Children and Youth Services Review 73 (2017) 375–383

Contents lists available at ScienceDirect

Children and Youth Services Review

journal homepage: www.elsevier.com/locate/childyouth

Sexual health programming for vulnerable youth: Improving knowledge, attitudes, and behaviors

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ARTICLE INFO

Article history:
Received 12 September 2016
Received in revised form 13 January 2017
Accepted 14 January 2017
Available online 16 January 2017

Keywords:
Sexual health
Pregnancy prevention
HIV prevention
Foster care
Child welfare
Adolescence

ABSTRACT

Purpose: Among girls in foster care, 48% become pregnant at least once by age 19 (Dworsky & Courtney, 2010). Youth in or at-risk for foster care (YFC) report limited knowledge about, access to, and use of condoms; ambivalent attitudes towards teen parenting; and participation in other risky behaviors. For the current study, we adapted and supplemented an evidence-based sexual health program called SiHLE, using a systematic adaptation framework (ADAPT-ITT, Wingood & DiClemete, 2008), to address the unique and targeted needs of youth living in a temporary shelter due to lack of housing. Youth in this study were either in foster care and awaiting placement, or having serious family problems and were at-risk of entering the foster care system.
Methods: Thirty-six youth participated in SiHLE-YFC during their stay at a temporary shelter. Four 90-minute sessions focused on increasing sexual health knowledge, improving attitudes towards and self-efficacy of condom use, and developing core skills such as problem-solving and communication.
Results: As hypothesized, youth showed high satisfaction with the intervention and significant improvement in sexual health knowledge from pre to post. At one-month follow-up, youth continued to show significant improvement in sexual health knowledge, along with a significant reduction in risky sexual behaviors. Though not significant, there were moderate effect sizes for changes in attitudes towards teen pregnancy and condoms. There were no changes in attitudes towards teen parenting.
Conclusion: Taken together, findings suggest that sexual health education directly targeting the unique needs of YFC may improve sexual health knowledge and behavior, and are discussed in the context of challenges associated with intervention and research with this population.

1. Introduction

Nearly half of 500,000 youth in foster care are adolescents at risk for poor mental health outcomes (Child Welfare Information Gateway, 2015). Compared to children not in foster care, they are more likely to report histories of trauma, live in poverty, and come from families who experience multiple stressors (Connell, Bergeron, Katz, Saunders, & Tebes, 2007; McGuinness & Schneider, 2007). This may be exacerbated further following placement outside of the home, leading to disruption of family, peer, and community relationships (Boonstra, 2011; Cunningham & Diversi, 2013). These vulnerabilities, in turn, place youth at risk for unhealthy trajectories characterized by sexual risk-taking, STDs, teen pregnancy, mental health problems, substance abuse problems, and juvenile justice involvement. The risk for teen pregnancy, in particular, significantly exceeds the risk of their peers not involved in foster care (Dworsky & Courtney, 2010) with rates reaching up to 50% by the time they age out of the system. Despite these alarming rates, there are currently no evidence-based sexual health programs specially designed to leverage the strengths or mitigate the unique risks for youth in care.

1.1. Sexual health among youth in foster care

Adolescence has long been recognized as a period of enhanced risk-taking (World Health Organization, 2012). Despite a decrease in early onset of sex and increase in contraceptive use in the past 10 years, approximately 50% of US high school youth have had sexual intercourse, and about 6% of them had their first experience before age 13; this rate rises to 13% for African American youth (Eaton et al., 2012) and to 20% for youth in foster care (James, Montgomery, Leslie, & Zhang, 2009). Significant interest in sexual risk taking among youth in foster care is represented by two decades of epidemiological studies examining national (Carpenter, Clyman, Davidson, & Steiner, 2001; Pecora et al., 2003) and regional data (e.g., Courtney & Dworsky, 2006; Dembo, Schmeidler, & Childs, 2007) in addition to a smaller number of outcome studies (Slonim-Nevo, 2001; Slonim-Nevo, Auslander, Ozawa, & Jung, 1996). Youth in foster care experience disproportionately higher rates of teen pregnancy (Winter, Brandon-Friedman, & Ely, 2016). Studies

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http://dx.doi.org/10.1016/j.childyouth.2017.01.013
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point to older age, history of sexual abuse, and externalizing problems as the most robust predictors of sexual risk-taking (Ramseyer Winter, 2016). Amid persistent controversy regarding whether or not youth with a history of foster care placement engage in more risky sexual behaviors, compelling data point to earlier sexual initiation and more sexual partners as risk factors (e.g., Ahrens, Stansell, & Jennings, 2010; Boonstra, 2011; Carpenter et al., 2001; Gramkowski et al., 2009; James et al., 2009; Ramseyer Winter, 2016). Despite reductions in teen pregnancy nationwide, pregnancy rates among foster care girls also remain high, more than double those of their peers (Courtney, Terao, & Bost, 2004). Nearly half (48%) become pregnant by age 19 and 30% by age 17 (Dworsky & Courtney, 2010) compared to 20% and 13.5% of teens in a national sample (Harris et al., 2009), and repeat pregnancies are also frequent and disproportionate (Dworsky & Courtney, 2010; King, Putnam-Hornstein, Cederbaum, & Needell, 2014; Putnam-Hornstein & King, 2014).

Consequences of teen parenting are well documented, and include social, economic, school and emotional problems for mother, father, and baby. Mothers are less likely to complete high school (Fergusson, Woodward, & Horwood, 2000; Hofferth, Reid, & Mott, 2001), more likely to receive public aid (Sarri & Phillips, 2004), and are at higher risk for depression including post-partum depression (Figueiredo, Pacheco, & Costa, 2007; Patel & Sen, 2012; Schmidt, Wiemann, Rickert, & Smith, 2006). Teen fathers also have lower school attainment and fewer job opportunities, greater psychological difficulties and higher risk for delinquency (Bunting & McAuley, 2004; Stouthamer-Loeber, Loeber, Wei, Farrington, & Wikström, 2002). Babies born to teen parents are more likely to be born premature or low birth weight, abused, end up in state care, have poor cognitive development and more behavioral problems (McFarlane, Parker, & Soeken, 1996; Connelly & Straus, 1992). Boys born to teen parents are more likely to be incarcerated and girls born to teen parents are more likely to become teen mothers compared to children born to adult mothers (Rafferty, Griffin, & Lodise, 2011; Terry-Humen, Manlove, & Moore, 2005). For youth in foster care, negative consequences of teen parenting may be exacerbated by their lack of family support and structure. According to 2011 national statistics, costs associated with teenage pregnancy equaled $9.4 billion, reflecting increased healthcare, foster care, incarceration of children of teen parents, and lost tax revenue because of low employment among teen mothers (Martin, Hamilton, Osterman, Curtin, & Mathews, 2013).

1.2. Sexual health and pregnancy prevention for youth in foster care

Goesling, Colman, Trenholm, Terzian, and Moore (2014) offer a thorough and systematic review of 31 evidence-based adolescent sexual health programs. Of these, 22 had a statistically significant impact on youth sexual activity, six did not have an impact and three did not measure sexual activity as an outcome. Among other outcomes measured, 14 of 22 had a statistically significant positive impact on contraceptive use and five of five had a statistically significant positive impact on rates of STD and pregnancy or birth outcomes. Although programs use different strategies or target different age groups, genders, ethnic or special risk groups, most sexual health interventions include a set of common elements that are hypothesized to facilitate improvements in attitude or behavior.

Effective sexual health programs actively engage youth; provide developmentally appropriate knowledge; shape attitudes, norms, and self-efficacy; and teach behavioral skills such as goal-setting, problem-solving, and communication (Albarracín et al., 2005; Boustani, Frazier, Becker et al., 2015; Kågesten, Parekh, Tunçalp, Turke, & Blum, 2014; Rotheram-Borus et al., 2009). Some have been designed with close attention to the unique needs of particular groups, such as Assisting in Rehabilitating Kids (St. Lawrence, Crosby, Brasfield, & O'Bannon, 2002) for youth abusing substances; Project IMAGE (Champion & Collins, 2012) for ethnic minority adolescent females with a history of abuse and STDs; Safer Sex (Shrier et al., 2001) for youth who have a history of STDs; Rikers Health Advocacy Program (Magura, Kang, & Shapiro, 1994) for incarcerated youth; and SiHLE for African-American heterosexual females (DiClemente et al., 2004). Despite well-documented elevated and persistent rates of sexual risk-taking and pregnancy among youth in foster care, their unique needs have been left unaddressed by currently available programs. We propose that the literature points to the following unique needs for youth in foster care: (a) lack of knowledge, access, and use of condoms, (b) ambivalence about teen parenting, and (c) broader vulnerability for high-risk behaviors (Fig. 1).

1.2.1. Lack of knowledge, access, and use of condoms

Foster youth report that sexual health information is available too late (Boustani, Frazier, Hartley, & Meinzer, 2015; Dworsky & DeCoursey, 2009; Kirby & Laris, 2009; Love, McIntosh, Rosst, & Tertzakian, 2005). Perhaps because sexual initiation occurs earlier among foster youth compared to non-foster peers (Hoffman, 2006), they are already sexually active by the time they first receive any information about birth control (Love et al., 2005). Youth have too little information, misinformation, and concerns that condoms might ruin the mood or decrease pleasure (Love et al., 2005). Foster care youth also cite that they either find it challenging to access condoms and general sexual health care, or they are afraid or embarrassed to seek it (Leonard, Dixon, Fantroy, & Laffert, 2013; Freundlich, 2003).

1.2.2. Ambivalence about teen parenting

Furthermore, although many teen pregnancies are unplanned, up to 35% of them are intended (Hacker, Amare, Strunk, & Horst, 2000; Leonard et al., 2013). Vulnerable teens, such as youth in foster care or at-risk for foster care, may perceive that advantages of having a baby to outweigh the costs (Love et al., 2005; Boustani, Frazier, Hartley et al., 2015). Desire for pregnancy is associated with family dysfunction and lack of family connectedness (Boustani, Frazier, Hartley et al., 2015; Hacker et al., 2000) that often characterizes foster care youth. Youth report several reasons for getting pregnant such as wanting to heal childhood wounds or obtain emotional closeness (e.g., with the baby or baby's father; Boustani, Frazier, Hartley et al., 2015; Gordon, 1996; Love et al., 2005; Virginia Teen Pregnancy Prevention). Others report that having a baby may facilitate their exit from the child welfare system and access to independent living (Boustani, Frazier, Hartley et al., 2015; Davies et al., 2003; Stevens-Simon, Kelly, Singer, & Cox, 1996).

1.2.3. Broader vulnerability for high-risk behaviors

Youth in foster care are at disproportionate risk for a trajectory of co-occurring negative outcomes. Epidemiological statistics reveal overall heightened prevalence of mental illness, with mental health disorder rates as much as two and a half times higher than community samples (e.g.: Clausen, Landsverk, Ganger, Chadwick, & Litrownik, 1998; Trupin, Tarico, Low, Jemelka, & McClellan, 1993). More recent reports show 28% (Auslander et al., 2002) to 51.1% (James et al., 2009) of youth in care meet clinical cutoffs on standardized measures of externalizing behavior problems, and 25% meet cutoffs for internalizing problems (James et al., 2009); rates more than double those of community samples (http://www.nimh.nih.gov/health/statistics/prevalence/any-disorder-among-children.shtml) and higher than children living in poverty (Heneghan et al., 2013; Masi & Cooper, 2006; McMillen et al., 2005). Finally, substance abuse and delinquency are widespread (James et al., 2009).

1.3. Current study

We propose that currently available evidence-based sexual health interventions are necessary but not sufficient for vulnerable youth, such as youth in foster care, child welfare involved youth or youth with poor family attachment or at-risk for foster care (we will refer to them as YFC – Youth in or at-risk for foster care) for the following reasons: 1) Programs don't address the ambivalence about teen parenting;

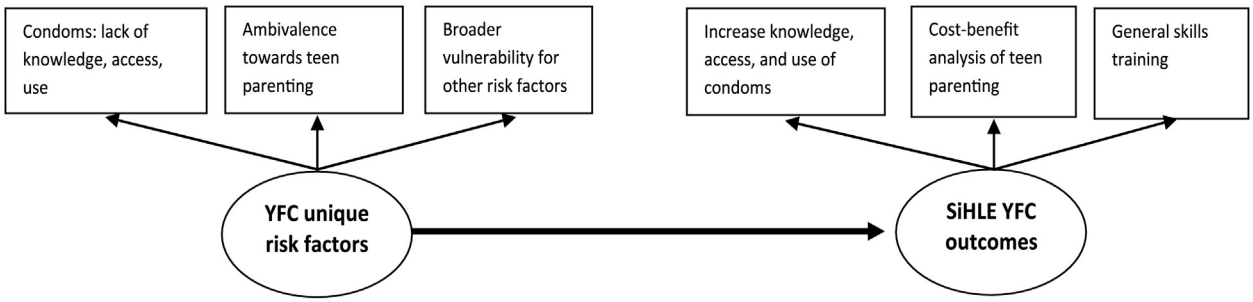

Fig. 1. Conceptual model.

2) Many programs have multiple sessions that are not suitable for an environment with high turnover; 3) Broadly relevant skills such as problem-solving and communication are limited to examples involving sexual encounters, minimizing their potential generalization to other settings. To our knowledge, the only sexual health intervention intended specifically for YFC is Power through Choices (Becker & Barth, 2000), developed in the mid-1990s; overlapping in content, format, and duration with other programs; but not targeting unique risk factors and never rigorously evaluated. In this study, we leveraged intervention design and content that has been modified for other high-risk groups and implemented in community settings towards the development and testing of a sexual health program unique for YFC.

Informed by a growing literature and qualitative data provided by our collaborating teen shelter (Boustani, Frazier, Hartley, et al., 2015), we adapted and supplemented an evidence-based sexual health program – SiHLE – using a systematic adaptation framework (ADAPT-ITT, Wingood & DiClemente, 2008) to address the unique needs of YFC, and tested its impact via an open trial design. We hypothesized that youth would acquire increased sexual health knowledge, have more positive attitudes towards condoms, and more negative attitudes towards teen parenting from pre to post intervention and that these would be sustained at 1-month follow-up, accompanied by reductions in sexual risk-taking behaviors, after youth had returned to their communities.

2. Method

2.1. Research design

This research was conducted in accordance with APA Ethical Guidelines, and with full approval by the University's IRB and our community partner (IRB # 14-0209).

2.1.1. Setting

We partnered over two years with a youth shelter that provides housing, food, schooling, and mental health care services to YFC. Youth are referred by law enforcement, child welfare case managers, brought in by their parents or self-referred. Staff at the shelter are largely of ethnic minority (60% African American; 40% Latino) and hold positions that involve daily contact with youth, including clinicians, nurses, and administrators.

2.1.2. Sample

A total of 118 youth were admitted to the shelter over a nine month period and participated in SiHLE-YFC as part of routine services. Consent from a legal guardian to participate in the research was obtained for 42% of admitted youth (49 of 118). Of the 69 youth for whom consent was not obtained, the majority arrived at the shelter on their own, accompanied by law enforcement or a case manager without authority to grant consent. This was neither a traditional foster care sample nor a traditional shelter sample; however, all youth were child-welfare involved or at-risk for child welfare involvement. Youth were either already in foster care, without placement, undergoing a child welfare investigation or experiencing serious problems at home, and thus temporarily placed at this shelter for three to six weeks. Among the consented 49 youth, two declined to participate, one left the shelter before participating, one did not speak English, and one was attending school outside of the shelter so was not present to receive the intervention. An additional eight youth provided pre-intervention data, but no post-intervention or follow-up data. The final sample thus consisted of 36 consented and assented youth who completed pre-intervention assessments, at least one SiHLE-YFC intervention session, and at least one additional assessment (post-treatment or follow-up). A total of 32 youth (85% of baseline sample) provided data at post-treatment and a total of 17 youth (47% of baseline sample) completed the one-month post-discharge follow-up assessment. Hence, to summarize, pre-intervention n = 36, post-intervention n = 32, and follow-up n = 17.

Youth (n = 36) were 55% male, 44% female, ages 13 to 17, with a mean age of 14.96 (*SD* 1.31). The majority were of racial and/or ethnic minority, with 58.3% identifying as Black and 44.4% as Hispanic. Baseline sexual history varied significantly: 92% (n = 33) identified as heterosexual and 8% (n = 3) as bisexual. A majority of youth (66.7%, n = 24) reported having ever had sexual intercourse, with 47.2% (n = 17) indicating they were sexually active at the time of intake. Mean age at first sexual contact was 12.8 years old (range 10–16), with the exception of one youth who was a victim of sexual abuse and reported first sexual contact at the age of 5 (not calculated in average). Reports of lifetime sexual partners varied from 0 to 20 (M = 5.9, *SD* = 5.8) while partners in the past 6 months varied from 0 to 6 (M = 1.9, *SD* = 2). At pre-intervention, 40% reported ever getting tested for STDs, and 10.5% reported ever testing positive. Eight participants (22%) reported a history of pregnancy or partner pregnancy. Among these, five reported past pregnancies; two of which resulted in live births, two abortions, and one miscarriage. Four participants were pregnant during the study

Table 1
Youth demographics and sexual health.

Gender	Male: 55%	Female: 44%
Age	14.96 (1.31)	
Race	White: 41.7%	Black: 58.3%
Ethnicity	Hispanic: 44.4%	Non-Hispanic: 55.6%
Ever had sex	Yes: 66.7%	No: 30.6%
Sexually active	Yes: 47.2%	No: 50%
Age of sexual initiation	12.8 (2.19)	
Lifetime sexual partners	5.9 (5.8)	
Partners in past 6 months	1.9 (2)	
Ever tested for STDs	Yes: 40%	No: 60%
Ever tested positive for an STD	Yes: 10.5%	No: 89.5%
Ever sexually abused	Yes: 9.7%	No: 90.3%
How often do you use a condom?	Not sexually active	10%
	Occasionally	30%
	Most of the time	25%
	All of the time	35%
Expecting a baby	Yes: 11.1%	No: 88.9%
History of pregnancy (self or partner)	Yes: 22%	No: 78%

(one youth was having a second pregnancy). See Table 1 for a summary of demographics and sexual health data.

2.1.3. Recruitment & consent procedures

All youth admitted to the shelter participated in SiHLE-YFC as part of routine clinical services. Only those with written permission from a legal guardian or caseworker, and those who provided written assent, completed research measures. Consent forms were included within standard intake packets and completed by shelter staff with each youth's parent or legal guardian.

2.2. Intervention selection, adaptation, and implementation

We followed the standardized 8-phase ADAPT-ITT model (Wingood & DiClemente, 2008; see Table 2) to identify, adapt, deliver, and pilot test this sexual health intervention for YFC. We conducted qualitative interviews with staff on-site and focus groups with youth to inform the selection and adaptation of the intervention. Staff and youth identified many benefits to teen parenting, including keeping their partner in the relationship, creating an emotional bond with the baby, becoming independent (financial incentives), and feeling grown-up (Boustani, Frazier, Hartley et al., 2015). After a thorough review of available evidence-based sexual health interventions, SiHLE (Sistas, Informing, Healing, Living, Empowering; DiClemente et al., 2004), an evidence-based HIV prevention program nationally recognized for improving sexual health outcomes for African American females, was selected for its (1) engaging strategies especially developed for minority youth; (2) hands-on strategies to increase condom knowledge and use; (3) emphasis on communication skills, assertiveness training, and insight building that have been identified as most common in the prevention of co-occurring high risk behaviors in adolescents (Boustani, Frazier, Becker et al., 2015); (4) content that staff had identified as critical; and (5) brief format that would facilitate implementation in a shelter site serving highly mobile youth. (See National Registry Evidenced Programs and Practices, NREPP, http://www.nrepp.samhsa.gov/; Program Archive on Sexuality, Health, and Adolescence, PAHSA, http://www.socio.com/pasha.php; and Center for Disease Control, CDC, http://www.cdc.gov/hiv/prevention/research/compendium/rr/complete.html).

Since SiHLE was originally designed for African American heterosexual females, it was adapted in several ways to meet the unique needs of youth in or at risk for foster care. We expanded the intervention to be inclusive of all races, genders, sexual orientations and gender identities and addressed the unique needs of YFC as outlined in Fig. 1: (1) *Access to condoms*: After completing the intervention and learning proper condom use, youth received a supply of condoms before leaving the shelter and information about where to access free condoms in their community; (2) *Ambivalence towards teen pregnancy*: Ambivalence was addressed explicitly through cost-benefit analysis via a role play activity in which youth described the disadvantages of teen parenting to a "friend" who wanted to get pregnant; (3) *Broader vulnerability*: We added a problem-solving module, reflecting findings that problem-solving is ubiquitous to mental health intervention (e.g., Goodman, Gravitt, & Kaslow, 1995) and prevention (Boustani, Frazier, Becker et al., 2015) programs, to strengthen resilience and reduce risk for co-occurring conduct problems (e.g., substance use, delinquency). The resulting adapted intervention was named SiHLE-YFC: Smart teens Informing, Healing, Living, Empowering for Youth in or at-risk for foster care (SiHLE-YFC).

SIHLE-YFC was provided twice per week for two weeks (total of four sessions) on a rolling basis to ensure that all youth completed the program during their 3–4 week stay at the shelter. Sessions lasted 90 to 120 min with an average of 12 youth in attendance. All youth participated in the intervention, as it was integrated into routine clinical services. However, only youth with signed consent and assent completed research measures. The first author (trained in SiHLE by the developers in the context of a separate study) delivered the sessions accompanied by an undergraduate assistant; and at least one staff member attended every session, reflecting the shelter's ongoing commitment, despite challenges associated with staff retention that interfered with their direct implementation. A detailed description of session content is available in Table 3.

Table 2
ADAPT-ITT Phases (Adapted from Wingood & DiClemente, 2008).

	Phase
1	***A**ssessment:* Conduct focus groups and interviews with target population and key stakeholders
2	***D**ecision:* Review EBIs and decide which to be selected. Decide on whether to adopt or adapt EBI.
3	***A**dministration:* Administer a theater test with members of the new target population and invite key stakeholders to observe. Administer a brief survey to elicit reactions. Analyze results of the theater test.
4	***P**roduction:* Produce draft 1 of the adapted EBI. Balance priorities while maintaining fidelity to the core elements and underlying theoretical framework. Develop an adaptation plan. Develop quality assurance and process measures.
5	***T**opical experts:* Identify topical experts. Actively involve topical experts in adapting the EBI.
6	***I**ntegration*: Integrate content from topical experts based on the capacity of the agency, and create draft 2 of EBI. Integrate scales that assess new intervention content in study survey. Integrate readability testing of draft 2 of the EBI to create draft 3.
7	***T**raining*: Train staff to implement draft 3 of adapted EBI.
8	***T**esting:* Test draft 3 of the adapted EBI as part of a pilot study.

2.3. Procedures and timeline

Pre and post-intervention data collection were conducted at the shelter. Intake staff alerted the PI whenever a new youth had been consented into the study. The PI then explained the purpose of the study to the youth during her next visit to the shelter, emphasizing that although their legal guardian had provided consent, they were free to decline participation, without any repercussions. Assented youth completed baseline assessment on their sexual health history and knowledge, and attitudes towards condoms, teen pregnancy, and parenting, before joining the group. All youth, regardless of age or gender, received services together in one group. Attendance was tracked for each participant. Youth completed post-intervention assessment after they had participated in all four SiHLE-YFC sessions (i.e., the full intervention). As per shelter requirements, youth continued to attend intervention sessions if they remained at the shelter even after completing four sessions and their post-test. As a result, there was variability in the number of sessions received by youth depending on their length of stay at the shelter. In addition, youth began the intervention immediately following admission to the shelter (and for consented youth, after completing pre-assessment) – regardless of what session was being covered at that time. Therefore, the group was "open", meaning that youth could join during any session. As a consequence of the transient nature of youth admitted to the shelter, the open group format allowed most youth to receive the full 4 sessions before returning to their homes or community placements. Highly engaged youth who completed the full intervention and remained at the shelter more than three weeks were invited to assume an informal leadership role as "peer facilitator" by modeling activities, explaining concepts, and distributing materials. This maintained their engagement while allowing for (1) additional rehearsal of skills; and (2) opportunity to build self-efficacy. Follow-up data were collected via phone, one month following discharge from the shelter.

2.4. Description of measures

Measures were selected for their strong correspondence to the conceptual model (Fig. 1), prior use with minority youth, and strong psychometric properties.

Table 3
SiHLE-YFC table of contents.

Session	Content	Purpose
1	Problem solving[a]	Go over the steps of problem-solving acronym and practice.
	Values-What matters most	Identify personal values and to understand why it is important to first consider personal values before making a decision.
	Thought works – Visualize 25	To promote the participants' identification of their goals at age 25 and dreams as it relates to valuing themselves.
	Becoming a teen parent[a]	Pros and cons of teen parenting discussion, how does it affect your personal values and life goals.
2	Speaking of STD's	Explain the nature and impact of having an STD.
	Name game	Demonstrate how HIV is spread by heterosexual contact.
	R U at risk?	Discuss sexual behaviors that reduce one's risk.
	Consider this…	Evaluate how getting an STD could affect values and goals.
	Introducing LIPSTICK	Introduce participants to condom use through an acronym.
3	Love and kisses	Review knowledge about risky sexual behaviors.
	What's in it for you?	To reinforce knowledge about STD and pregnancy prevention.
	Why don't young people use condoms?	Discuss the common reasons why young people do not use condoms and reinforce sexual responsibility for condom use.
	K.I.S.S.	Teach a model to assist in communicating about condoms.
	Three ways to say it	Teach passive, assertive, and aggressive communication.
	LIPSTICK "Rehearsal"	Teach the steps for proper condom use.
	RING	Teach the steps for proper female condom use.
4	Condom consumer report	Demonstrate the importance of examining the condom for safety, personal appeal and ease of application.
	Relationships	Describe healthy and unhealthy relationships.
	Pieces and parts	Raise awareness about healthy and unhealthy relationships.
	Abuse	Define verbal, emotional, physical and sexual abuse.
	Partner types	Discuss different types of sexual partners and risk involved.
	Options for self-care	Describe options for safety for unhealthy relationships.

[a] Additions not included in original curriculum. All other activities were not modified from original intervention.

2.4.1. Youth demographics and sexual history form

We collected self-reported descriptive information about age, gender, foster care status, sexual orientation, and sexual health history.

2.4.2. HIV prevention knowledge (Diclemente et al., 2004)

Youth answered 16 true/false questions ($\alpha = 0.68$) related to their HIV knowledge (e.g., People who have the AIDS virus generally feel sick right away) and standard safe practices (e.g., Using oil based lubricants with condoms will reduce the risk of pregnancy and STDs). Youth received 1 point for every correct answer; scores represented the sum of points across all 16 items.

2.4.3. Condom attitudes and self-efficacy scale (Diclemente et al., 2004)

This scale consists of 23 items assessing partner related barriers (6 items, $\alpha = 0.82$), attitudes (8 items, $\alpha = 0.68$), and self-efficacy (9 items, $\alpha = 0.88$) as related to condom use. Youth reported agreement from 1 to 5 (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree).

2.4.4. Problem oriented screening instrument for teenagers HIV/STD risk screen (Rahdert & Czechowicz, 1995)

This questionnaire measures youth sexual behavior with 11 yes/no items related to condom use, number of partners, and risk-taking (e.g., "had sex with two or more people in the past month", "ever had an STD"). It is the first developmentally appropriate HIV/STD-risk screen for use in a wide range of settings and validated with diverse samples across the country (Rahdert, 1997). One point is assigned for each item that is answered "yes" and zero points for those that are answered "no". A total score is calculated by summing across items. Scores that fall in the range of 8 to 11 are considered *high risk of exposure* to HIV/STDs, whereas scores ranging from 0 to 2 are considered *low risk of exposure* (Rahdert, 1997).

2.4.5. Perceived consequences of teenage childbearing scale (Unger, Molina, & Teran, 2000)

Youth reported perceived costs and benefits of teen parenting by rating 11 statements ($\alpha = 0.80$) on a 4-point scale, reflecting the extent to which each statement applied to them (1 = definitely not, 2 = probably not, 3 = probably yes, 4 = yes definitely). Sample items include "I would feel like someone really needs me", "I would feel more like an adult". Responses were averaged to create a score that could range from 1 to 4.

2.4.6. Teen attitude pregnancy scale (Somers, Johnson, & Sawilowsky, 2002)

Youth reported on their attitudes towards teen parenting via 16 items ($\alpha = 0.73$) reflecting future orientation (e.g., "I have plans to further my education"), realism about child rearing (e.g., "I am financially able to be a parent"), personal intentions (e.g., "Birth control is important"), and sexual self-efficacy (e.g., "I can resist sex if contraceptives are unavailable"). Respondents indicate agreement on a scale of 1 to 5 (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). Responses are averaged to create a score that could range from 1 to 5.

2.4.7. Social problem-solving inventory for adolescents (Frauenknecht & Black, 1995)

The SPSI-A, short version consists of 30 items ($\alpha = 0.93$) representing problem-solving and decision-making skills in adolescents (e.g., "When I have a problem, I think of the ways that I have handled the same kind of problem before"). Youth report how true each statement is of them on a scale from 1 to 5 (1 = not at all true of me, 2 = slightly true of me, 3 = moderately true of me, 4 = very true of me, 5 = extremely true of me). Responses are averaged to create a score that could range from 0 to 4.

2.4.8. SIHLE-YFC satisfaction scale

After every session, all youth (regardless of study participation) anonymously rated their satisfaction with the session on a 4-point Likert scale (1 = I liked it a lot, 2 = It was OK, 3 = Meh, 4 = I did not like it at all). This scale was developed for use in this study to assess acceptability and inform improvement.

2.4.9. Data analysis

Paired samples *t*-tests and Cohen's d effect sizes were calculated to examine change over time in youth sexual health knowledge, attitudes and, behaviors.

3. Results

3.1.1. Intervention implementation

The full intervention (4 sessions) was delivered 12 times over 9 months. Youth participated in 1 to 12 sessions (M = 6.5, *SD* = 3.04), with 75% of youth participating in a full cycle of the intervention (4 sessions) at least once and 36% of youth participating in a full cycle of the intervention a second time (eight sessions total). Because of rolling admission into the shelter and ongoing service delivery, it was not possible to always begin at session 1 (53%). Some youth started the intervention at session 2 (25%), session 3 (17%) or session 4 (6%).

However, sessions were structured so that content did not depend on knowledge received in a prior session. Furthermore, youth completed their post research assessment after completing four sessions (a full dose of the intervention) regardless of which session was their first. Attendance was mandatory for all youth and average attendance per session (including youth not enrolled in the study but receiving services) was 11.4 youth per session ($SD = 2.64$, range = 6–16). Seventy-six anonymous satisfaction reports were collected (including from youth receiving the service but not participating in the research). Youth reported high satisfaction with group content: 76.4% reported that they liked the group "a lot" and 18.6% rated the group as "OK". Satisfaction did not differ across the four sessions.

3.1.2. Preliminary analyses

Data were analyzed only for participants who had a minimum of two time points of data available. There were no differences in demographics (age, gender, race, and ethnicity) between youth who were retained (n = 17) or lost (n = 19) at follow-up. Youth differed only on baseline condom use, such that youth lost at follow-up reported higher frequency of using condoms compared to youth retained at follow-up. *t*-Tests on baseline data revealed that youth retained at follow-up exhibited more sexual health knowledge (M = 8.35 versus 4.84) and reported more sexual risk-taking (M = 4.53 versus 2.00) compared to youth lost at follow-up. There were no differences at post-test between these groups. Results are reported in Table 4.

3.1.3. Pre to post-intervention change

Pre to post-intervention change was available for 32 youth (89% of the sample) and analyzed using paired samples *t*-tests and Cohen's d effect sizes. Youth significantly increased their sexual health knowledge from pre to post $t(31) = 6.81$, $p < 0.001$, $d = -1.08$. Problem-solving skills $t(31) = -0.14$, $p - 0.89$, $d = -0.02$, sexual risk behaviors, $t(31) = 1.37$, $p = 0.18$, $d = 0.26$, attitudes towards condoms, $t(31) = 0.10$, $p = 0.31$, $d = 0.16$, teen pregnancy, $t(31) = 0.63$, $p = 0.54$, $d = 0.07$, and teen parenting, $t(31) = 0.40$, $p = 0.69$, $d = 0.02$, remained unchanged.

3.1.4. Pre to follow-up change

Follow-up data were available for 47% of the sample (17 of 36 youth). Of these, 62.5% of this subsample reported being sexually active in the past two weeks. Sexual health knowledge increased, $t(16) = 7.14$, $p < 0.001$, $d = -1.71$, and sexual risk-taking decreased, $t(16) = 3.11$, $p < 0.01$, $d = 0.82$, from pre to follow-up. Attitudes towards condoms improved and change was marginally significant with a large effect size $t(16) = 2.01$, $p = 0.06$, $d = 0.32$. Problem-solving skills, $t(16) = -1.61$, $p = 0.87$, $d = -0.04$, negative attitudes towards teen pregnancy, $t(16) = 1.75$, $p = 0.09$, $d = 0.27$, and teen parenting, $t(16) = 1.21$, $p = 0.24$, $d = 0.36$, all remained unchanged.

3.1.5. Post to follow-up change

Post to follow-up analyses required that participants have both data points available. This was true for 36% of the sample (13 of 36 youth). Though under-powered, exploratory paired sample *t*-tests were calculated. Sexual health knowledge increased from post-test to follow-up, $t(12) = -0.286$, $p < 0.05$, $d = -0.90$. There were no other significant effects. Therefore, despite having opportunities to engage in risky behavior, there was no significant increase in risky behavior once youth had left the shelter for one month.

4. Discussion

Although national rates of teenage pregnancy have been decreasing steadily among the general population, rates among YFC remain disproportionate and stable (Dworsky & Courtney, 2010). Teen parenting - especially among vulnerable youth - initiates a life trajectory of decreased opportunities for educational and career success, which leads to perpetuating the cycle of poverty. Youth in foster care face life stressors that reflect pervasive poverty; inconsistent, harsh, or unavailable parenting; and high risk for substance abuse, violence, internalizing and externalizing disorders, and sexual risk-taking (Tarren-Sweeney, 2008). Currently available and empirically supported sexual health and pregnancy prevention programs are designed to increase knowledge about and access to contraception, a necessary but insufficient strategy for protecting YFC, whose unique needs reflect negative attitudes towards condoms, poor access to and insufficient information about condoms; ambivalence towards teen pregnancy and parenting; and vulnerability to co-occurring risk behaviors. Findings reveal promise for sexual health interventions tailored to these unique needs to increase sexual health knowledge, improve attitudes towards condoms and decrease sexual risk-taking. Satisfaction was high and outcome trends overall were positive. Improvements in sexual health knowledge maintained over time suggesting that youth left the shelter better informed about a range of topics including how to use condoms, STD transmission, and ways to reduce unwanted pregnancy. Improved attitudes towards condoms, though marginally significant, trended in the expected direction. Reductions in risky sexual behaviors from before youth arrived at the shelter to after they left were notable, suggesting that (at least for the youth retained at follow-up) once they returned to their communities, sexual risk taking had dropped to levels equivalent to those reported while at the shelter, where explicit rules and close supervision prohibit opportunities.

Despite dedicating almost an entire session to problem-solving, with active learning opportunities for role-plays that included practice with feedback, findings revealed no change in problem-solving skills, and no change in youth attitudes towards teen pregnancy or parenting. Youth acknowledged but minimized the challenges associated with becoming a teen parent, had a positive view of relatives and friends who became parents at a young age, and believed that becoming a teen parent would not interfere with their education or more distal life goals. This further confirms qualitative findings by Boustani, Frazier, Hartley, et al. (2015) and others (e.g., Connolly, Heifetz, & Bohr, 2012; Constantine, Jerman, & Constantine, 2009; Knight, Chase, & Aggleton, 2006; Love et al., 2005; Pryce & Samuels, 2010) who have reported that youth with poor family attachment tend to feel ambivalent about

Table 4
Mean scores across pre, post, and follow-up assessments.

	Pre (M, SD) (N = 36)	Post (M, SD) (N = 32)	FU (M, SD) (N = 17)
Sexual health knowledge[a,b,c,*]	6.5 (3.95)	10.34 (3.25)	13.12 (2.23)
Sexual risk-taking behavior[c,*]	3.19 (2.56)	2.34 (3.22)	2.41 (2.71)
Negative attitudes towards condoms	60.86 (15.95)	58.84 (17.43)	54.94 (14.33)
Attitudes towards teen pregnancy	29.31 (9.40)	28.00 (9.50)	28.35 (7.61)
Problem-solving	93.56 (20.37)	95.03 (23.52)	94.88 (26.76)
Attitudes towards teen parenting	58.61 (10.17)	58.38 (8.88)	55.29 (8.01)

* $p < 0.05$.
[a] Baseline to post-test.
[b] Post-test to follow-up.
[c] Baseline to follow-up.

becoming a teen parent. Although attitudes did not change, robust improvements in sexual health knowledge, and change in risky behaviors at follow-up are encouraging.

4.1. Challenges and opportunities in child welfare research

4.1.1. Recruitment

Obtaining consent for research in this population was especially challenging. We relied heavily on intake staff to find legal guardians and obtain required paperwork. Rewards (e.g., donuts, pizza) were offered to the intake team for every 10 consents completed. Despite these efforts, recruitment remained extremely difficult, resulting in only one-third of eligible shelter youth enrolling in the study, and 69 youth that participated in SiHLE-YFC but whose outcomes we could not assess. These consent and participation data highlight important questions regarding the potential risks and benefits of increased human subjects' protections for vulnerable populations. While it is imperative to protect our participants, especially vulnerable youth, increased protections may also interfere with learning what is necessary to improve quality and outcome of services for them. Securing consent for a child involved in foster care is far more complex than securing consent for other children in clinic, community- or school-based studies. It is not always clear who the legal guardian is, birth parents are often unavailable, children may be in the care of extended family, and case managers are sometimes reluctant to sign research consent, even if the child is under their custody. Unfortunately, difficulties associated with recruitment and retention of these families discourages researchers from pursuing research with such vulnerable groups, systematically under-represents or excludes them, restricts sample sizes, and severely limits what we learn about how best to serve them.

4.1.2. Welfare-involved youth are mobile and vulnerable

Beyond the complexities associated with recruitment and informed consent, the high mobility of YFC led to loss of more than half of the sample at follow-up. Anticipating this challenge, we had collected at baseline multiple types of contact information that enabled us to reach the youth that we did. Among the 19 youth lost at follow-up, 58% (11 youth) were unreachable (change of contact information, wrong contact information, no response, etc.); 27% (1 youth and 2 parents) refused to complete follow-up questionnaires over the phone; 27% (3 youth) were placed in group homes or with relatives for which no contact information was available; 9% (1 youth) was sent to a juvenile justice residential setting; and 9% (1 youth) was reportedly "on the run". These data highlight the constant mobility and tremendous vulnerability of YFC that limit their exposure to lengthy and complex interventions, and highlight our obligation to provide generalizable skills via brief and targeted psychoeducation, modeling, and role play. A rich and growing literature reveals a small set of common elements to evidence-based prevention programs – problem-solving, communication, assertiveness, and insight building – that may represent these "biggest bang for buck" intervention tools (Boustani, Frazier, Becker et al., 2015).

4.2. Limitations

Findings should be interpreted with caution in light of several methodological limitations. First, this was an open trial design with no comparison group, reflective of the Phase 8 pilot test in the context of the ADAPT-ITT framework (see Table 2). Although we considered randomizing youth to experimental versus comparison conditions, we deferred to shelter leadership who preferred that all youth participate together in SiHLE, which replaced their previous routine group therapy time. Future randomized trials will provide a more rigorous examination of intervention impact.

Second, data were based on self-report, reflecting the nature of the research questions focused on knowledge, attitudes, and risk behaviors. In future work, biological samples could more accurately identify pregnancies and STDs in long-term follow-ups.

Third, the sample size was small and unique to this setting, hence results may not be generalizable to other settings and locations. Furthermore, follow-up data were collected for only one-month post-discharge from the shelter, and obtained for only half of the sample. Results suggest that pre- to post- and pre- to follow-up analyses were sufficiently powered to detect effects, and reductions in risky behavior over time are promising, however should be interpreted with caution given the high attrition at follow-up, and the small and unique sample represented in this study.

Fourth, as described in the results section, due to limited resources and shelter requirements to provide services to all youth, 36% of the sample completed the intervention more than once. To address boredom and poor engagement among youth who had extended stays at the shelter, we offered them the opportunity to assist as informal peer facilitators. They modeled skills, distributed materials and often were active in group discussions and activities. Anecdotally, youth expressed a great deal of enthusiasm for this role, reflecting an extensive literature regarding the opportunities and benefits to peer assisted learning (e.g., Mathur & Rutherford, 1991). Yet, this also introduced some confounds in the data. A future iteration of the program could control for this confound, while leveraging the peer-assisted learning opportunity by formalizing the process via brief training that may allow youth to further spread sexual health knowledge to their community and peers, reflecting a literature on consumer-delivered services to expand the continuum of care from highly specialized trained individuals to lay workers and consumers (Kelly, 2004; Salzer, 2002).

4.3. Future directions and conclusions

Much work remains in order for teen pregnancy rates among YFC to drop to levels comparable to their peers in the community. Several evidence-based and skill-focused programs are available, relying on cognitive-behavioral principles, emphasizing sexual risk reduction, delivered in small groups, and including multiple sessions (Rotheram-Borus et al., 2009). The current findings suggest they can be adapted successfully for vulnerable youth, delivered in a shelter setting, favorably received, and effective at increasing sexual health knowledge, improving attitudes towards condoms, and reducing sexual risk-taking.

Three high priority avenues for future research are suggested: 1) Consider how best to integrate, teach and measure change in core skills, such as problem-solving, communication, and insight building; 2) Improve strategies for addressing the frequently cited ambivalence towards teen pregnancy which puts so many YFC at higher risk for teen parenting; and 3) Develop internal capacity of welfare youth serving agencies so that indigenous staff can select and deliver evidence-based interventions effectively, sustain them over time, and collect their own data with which to evaluate their youth outcomes and inform ongoing improvements.

Acknowledgement

We would like to thank Dr. Ralph DiClemente and his team for their support throughout this project.

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