2012 [33]	RCT with waitlist control	SRH/HIV	Vietnam	15- to 20-y-olds	Community center/health clinic	NA	Focus on kids = 317 Exploring the World of Ado (EWA) = 281 EWA with parent = 273	10 weekly 2-h sessions to build knowledge and skills, single-sex sessions focused on gender issues, parent sessions focused on knowledge and communication, and workshops for health care workers to improve youth-friendly services	Increased SRH knowledge and improved attitudes	3, 6, 12 mo	Opposite findings for some measures of knowledge and attitudes for all groups at various follow-up periods
Peer intervention on the knowledge and attitudes about HIV/AIDS in adolescents											
Aramburú et al., 2012 [34]	RCT	SRH/HIV	Panama	High school students (mean age 15 y)	School	4 schools	Tx = 354 C = 305	Professionally trained peer leaders of activities and discussions to identify and address risk and protective factors, theatrical presentations, and videos	Improved knowledge of risks and attitude toward knowing the HIV status of their sexual partner Reduced discrimination toward people with HIV Reduced reported embarrassment about purchasing a condom	3 mo	None reported
Parivartan											
Miller et al., 2014 [35]	RCT	Violence prevention Gender equality	India	10- to 16-y-old boys in cricket league	Cricket league team practice		Tx = 168 C = 141	Structured training of cricket coaches to use topic cards to engage young men in reflections on gender roles and discourage disrespectful behavior toward women	Improved gender norms and attitudes	12 mo	No effects on bystander behavior or perpetration of violence

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Table 3
Continued

Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
Let Us Protect Our Future											
O'Leary et al., 2012 [38,39]	RCT	SRH/HIV	South Africa	Grade 6 students	School	18 schools	Tx = 562 C = 495	Six 2-h mixed-sex sessions led by trained facilitators, some sex-specific modules to address gender norms, and homework assignments with parents	Reduced risky sexual behavior Increased self-efficacy and parental engagement	3, 6, 12 mo	None reported
Wake Up											
Heeren et al., 2013 [41]	RCT	SRH/HIV	South Africa	19- to 24-y-olds	University campus		Tx = 91 C = 85	Eight 90-min sessions over 4 wk in mixed-sex groups lead by graduate students	Reduced unprotected vaginal intercourse Increased condom use Improved self-efficacy, SRH knowledge, and attitudes More effective for non-South African students	6, 12 mo	No effect on multiple sexual partners
Community-based ASRH intervention											
Aninanya et al., 2015 [37]	RCT	SRH/HIV Substance use prevention	Ghana	10- to 17-y-olds	School Health clinic Community outreach	26 communities	Tx = 1,288 C = 1,376	Stakeholder meetings, health worker training, in-school curriculum, and peer outreach to youth not attending school	Increased SRH knowledge and attitude, satisfaction with health services, STI management, and usage of pregnancy and birth-related health services	3 y	No effect on HIV testing and counselling
Peer-led education program for HIV/AIDS											
Ibrahim et al., 2012 [42]	RCT	SRH/HIV	Malaysia	17- to 24-y-old college students	University		Tx = 137 C = 144	Eight peer-to-peer workshop sessions focused on HIV prevention skills and behaviors	Reduced HIV substance use risk behavior Improved SRH knowledge and attitude	3 mo	None reported
Responsible, Engaged, and Loving Fathers (REAL)											
Ashburn et al., 2017 [36]	RCT	Violence prevention	Uganda	16- to 25-y-old fathers of 1- to 3-y-olds	Community orgs	NA	Tx = 232 C = 169	Mentoring of young fathers and poster campaign focused on nonviolent parenting skills and norms	Reduced intimate partner violence and use of physical punishment. Increased attitudes against physical punishment and confidence in ability to use nonviolent discipline Improvement in communication skills, more time with the child, and positive parenting	10, 18–22 mo	No effect on traditional gender norms

Table 3
Continued

Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
Life Skills for mental health promotion											
Srikala and Kishore, 2010 [44]	RCT	Mental health	India	14- to 16-y-olds	Schools	NA	Tx = 605 C= 423	Life skills training in school	Improved self-esteem, perceived coping, adjustment in school and with teachers, and prosocial behavior	12 mo	No impact on conduct problems, emotion problems, hyperactivity, and adjustment with parents and peers
Step II for HIV and alcohol use prevention											
Chhabra et al., 2010 [45]	RCT	SRH/HIV Substance use prevention	India	13- to 16-y-old rural youth	School Community orgs	23 schools	Tx = 630 C = 624	Classroom curriculum on HIV/AIDS and alcohol abuse, soft skill training, and development of individual values	Improved communication skills among females only Reductions in intend to use alcohol, tobacco, or other drugs	10 wk	No overall significant effects or effects for males on knowledge, efficacy, risk, or confidence
Keepin' it REAL											
Marsiglia et al., 2014 [46] Marsiglia et al., 2015 [47]	RCT	Substance use	Mexico	Early adolescent urban youth	School	2 schools	Tx = 206 C = 225	Teacher-led curriculum focused on refusal skills and avoidance strategies	Reduced amount and frequency of alcohol among females	8 mo	No effect on cigarette use No effect on alcohol for males
Romanian peer-led smoking prevention											
Lotrean et al., 2010 [48]	RCT	Substance use	Romania	13- to 14-y-olds	School	20 schools	Tx = 523 C = 548	Five 45-min sessions using a peer-led video strategy	Reduced smoking onset, positive attitudes toward smoking, and intentions to smoke Improved social self-efficacy	9 mo	No effect on some attitude measures and emotional or situational self-efficacy
Questscope											
Morton, et al., 2012 [43]	RCT with waitlist comparison	PYD Delinquency	Jordan	13- to 21-y-olds	Single-sex groups in community orgs and school buildings		Tx = 67 C = 60 85% male	Education support through group sessions plus recreational activities	Reduced conduct problems	4 mo	No effects on self-efficacy, social skills, social supports, overall difficulties, or adult connectedness
Stepping Stones											
Jewkes et al., 2008 [52]	RCT	SRH/HIV Employment Violence prevention Gender equality	South Africa	16- to 20-y-olds	Community orgs	70 villages/ townships	Tx = 1,409 C = 1,367	Thirteen 3-h sessions in single-sex groups led by trained same-sex and age facilitators, three combined mixed-sex group sessions, and one community meeting	Reduced HSV-2 prevalence Reduced self-reported intimate partner violence, problem drinking, and transactional sex among men	12, 24 mo	No impact on incidence of HIV No effect on risk behavior or risk exposure for women

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Table 3
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Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
Creating Futures/Stepping Stones											
Jewkes et al., 2014 [54]	Quasi-experimental interrupted time series	SRH/HIV Employment	South Africa	18- to 34-y olds (most under 30 y old)	Community outreach		232	Stepping Stones program followed by 11 3-h sessions helping participants find work, build businesses	Increased earnings, improved gender attitudes Decreased depression, suicidal thoughts, and relationship control behaviors among men Reduced physical and/or sexual abuse reported among women	7, 14 mo	No impact on several other economic and relationship indicators
Street Smart plus vocational training											
Rotheram-Borus et al., 2012 [55]	RCT with waitlist control	SRH/HIV Employment	Uganda	13- to 23-y-olds	Community orgs	NA	Tx = 50 C = 50	Classes daily for 4 −8 h, 5 d/wk for 10 wk, apprenticeships with local artisans Artisans received a 5-d training on HIV and how to supervise youth	Reduced delinquent behaviors and improved employment, quality of life, and social support	4, 24 mo	No effect on sexual risk behavior
Teaching Recovery											
Qouta et al., 2012 [56]	RCT	Mental health	Palestine	10- to 13-y-old war-affected youth	School	NA	Tx = 242 C = 240	CBT methods, coping skills training, creative expression, homework involving parents	Reduced PTSD diagnoses	6 mo	No effects on overall symptom level or measures of psychological distress, except for girls with low risk
Program for war-affected young people											
O'Callaghan et al., 2014 [57]	RCT	Mental health	Democratic Republic of Congo	7- to 18-y-olds who have been abducted in war-torn areas	Community orgs	NA	Tx = 79 C = 80	Eight 2-h sessions for youth and their caregiver led by trained female facilitators offering life skills, mobile cinema clips, and relaxation techniques	Improved PTSD symptoms	3 mo	No effects on conduct, depression, anxiety, or prosocial attitudes
Yes Youth Can											
NORAC, 2014 [58]	Quasi-experimental	SRH/HIV Employment	Kenya	18- to 35-y-olds	School Community orgs		Tx = 6,370 C = 3,216	Infrastructure for youth to form groups and work toward group-determined goals, training (e.g., life skills), funding for projects, and support for county and national organizational structure	Increased asset ownership, political empowerment, self-efficacy, and attitudes about community supportiveness	18 mo	No impact on income or some political empowerment items or attitudes toward other ethnic groups

Table 3
Continued

Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
Akazi Kanoze Alcid et al., 2014 [59]	RCT	Employment	Rwanda	14- to 35-y-olds: over 95% 15- to 29- y-old	Community orgs	NA	Tx = 300 C = 300	Work readiness curriculum including soft skills, general educational needs, and specialized training with workforce linkages	Increased number of employed youth and improved ability to apply for a job, develop a business plan, understand marketing techniques, likelihood of having savings and a mentor	10 mo	Intervention only effective in one of two districts. Most impact on female and lower educated youth No impact on business startup or work improvement skills
Pro Joven Diaz and Rosas, 2016 [60]	Quasi-experimental	Employment	Peru	14–26	Community orgs Health clinics Home/homework w/parents	NA	Tx = 2,378 C = 546	Individual vocational training and internships	Increased the probability of employment, paid employment, having a job with health insurance or a pension Improved earnings Primarily effective for females and youths between 14 and 18 y of age	6, 12, 18 mo	None reported
Juventud y Empleo Ibarraran et al., 2014 [61] Ibarraran et al., 2015 [49]	RCT	Employment SRH/HIV	Dominican Republic	16- to 29-y-olds	Workplace and training centers		Tx = 3,250 C = 1,750	Life skills training and vocational training and internships	Increased employment with written contract, monthly earnings, educational expectations, and perception of health Reduced pregnancy and duration of unemployment Increased employed with health insurance among men	2, 6 y	No impact on earnings, overall employment Long-term impacts limited to formal employment and stronger for men
Supporting adolescent orphan girls to stay in school as HIV risk prevention											
Hallfors et al., 2011 [62] Hallfors et al., 2015 [50]	RCT	SRH/HIV education	Zimbabwe	10- to 16-y-old orphan girls	Schools	26 schools	Tx = 184 C = 145	Material and mentoring support for orphan girls to keep them in school	Improved educational behavior outcomes, SRH knowledge and attitudes, and gender norms After 5 y: Reduced the likelihood of marriage, and improved school retention and food security	5 y	No effects on HIV or HSV-2

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Table 3
Continued

Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
SHAZ											
Dunbar et al., 2014 [63]	RCT	SRH/HIV Employment/ economic development	Zimbabwe	17- to 19-y-old girls not in school	Community orgs Health clinics Home/homework w/parents		Tx = 158 C = 157	Life-skills and health education, vocational training, microgrants, and social supports	Increased food security, having own income	24 mo	No effect on received social support, relationship power, contraception, sexual activity, HIV, HSV, unintended pregnancy, or sexual risk
The Empowerment and Livelihood for Adolescents program (ELA)											
Bandiera et al., 2017 [64]	RCT	Violence prevention Employment SRH/HIV Gender equality	Uganda	14- to 20-y-old girls	Community orgs	150 communities; 100 treatment and 50 control	Tx = 3,964 C = 2,002	Safe local community clubs for young women, vocational and life skills trainings, and recreational activities	Improved knowledge related to pregnancy and HIV, self-report always uses condom Reduced married or cohabitating, having sex unwillingly in the past year, and having children Increased self-employment	2 y	No impact on satisfaction with earnings or wage employment
BALIKA											
Amin et al., 2016 [65]	RCT	SRH/HIV Gender equality Education employment	Bangladesh	12- to 18-y-old girls	School Community orgs	96 communities: Tx = 72 C = 24	9,000+	Educational support delivered in four versions: tutoring, gender awareness, livelihood skills, and community engagement, each with different activities	Reduced child marriage, increased SRH knowledge Increased school attendance, private tutors, experience in working for pay (gender awareness and livelihoods interventions), indicators of social freedoms and reduced harassment outside of home (gender awareness and education interventions)	18 mo	No impact on no. of hours worked, earnings, harassment inside the home/ family or birth control Livelihood intervention had no impact on social freedoms
ACTIVITAL											
Andrade et al., 2014 [66]	RCT	Physical fitness	Ecuador	12- to 15-y-olds	School	20 schools	Tx = 550 C =533	Classroom curriculum, physical activities, six workshops for parents, events with prominent athletes, and new walking trail	Increased objective measures of physical fitness and prevented decline in physical activity over time	2 y	No effects on screen time or BMI

Table 3
Continued

Citation	Evaluation design	Sectors	Country	Recipient age	Setting	Clusters	Sample size	Brief description	Outcomes	Follow-up period	Null or opposite findings
I (Yo), Think (Pienso), Feel (Siento), and Act (Actuo) Araya et al., 2013 [75]	RCT	Mental health	Chile	13- to 15-y-olds	School	26 communities	Tx = 1,288 C = 1,376	10 group sessions covering coping with thoughts and emotions and problem-solving Booster sessions at 2 and 7 mo after last session		3, 12 mo	No meaningful outcomes Effect on anxiety was statistically significant but not considered clinically relevant

ASRH = Adolescent Sexual and Reproductive Health; C = control or comparison; CBT = cognitive behavioral therapy; HSV = herpes simplex viruses; PTSD = posttraumatic stress disorder; RCT = randomized controlled trial; SRH = sexual and reproductive health; STI = sexually transmitted infection; Tx = intervention condition.

completion. One program targeted PYD constructs as primary outcomes. Using a universal curriculum delivered by trained teachers, the Child Resilience program implemented in Uganda [26] showed significant improvements in child and parent reports of child well-being. Eight other school-based programs emphasized life skills and coping strategies using interactive activities to impact health-risking behaviors. A life skills training approach to prevent suicide in Cambodia improved relationships as well as life skills [27]. A similar program for girls in Iran to prevent violence and promote gender equality had impacts on attitudes and communication skills [28]. A program in India, Girls First, had similar effects on emotional resilience, self-efficacy, and well-being [29]. A life skills with HIV/AIDS education program delivered by health teachers in South Africa showed improvements in knowledge and attitudes about sexual risk [30]. Similar impacts on knowledge and attitudes have been shown for several programs in other parts of the world, including Focus on Kids China [31], Focus on Kids Vietnam [32], and Exploring the World of Adolescents in Vietnam [33]. A program in Panama [34] that emphasized peer-to-peer activities influenced knowledge and attitudes related to sexual and reproductive health (SRH). In some cases, nonsignificant findings were reported on targeted outcomes [27,29,30,32], and in one case, there were unexplained significant negative effects on some measures of targeted knowledge and beliefs [33]. One program with impact on PYD mediators was not delivered in school and was exclusively for adolescent boys. In India, the Parivartan program, which trained cricket coaches to facilitate gender topic discussions with their players, showed a significant shift toward more respectful attitudes toward women and greater willingness to intervene when witnessing disrespectful behavior toward women but had no impact on self-reported behaviors [35].

Behavioral outcomes

Eleven programs demonstrated impacts on youth behaviors but not more distal positive youth outcomes. With two exceptions [36,37], all evaluations were conducted within 12 months of program completion. Let Us Protect Our Future, a school-based program in South Africa [38,39], included sessions in mixed-sex groups on gender norms and homework assignments to involve parents in the curriculum. The program reduced self-reported risky sexual behaviors, which were both mediated and moderated by parent involvement variables. The comparison condition was a cognitive-behavioral health promotion program delivered in the same format, which had some impact on diet and exercise, but not sexual behavior or substance use [40]. Another program in South Africa, Wake Up, delivered in mixed-sex groups by university graduate students also showed a reduction in most, but not all, the self-reported risky sexual behaviors [41]. The Adolescent Sexual and Reproductive Health project in Ghana used a multilevel strategy that involved stakeholder meetings, health worker training, in-school curriculum, and peer outreach to youth not in school. In a rare 3-year follow-up, significant increases were reported for the use of most, but not all, health services as well as SRH knowledge and attitudes [37]. A program in Malaysia [42] using peer-to-peer activities influenced knowledge and attitudes related to SRH and reduced self-reported HIV risk behavior related to substance use. The Responsible, Engaged, and Loving Fathers Initiative in Uganda focused on mentoring teen fathers, teaching nonviolent discipline practices, and supporting relationship-building activities between fathers and

young children (1–3 years of age) [36]. This program had no effect on gender norms but reduced self-reported domestic violence, increased communication and positive parenting skills, and improved attitudes toward nonviolent discipline reported at the 18-month follow-up. The Questscope project in Jordan used activities in single-sex group meetings (85% of the sample was male) and reported significant reduction of self-reported conduct problems, although no effect on the intended PYD mediators, primarily self-efficacy [43].

A school-based life skills training approach in India had positive effects on self-esteem, perceived coping, adjustment in school, and prosocial behavior [44]. A similar program in India, STEP II, combined HIV and alcohol use prevention in school settings and showed no overall effects [45], but significant effects on communication skills for girls only. Two school-based programs designed specifically to prevent substance use showed significant effects on self-reported substance use. In Mexico, the keepin' it Responsible, Engaged, and Loving program used a teacher-led curriculum that trained students in refusal skills [46,47] but achieved limited impact on use of alcohol and only for girls. In Romania, peer-led discussions using video clips increased self-efficacy and reduced substance use [48].

Positive youth outcomes

Fourteen of the 35 programs evaluated reported effects on positive youth outcomes related to physical and mental health, income and employment, and gender equality. Six of these also reported effects on PYD mediators (i.e., knowledge, norms, and skills) and/or behaviors (i.e., risky sexual behavior, substance use, interpersonal violence). Most of these evaluations included longer term follow-ups, and two had follow-ups after many years [49,50].

In the area of physical health, we found three programs in sub-Saharan Africa. A randomized control trial of Stepping Stones in rural South Africa showed improved physical health and behavior change. First developed in Uganda [51] and implemented in many countries, Stepping Stones uses a multilevel approach that targets individuals, couples, households, and communities. The South Africa program [52] used a manual with 13 core sessions that covered sexual health along with gender-based violence, dealing with grief and loss, and building assertiveness skills. Jewkes et al. [52,53] found improved health by reducing risk of herpes simplex virus 2 acquisition by one third over 2 years of follow-up but did not reduce the incidence of HIV infection. The program also changed behavior by reducing the perpetration of intimate partner violence reported by male participants but had no impact on risk behaviors of women. Creating Futures combined a broad economic empowerment intervention with the original Stepping Stones package. It demonstrated effects on many, but not all, of the intended outcomes. The study found average earnings of participants were more than double that of controls [54]. Young men and women in the intervention scored significantly better on tests of gender equality attitudes, men reported significantly reduced controlling practices in their relationships, and the prevalence of depression symptoms and suicidal thoughts among men decreased significantly relative to controls. Women reported less interpersonal violence in the prior 3 months than controls. In Uganda, a version of Street Smart (a multisession HIV prevention program delivered in small groups) was combined with vocational training and apprenticeships with employers who received training in topics pertinent to employing young people. The addition of employment support improved employment, quality of life, and perceived social support while reducing self-reported delinquent behavior over 2 years [55].

Two programs had limited impact on mental health. In Palestine, a universal school-based intervention known as Teaching Recovery uses cognitive behavioral therapy techniques—combined with homework involving parents and family members—to reduce the detrimental impact of war. An evaluation showed reduced posttraumatic stress disorder diagnoses but no impact on overall symptoms and effects on other measures of distress [56]. A program in the Democratic Republic of the Congo designed specifically for war-affected youth [57] combining life skills with relaxation techniques and including participation by the youth's caregiver showed improvements in emotional stability but no impact on depression or anxiety.

Four programs demonstrated effects related to employment. The Yes Youth Can program in Kenya combined school and community organization strategies. Participants reported increased likelihood of asset ownership but not income, improvements in self-efficacy, and increased perceptions of community supportiveness [58]. Three programs designed to increase employment provided vocational training as well as work-related soft skills such as communication and problem-solving. Akazi Kanoze in Rwanda demonstrated positive effects on skills as well as employment, but effects were limited to women and those with lower income [59]. Pro Joven in Peru increased earnings, the likelihood of employment and paid employment, having employer-provided health insurance and pensions [60] over an 18-month follow-up period. Effects were strongest for females and younger participants (aged 14–18 years). The Juventud y Empleo program in the Dominican Republic included internships and demonstrated increased contractual employment, higher monthly earnings, and reduced length of unemployment [49,61] over 2 years and increased formal employment over 6 years. There were no long-term impacts on earnings.

Most of the programs included in this review were designed for both males and females, although several provided services, training, and social opportunities specifically to girls. In Zimbabwe, Supporting Adolescent Orphan Girls provided both material support and mentorship. It significantly improved SRH knowledge and changed attitudes about gender norms, significantly reduced the likelihood of early marriage, and improved school retention and food security over 5 years [50,62]. No effects were observed on HIV or herpes simplex virus. The SHAZ program in Zimbabwe combined life skills training, health education, vocational training, and microgrants to out-of-school girls aged 17–19 years. Although no effects were found on sexual risk behaviors or social support, there were significant increases in food security and the likelihood of having their own income after 2 years [63]. A similar approach was used in the Empowerment and Livelihood for Adolescents program in Uganda [64] where girls aged 14–20 years formed community clubs in which life skills and vocational training and recreational and social activities were provided in a safe environment. Significant improvements were reported for SRH knowledge, consistent condom use, self-employment (but not wage employment), reduced early marriage, and reduced reports of having sex unwillingly in the past year. In Bangladesh, BALIKA used a girls-only community club approach to provide educational supports through tutoring, gender awareness, livelihood skills, and community engagement. A significant reduction in child marriage and increased working for pay was reported by girls in the program [65]. Other

indicators of economic independence and use of birth control were not influenced.

Our search identified a single program designed to improve physical activity and fitness. This school-based intervention, ACTIVITAL in Ecuador, included teacher-lead activities, parent workshops, and installation of a new walking trail at the school and demonstrated some impact on objective measures of physical fitness after 2 years, but no effects on screen time or body mass index [66].

Discussion

The conceptual framework developed for this review makes explicit the role that PYD constructs play in the logic model of many PYD programs. All programs included in this review used multiple pathways within this model, focusing on at least two, and in most cases three or four of the general PYD domains: assets, agency, contribution, and enabling environment. We identified promising evidence for the effectiveness of a PYD approach in influencing PYD mediators, behaviors, and positive outcomes in LMICs. However, rigorous experimental or quasi-experimental evaluations made up <40% of the evaluations that we found, and very few reported results beyond short-term outcomes. Almost all the evaluations produced mixed results with some evidence supporting positive impact and some nonsignificant findings for hypothesized outcomes.

School curricula delivered in weekly sessions by trained school or project staff demonstrated some success in improving knowledge, attitudes, and soft skills [27,30,32,34]. These programs usually included facilitated interactions and activities to support peer-to-peer involvement [42]. Almost all programs reported impacts on PYD mediators. When skill-building was a target of the intervention, improved skills (both specific and general) were often reported. In a few cases, behavior and mental health outcomes were measured but were not significantly influenced [27,29,30].

We also identified interventions designed specifically for vulnerable populations, such as women and girls [28,29,32,45,62,63,65,67] and war-affected youth [56,57]. However, there were no programs designed to address several other vulnerable subgroups, including sexual minority youth and youth with disabilities who have been shown to be at elevated risk for victimization, unemployment, and poor health outcomes [68–71]. The evidence we did find supports using PYD approaches with vulnerable or underserved populations to reduce disparities in assets, agency, contribution, and enabling environments. This suggests that when disparities in PYD constructs are narrowed, disparities in positive youth outcomes such as income and health can also be reduced [37,58–63,65].

A number of programs combined efforts to reduce behavioral health problems (e.g., sexual or substance related) and improve gender equality, education, or employment with positive effects [50,54,55,61,62,67]. Most of these programs showed some impact on PYD constructs, behavior change, and positive youth outcomes such as income, food security, or reductions in child marriage [65]. This includes two female-only programs that addressed girls' particular disadvantages in education, employment, and control over their sexual risk.

Of the programs with rigorous evaluations, the programs that intentionally targeted several related positive youth outcomes are the most promising for larger scale implementations. Many of these programs encouraged youth engagement in the implementation of the program through creating groups, participating in decisions about topics and activities within the programs and through providing peer support. Direct involvement of young people in developing new programs was less evident, but there is growing evidence that youth involvement in every level of decision-making could improve program outcomes [72].

Limitations

Most systematic reviews start with a single outcome of interest or a relationship between a class of interventions and a single outcome (e.g., family-oriented programs designed to prevent violence). For this review, the search terms used to identify different PYD constructs were many and varied; a large developmental period was covered (i.e., childhood, adolescence, and young adulthood); and diverse types of interventions across a broad set of outcomes were included. As a result of this intentionally broad scope, a large number of titles were retrieved and screened. The number and complexity of search terms may have resulted in missing some relevant studies.

Besides the limitations encountered in conducting the review itself, there are limitations in the interpretation of results found in these evaluations. In most cases, nonsignificant results were reported along with significant ones, but it is possible that some intended effects were found to be nonsignificant but not reported, leading to an overly positive impression of the program. Program descriptions are limited to what was available in reports and publications, making it impossible to make stronger statements about which program features or characteristics lead to positive results.

Recommendations

1. Expand specific PYD program models that have demonstrated efficacy across multiple outcomes.
   There is evidence that programs that combine SRH and HIV prevention with workforce readiness and violence reduction obtain positive outcomes related to employment and reductions in gender-based violence, as well as other behavioral health problems. By intentionally targeting several predictors of problem behaviors and outcomes across multiple areas (health, employment, and education), PYD programs hold the promise of effectively increasing the return on prevention investments [73]. PYD programs ideally strengthen multiple PYD mediators, preferably with multiple targets (e.g., youth, teachers, and civic leaders) using multiple strategies. A strong evaluation of program impact should include measures of all the potential outcomes related to the PYD mediators targeted in the intervention.
2. Conduct rigorous randomized controlled trials on promising programs with longer term follow-up.
   Once a program has been shown to be feasible and has promising short-term impact, it is essential to investigate longer term follow-up to identify programs that have lasting effects.
3. Design evaluations to test for the mediating effect of PYD constructs on targeted behaviors and intended outcomes.
   In only one case did we find an evaluation focused on demonstrating the mechanisms by which the program had its impact on outcomes [38]. To build knowledge on how PYD might be having a positive impact on the lives of youth in

LMICs, we need to demonstrate what levers are working in PYD programs.

4. Assess program impact on typically excluded high-risk youth. None of the 35 programs we identified with rigorous evaluations was designed to address sexual minorities or young people with disabilities. Although a PYD program may be especially beneficial to various high-risk youth groups, we cannot assume current programs meet their needs.
5. Include benefit/cost data in program evaluations. None of the 94 program evaluations we identified provided evidence of cost-effectiveness. Increasingly, this kind of information is needed to assess whether large-scale implementation is desirable [74].

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