



HHS Public Access

Author manuscript

Am J Prev Med. Author manuscript; available in PMC 2023 August 09.

Published in final edited form as:

Am J Prev Med. 2018 November ; 55(5): 736–746. doi:10.1016/j.amepre.2018.08.001.

Clinic-Based Programs to Prevent Repeat Teen Pregnancy: A Systematic Review

Brittini N. Frederiksen, MPH, PhD¹, Maria I. Rivera, MPH², Katherine A. Ahrens, MPH, PhD¹, Nikita M. Malcolm, MPH³, Anna W. Brittain, MHS², Julia M. Rollison, MPH, PhD³, Susan B. Moskosky, MS¹

¹Office of the Assistant Secretary for Health, Office of Population Affairs, HHS, Rockville, Maryland

²Division of Reproductive Health, Centers for Disease Control and Prevention, Atlanta, Georgia

³Atlas Research, Washington, District of Columbia

Abstract

Context: The purpose of this paper is to synthesize and evaluate the evidence on the effectiveness of repeat teen pregnancy prevention programs offered in clinical settings.

Evidence acquisition: Multiple databases were searched for peer-reviewed articles published from January 1985 to April 2016 that included key terms related to adolescent reproductive health services. Analysis of these studies occurred in 2017. Studies were excluded if they focused solely on sexually transmitted disease/HIV prevention services, or occurred outside of a clinic setting or the U.S., Canada, Europe, Australia, or New Zealand. Inclusion and exclusion criteria further narrowed the studies to those that included information on at least one short-term (e.g., increased knowledge); medium-term (e.g., increased contraceptive use); or long-term (e.g., decreased repeat teen pregnancy) outcome, or identified contextual barriers or facilitators for providing adolescent-focused family planning services. Standardized abstraction methods and tools were used to synthesize the evidence and assess its quality. Only studies of clinic-based programs focused on repeat teen pregnancy prevention were included in this review.

Evidence synthesis: The search strategy identified 27,104 citations, 940 underwent full-text review, and 120 met the adolescent-focused family planning services inclusion criteria. Only five papers described clinic-based programs focused on repeat teen pregnancy prevention. Four studies found positive ($n=2$) or null ($n=2$) effects on repeat teen pregnancy prevention; an additional study described facilitators for helping teen mothers remain linked to services.

Address correspondence to: Brittini N. Frederiksen, MPH, PhD, U.S. Office of Population Affairs, 1101 Wootton Parkway, Suite 700, Rockville MD 20852. brittini.frederiksen@hhs.gov.

No financial or other disclosures of conflicts of interest were reported by the authors of this paper.

THEME NOTE

This article is part of a theme issue entitled Updating the Systematic Reviews Used to Develop the U.S. Recommendations for Providing Quality Family Planning Services, which is sponsored by the Office of Population Affairs, U.S. Department of Health and Human Services.

SUPPLEMENTAL MATERIAL

Supplemental materials associated with this article can be found in the online version at <https://doi.org/10.1016/j.amepre.2018.08.001>.

Conclusions: This review identified clinic-based repeat teen pregnancy prevention programs and few positively affect factors that may reduce repeat teen pregnancy. Access to immediate postpartum contraception or home visiting programs may be opportunities to meet adolescents where they are and reduce repeat teen pregnancy.

Theme information: This article is part of a theme issue entitled Updating the Systematic Reviews Used to Develop the U.S. Recommendations for Providing Quality Family Planning Services, which is sponsored by the Office of Population Affairs, U.S. Department of Health and Human Services.

CONTEXT

Despite declines in the teen birth rate over the past 25 years, there were 209,809 births to teens aged 15–19 years in the U.S. in 2016, of which 17% were non-first births.¹ Repeat teen pregnancy (RTP) and repeat teen birth rates are higher among females within minority and low-income communities,^{1–3} and vary by state, as does effective postpartum contraceptive use.⁴ Repeat teen births have a higher preterm and low birthweight risk compared with first teen births.^{5–7} Repeat teen births are also at increased risk of adverse social outcomes, such as lower maternal educational attainment⁸ and dependence on government assistance,⁹ exacerbating socioeconomic disadvantages brought on by a first teen birth. Interventions to reduce repeat teen births may differ from those focused on primary prevention of teen pregnancy.^{8,10–13} Evidence-based approaches are needed to reduce repeat teen births, including clinic-based interventions, which can be implemented along with other family planning and related reproductive health services.^{3,14,15}

Previous systematic reviews of RTP prevention programs have not focused exclusively on clinic-based interventions¹⁴ or have been conducted many years ago.^{3,16–18} An updated review of clinic-based interventions, which can be integrated into other clinical care services, is needed. Therefore, as part of a broader review related to adolescent family planning services, a systematic review was conducted on the effect of clinic-based RTP programs on short-, medium-, and long-term outcomes among teens, as well as on identifying contextual barriers or facilitators for providing clinic-based RTP programs. This review was conducted in two phases: the first was not published but used to inform the development of Providing Quality Family Planning Services: Recommendations of CDC and the U.S. Office of Population Affairs¹⁵; the second was recently conducted to update the first review and capture the most recent evidence.

EVIDENCE ACQUISITION

The methods for conducting the first systematic review, covering studies published from January 1, 1985, to February 28, 2011, were based on methodology used by the U.S. Preventive Services Task Force (USPSTF).¹⁹ The updated systematic review, covering studies published from March 1, 2011, to April 30, 2016, followed the same process. The analysis for the initial and updated systematic reviews took place in 2014 and 2017, respectively. Six key questions (KQs) on adolescent-focused family planning services were identified by an expert work group convened to advise the Office of Population Affairs and the Centers for Disease Control and Prevention on the structure

and content of the Quality Family Planning recommendations (Table 1), and four priority topic areas were identified for later categorization of studies: youth-friendly services, confidentiality, parental involvement, and RTP prevention. This manuscript focuses on the studies categorized as pertaining to RTP prevention. An analytic framework was developed to show the hypothesized relationships between the provision of adolescent-focused family planning interventions among young people (ages 10–24 years) and key outcomes of interest (Figure 1). Specific outcomes included short-term outcomes (i.e., psychosocial, client experience [KQ3]), medium-term outcomes (i.e., behavioral [KQ2]), and long-term outcomes (i.e., reproductive health, value/cost savings [KQ1]); barriers and facilitators for clinics implementing interventions to strengthen adolescent-focused family planning services (KQ4); unintended consequences associated with adopting or implementing interventions designed to strengthen adolescent-focused family planning services (KQ5); and contextual barriers and facilitators for clients seeking (or clinicians providing) adolescent-focused family planning services (KQ6). Select key outcomes were added to the updated review (Figure 1).

Selection of Studies

Search terms for the concepts of “family planning” and “adolescent” were combined and used to query 16 online databases for the first review and 15 for the updated review (Appendix Table 1, available online). Slight modifications of search terms were incorporated into this updated systematic review based on limitations identified from the first review in order to optimize retrieval of relevant articles (Appendix Table 2, available online; new items bolded).

Criteria for retrieval and inclusion were established a priori and applied to the search results. Studies were initially considered for inclusion if they were conducted in highly developed nations including the U.S., Canada, Australia, New Zealand, and European countries categorized as “very high” on the Human Development Index; and written in English, Danish, Norwegian, or Swedish languages.

Full-length articles were then retrieved and included if their titles and abstracts suggested relevance to the KQs, as determined using population, intervention, comparator, outcome, timing, and setting (PICOTS) inclusion and exclusion criteria (Appendix Table 3, available online). For KQs 1–5, inclusion criteria required that the study examined an intervention (e.g., clinical or community-based service, strategy, program, practice, activity, or treatment) implemented to improve adolescent-focused family planning services, and had a comparator or control group to which the intervention was compared. The comparison group could consist of no intervention, usual care, or a different intervention and could be conducted using a contemporaneous or pre–post comparison design. Descriptive studies, without interventions or comparison groups, were only considered for KQ6, which focused on identifying the contextual barriers and facilitators for clients seeking (or clinicians providing) adolescent-focused family planning services. After verifying accuracy and completeness of the abstraction process through pilot testing, data from included studies were systematically abstracted into a structured, Excel-based abstraction form tailored to this topic area (data abstraction form available upon request).

Assessment of Study Quality and Synthesis of Data

The included studies were assessed for study quality. Internal validity was assessed by determining the USPSTF level of evidence (I, II-1, II-2, II-3, III) as well as identifying major study strengths, weaknesses, and risks for bias. External validity was assessed by comparing the study population with U.S. adolescents.

EVIDENCE SYNTHESIS

The combined results of the two systematic reviews, covering studies published from January 1, 1985, to April 30, 2016, identified and screened 27,104 unique records by title and abstract. After screening, 26,164 records were excluded because they met at least one exclusion criteria (PRISMA diagram Figure 2), primarily because they were studies conducted outside the relevant countries, unrelated to young people, or unrelated to family planning. Of the 940 full-text articles reviewed, 825 were excluded, primarily because they were studies focused solely on sexually transmitted disease/HIV prevention services without a family planning component, or were conducted outside of a clinic setting. This left 120 studies that met the inclusion criteria for the topic of adolescent-focused family planning services. After categorizing studies by the four priority topic areas previously identified, 17 studies were found to pertain to RTP prevention programs. Of the 17 studies, 12 focused on a diverse set of community-based programs, mostly operated in educational or home visiting settings. Because the aim of this review was to examine clinic-based programs focused on RTP prevention, the aforementioned 12 studies were excluded. The remaining five studies reporting on clinic-based RTP prevention programs comprise the evidence used for this review.

Clinic-Based Repeat Teen Pregnancy Studies Included

The five studies on clinic-based RTP prevention programs are presented in Appendix Table 4 (available online). Study sample sizes ranged from 243 to 1,386 participants. All participants were adolescent females under age 20 years. One study had a USPSTF Level I quality rating (properly powered and conducted RCT)²⁰; one study had a USPSTF Level II-1 quality rating (well-designed controlled trial without randomization)²¹; and two studies had a USPSTF Level II-2 quality rating (evidence obtained from well-designed cohort or case-control analytic studies).^{22,23} Lastly, one study was a time series study without a control group (USPSTF Level II-3 quality rating).²⁴

A controlled trial without randomization was conducted by Elster et al.²¹ that compared 125 pregnant teens who entered the Teen Mother and Child Program at University of Utah School of Medicine with 135 similar teens who came to the Salt Lake City County Health Department for Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) services. The Teen Mother and Child Program was a comprehensive adolescent pregnancy and parenthood program where pregnant teens received an in-depth psychosocial and nutritional assessment at program entry, during late gestation, and 6, 12, 18, and 26 months after delivery. In addition, the program provided medical care and other services, including education about pregnancy, labor and delivery, contraception, and infant health; individual counseling about interpersonal relationships, financial management, school and

work, parenting, and stress and coping; and couple and family counseling. Efforts were made to involve the adolescents' parents and the babies' fathers. Program staff were available nights and weekends for telephone assistance.

Rabin and colleagues²² conducted a retrospective cohort study in a hospital center in South Jamaica, New York, examining a program where 498 pregnant adolescents were assigned to an interdisciplinary team (consisting of obstetrician/gynecologists, pediatricians, social workers, and health educators) for the duration of their prenatal care and until age 20 years; outcomes were compared with those for 91 pregnant teens seen at the hospital center's adult obstetric clinic who continued to receive care with their newborns at the hospital's adult family planning and pediatrics clinics until age 20 years. Vital components of the program included a physician/practitioner 24-hour on call system and a reproductive health and family education program, consisting of ongoing biweekly classes for the patient, her partner, and family. Other services provided through the program included referrals to a mental health center, WIC services, a housing office, a high school equivalency program, a child care center, and an adult and pediatric primary care clinic.

O'Sullivan and Jacobsen²⁰ conducted an RCT of 243 adolescent mothers in a large teaching hospital in the Eastern U.S. to test the effectiveness of a special healthcare program for adolescent mothers and their infants ($n=120$) compared with a control group of adolescent mothers who received routine well-baby care ($n=123$). The intervention was administered at well-baby visits at eight timepoints (i.e., 2 weeks, 2, 4, 6, 9, 12, 15, and 18 months). A social worker provided family planning and parenting counseling, whereas a pediatrician and nurse practitioner provided additional family planning counseling, as well as education about infant care. If mothers missed appointments, they were urged to reschedule and sent frequent reminders.

Setzer et al.²³ conducted a cohort study with 339 adolescent mothers, half of whom received reproductive health services at a comprehensive, school-based clinic (intervention group) and the other half at a local family planning and prenatal care clinic (control group). The comprehensive, school-based clinic services to pregnant and parenting adolescents included pregnancy and sexually transmitted infection testing, obstetric screening, nutrition counseling, WIC services, prenatal care, participation in a parenting education program, postpartum family planning referrals, and some primary care services.

Finally, Omar and colleagues²⁴ conducted a time series study via retrospective chart review with 1,386 teen mothers who participated in the Young Parent Program at a university-based health center in Lexington, Kentucky. The Young Parent Program involved comprehensive care for both the teen mother and her baby, including prenatal and postnatal care, preventive care, reproductive health services, mental health, and acute care visits. Family counseling and similar services were also provided to siblings of the teen. Patients were seen by the same staff and attending physicians at each visit and the treatment team included physicians, nurses, a social worker, a nutritionist, and a psychologist, all of whom were available to provide care at each visit. An evening clinic was available to accommodate teens attending school or work during the day. Patients without health insurance were given free contraceptives and a "no charge" clinic visit. Extensive contraceptive counseling was

provided prior to the start of contraceptive use and at every clinic visit. Patients also received routine telephone and mail reminders of appointments.

Outcomes

Four of the studies with an intervention and comparison group addressed KQ1, whether there was any relationship between the program and improved long-term outcomes. Specifically, the four studies all addressed whether the program decreased RTP and each found lower incidence of RTPs in the intervention group, although the differences were only statistically significant in two of the studies (Table 2 and Appendix Table 4, available online). Elster et al.²¹ found 8% of the intervention group and 18% of the control group experienced a repeat pregnancy at 12 months, but this difference did not reach statistical significance ($p>0.05$). At 26 months, 29% of the intervention group and 39% of the control group experienced a repeat pregnancy, a difference that was also not significantly different ($p>0.05$). Rabin and colleagues²² found a smaller percentage of patients in the intervention group became pregnant again during adolescence over the 7 years of the program; 9% of the intervention group and 70% of the control group had an RTP before age 20 years. In the study by O'Sullivan and Jacobsen,²⁰ the RTP rate was 12% after 18 months compared with 28% in the control group ($p<0.003$). Finally, in the study by Setzer et al.,²³ repeat delivery was the reproductive outcome of interest, rather than a repeat pregnancy, which is a limitation as it misses the large percentage of adolescent pregnancies resulting in fetal loss or abortion. The repeat delivery rates during the 24-month period from the index birth were lower in the school-based intervention group compared with the local family planning and prenatal care clinic group (19% vs 28%), but this difference was not significant.

Two studies reported on KQ2, whether there was any relationship between the program and improved medium-term outcomes. Rabin and colleagues²² found that contraceptive use was higher among intervention group participants than control participants (85% vs 22%, $p=0.001$). O'Sullivan and Jacobsen²⁰ found a greater proportion of mothers in the intervention group compared with the control group attended well-baby visits at 2 weeks (92% vs 76%, $p<0.01$); 6 months (63% vs 40%, $p<0.001$); and 18 months (40% vs 18%, $p<0.01$).

None of the studies reported on short-term outcomes. Omar et al.²⁴ addressed KQ6, describing facilitators for helping teen mothers remain linked to adolescent-focused quality family planning services: continuity of care through strong relationships between the teen mother and those working with her, using personnel trained to care for and counsel adolescents, flexibility to individualize the care approach, provision of effective counseling on contraceptive choice, and contraceptive education.

DISCUSSION

This systematic review identified five studies of clinic-based programs designed to prevent RTP. Four of these studies assessed long-term and medium-term outcomes and one study described facilitators for adolescent clients to remain linked to family planning services. Of the four studies that assessed outcomes,^{20–23} two studies found a positive impact on decreasing RTP and unintended pregnancy,^{20,22} one study found a positive impact on increasing contraceptive use,²² and two studies found a positive impact on increasing

use of family planning services or repeat/follow-up services.²⁰ In addition, two studies showed lower percentages of RTP or repeat teen delivery in their intervention group, but the differences did not reach statistical significance.^{21,23} This review uncovered relatively few interventions to prevent RTP in clinic settings and these were studied at least 20 years ago.

More recent literature on RTP includes interventions with a community-based or home visiting focus. A study by Katz and colleagues²⁵ involved randomized cell phone-based counseling to adolescent mothers. Adolescent parents may have difficulty attending appointments or remaining engaged, which may make telephone contact and home visits more effective. However, this intervention was not successful and the authors noted that getting teens to maintain consistent contact with their counselors required persistence.²⁵ A study by Salihu et al.,²⁶ which evaluated a Federal Healthy Start program in Florida that incorporated both home visits and community sessions for teen mothers, was also not successful in reducing RTP. Unlike these two studies, two fairly recent studies of comprehensive interventions did demonstrate positive effects.^{27,28} These comprehensive interventions were implemented in community settings and included a school-based program as well as family planning services; both interventions had a positive impact on repeat pregnancy rates through increased contraceptive use and access to services.^{27,28}

Recent studies of home visiting programs have also shown promising findings on medium- and long-term outcomes. Two recent home visiting studies did not show an effect on RTPs,^{29,30} but Cohen and colleagues²⁹ found provision of additional psychosocial support on top of usual midwifery care in clients' homes resulted in greater use of family planning services. In another study, the Minnesota Visiting Nurse Agency's Pregnant and Parenting Team Program found teen mothers served by their program were more likely to remain enrolled in, attend regularly, and graduate from school; have full-term pregnancies and babies with healthy birth weights; and obtain adequate prenatal care.³⁰ Nurse home visitation may work through relationship-focused, intensive case management, which Lewis et al.³¹ tested with college-educated case managers to deliver a resiliency-based developmental assets approach to low-income parenting adolescents. This involved a long-term, supportive relationship between the adolescent and case manager, consisting of minimum bimonthly contacts for up to 3 years expected to foster social support and use of birth control.³¹ Intensive case management participants were less likely to have a subsequent birth within 3 years compared with control group participants (WIC recipients attending adolescent health clinics; 16% vs 31%, $p=0.09$).³¹ Additionally, a series of studies evaluating the effects of comprehensive home visitation services found visits to the mother's home by a nurse improved birth spacing and reduced subsequent pregnancies,³²⁻³⁴ and a mentorship program involving home visits was also effective.³⁵

Although the majority of literature on RTP interventions encompasses community-based and home visiting interventions, less is known about RTP prevention interventions implemented in clinic settings. Research on clinic-based RTP prevention interventions may be limited because of the challenges to keep teens connected to and engaged in continuous care.³⁶⁻³⁸ Access to effective contraceptive methods has been shown to have the most impact on reducing RTP,³⁹ but clinic staff may also be able to take other steps to help motivate and support teens' efforts to prevent RTP. A recent RCT of a Motivational Interviewing

program called Teen Options to Prevent Pregnancy, published after the time frame of this systematic review, found an 18.1% absolute reduction in self-reported RTP and a 13.7% absolute increase in self-reported long-acting reversible contraception use in the intervention group relative to the control group.⁴⁰ The Teen Options to Prevent Pregnancy program included the following components: (1) personalized contraceptive counseling with nurses trained in Motivational Interviewing; (2) access to a part-time family planning clinic; (3) transportation assistance; and (4) social work assistance.⁴⁰ Clinic-based RTP prevention programs represent a unique opportunity for the provision of contraceptive counseling and methods, sexual health education, and education on healthy parenting behaviors and referrals for social services in the postpartum period.⁴¹ Lewin and colleagues⁴² demonstrated greater contraceptive use among teen parents through a patient-centered medical home intervention that provided family-centered primary care where the teen parents and children saw the same medical provider, usually during the same visit. Addressing family planning and well-child visits together provides an opportunity to reach new mothers and counsel them about contraception and provide contraceptive referrals and prescriptions.^{43,44}

This systematic review of RTP interventions focusing on clinical settings adds to other comprehensive reviews aimed at identifying effective RTP interventions in various service locations. Akinbami et al.⁴⁵ conducted a systematic review on comprehensive clinical programs for teenage mothers and their children from January 1980 to August 2000, and identified four studies, three of which are included in the current systematic review (Rabin and colleagues,²² Elster et al.,²¹ and O'Sullivan and Jacobsen²⁰). Three of the four studies demonstrated a significant reduction in RTP.⁴⁵

Klerman and colleagues¹⁸ conducted a comprehensive review of evaluated programs aimed at postponing additional pregnancies or births to teen mothers conducted in the U.S. from 1970 to 2002. They found 19 studies, with only four studies describing interventions conducted in medical settings^{20–23} and two showed positive results.^{20,22} The current systematic review identified these same four studies with the addition of the study by Omar et al.²⁴ Corcoran and Pillai¹⁷ conducted a meta-analysis on 16 intervention studies with control groups that evaluated the effect of teenage pregnancy and parenting programs on subsequent pregnancy rates. They found that interventions produced a 50% reduction in the odds of pregnancy compared with the control groups at the first follow-up period (around 19 months), but by the second follow-up (around 31 months), the effect was no longer significant.

A review by Lachance and colleagues¹⁴ found a number of strategies implemented to reduce RTPs (e.g., case management, home visitation, and clinic-based approaches), but many of these interventions are not rigorously evaluated, making it difficult to reach consensus on the most effective strategies. In 2017, a mixed-methods systematic review of interventions to eliminate repeat conceptions in teenagers identified home-based, community-based, and telephone interventions, but did not report on any clinic-based interventions.^{46,47} There was little or no evidence for the effectiveness or cost effectiveness of any of the interventions identified; however, they did find home-based interventions reduced subsequent births.^{46,47} They concluded that more theory-based, rigorously evaluated programs need to be developed to reduce unintended repeat pregnancy in female adolescents.^{46,47}

Finally, a recent systematic review identified 14 high-quality evaluations of interventions specifically designed to prevent rapid repeat pregnancy or birth among adolescents, which included the studies by O'Sullivan and Jacobsen²⁰ and Rabin et al.²² from this review.⁴⁸ Although not all of the interventions were conducted in the U.S. or in clinic-based settings, they found the following to reduce rapid repeat pregnancy: providing contraceptive education and services, monitoring contraceptive use, and involving partners and families; providing postpartum counseling and contraceptive services soon after delivery; helping adolescents plan for a subsequent pregnancy or contraceptive use; helping adolescents understand the role contraceptives can play in determining positive life outcomes; and mentoring, motivating, and goal setting.⁴⁸

RTP interventions often combine multiple strategies into comprehensive programs, which makes it difficult to identify the specific components of these interventions that result in the desired short-, medium-, and long-term outcomes.¹⁴ Additional research is needed to identify the specific components of comprehensive strategies in clinics that are most effective in reducing RTP, as well as an evaluation of their implementation.

Limitations

The studies included in this review have a number of limitations that should be considered. Only the study by O'Sullivan and Jacobsen²⁰ received a USPSTF Level I evidence rating because it was an RCT; however, this study had high attrition for both the experimental and control groups. The study by Elster and colleagues²¹ received a USPSTF Level II-1 evidence rating because it was a controlled trial; however, subjects were not randomly assigned to the intervention, which may bring into question the comparability of the groups. There was also high attrition in this study and the results may not be generalizable to populations other than urban, mostly white, relatively advantaged youth who participated in the study. The studies by Rabin et al.²² and Setzer and colleagues²³ received a USPSTF Level II-2 evidence rating because they were cohort studies. The study by Rabin et al.²² lacked information on the types of services received by the mothers in the comparison group and attrition was unknown. Finally, Omar and colleagues²⁴ received a USPSTF Level II-3 evidence rating because it was a multiple time series study that involved a retrospective chart review. There was no comparison group and the findings were not generalizable outside those participants who participated in the program for at least 3 years, because they were the only participants included.

Overall, these studies are fairly dated and may not be generalizable to contemporary youth. Interventions addressing the needs of teens who experience high rates of RTPs today may need to differ from those of the 1990s, and focus on increasing access to immediate postpartum contraception or home visiting programs that meet adolescents where they are. Interventions are still needed as U.S. teen pregnancy rates are substantially higher than in other western industrialized nations⁴⁹ and racial/ethnic and geographic disparities in teen birth rates persist.⁵⁰

CONCLUSIONS

This review demonstrates limited evidence regarding effective RTP prevention clinic-based interventions. Two of the five clinic-based studies identified through this systematic review reduced RTPs through comprehensive programs providing prenatal and postpartum care to teenagers using an interdisciplinary team of healthcare professionals. Interdisciplinary teams can provide a supportive environment for adolescents through close and sustained relationships and by connecting them to a range of preventive health services, including quality family planning services. Healthcare systems and organizations should consider implementing comprehensive programs with interdisciplinary teams, and engaging teenagers in a variety of settings, whether in their home, community, or in the clinic setting, to ensure they have access to quality family planning services and support soon after delivery. However, new approaches and research to address contemporary issues of RTPs in populations currently at risk are needed.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEDGMENTS

The contents of this manuscript are solely the responsibility of the authors and do not necessarily represent the official position of the Office of Population Affairs or the Centers for Disease Control and Prevention.

This manuscript was supported, in part, by a contract between the Office of Population Affairs and Atlas Research, Inc (HHSP233201500126I).

REFERENCES

1. Martin JA, Hamilton BE, Osterman MJ, Driscoll AK, Mathews TJ. Births: final data for 2015. *Natl Vital Stat Rep.* 2017;66(1):1.
2. Rigsby DC, Macones GA, Driscoll DA. Risk factors for rapid repeat pregnancy among adolescent mothers: a review of the literature. *J Pediatr Adolesc Gynecol.* 1998;11(3):115–126. 10.1016/S1083-3188(98)70130-5. [PubMed: 9704301]
3. Meade CS, Ickovics JR. Systematic review of sexual risk among pregnant and mothering teens in the USA: pregnancy as an opportunity for integrated prevention of STD and repeat pregnancy. *Soc Sci Med.* 2005;60(4):661–678. 10.1016/j.socscimed.2004.06.015. [PubMed: 15571886]
4. Gavin L, Warner L, O'Neil ME, et al. Vital signs: repeat births among teens—United States, 2007–2010. *MMWR Morb Mortal Wkly Rep.* 2013;62(13):249–255. [PubMed: 23552226]
5. Partington SN, Steber DL, Blair KA, Cisler RA. Second births to teenage mothers: risk factors for low birth weight and preterm birth. *Perspect Sex Reprod Health.* 2009;41(2):101–109. 10.1363/4110109. [PubMed: 19493219]
6. Santelli JS, Jacobson MS. Birth weight outcomes for repeat teenage pregnancy. *J Adolesc Health Care.* 1990;11(3):240–247. 10.1016/0197-0070(90)90356-7. [PubMed: 2358394]
7. Smith GC, Pell JP. Teenage pregnancy and risk of adverse perinatal outcomes associated with first and second births: population based retrospective cohort study. *BMJ.* 2001;323(7311):476. 10.1136/bmj.323.7311.476. [PubMed: 11532837]
8. Hoffman SD. Updating estimates of the consequences of teen child-bearing for mothers. In: Hoffman SD, Maynard RA, eds. *Kids Having Kids: Economic Costs and Social Consequences of Teen Pregnancy.* 2nd ed Washington, DC: Urban Institute Press; 2008:74–92.

9. Grogger J, Bronars S. The socioeconomic consequences of teenage childbearing: findings from a natural experiment. *Fam Plann Perspect.* 1993;25(4):156–161. 10.2307/2135923. [PubMed: 8405341]
10. Flanagan PJ, McGrath MM, Meyer EC, Garcia Coll CT. Adolescent development and transitions to motherhood. *Pediatrics.* 1995;96(2, pt 1):273–277. [PubMed: 7630683]
11. Catrone C, Sadler LS. A developmental model for teen-age parent education. *J Sch Health.* 1984;54(2):63–66. 10.1111/j.1746-1561.1984.tb08767.x. [PubMed: 6563313]
12. Sadler LS, Cowlin A. Moving into parenthood: a program for new adolescent mothers combining parent education with creative physical activity. *J Spec Pediatr Nurs.* 2003;8(2):62–70. 10.1111/j.1744-6155.2003.tb00188.x. [PubMed: 12875174]
13. Goesling B, Colman S, Trenholm C, Terzian M, Moore K. Programs to reduce teen pregnancy, sexually transmitted infections, and associated sexual risk behaviors: a systematic review. *J Adolesc Health.* 2014;54(5):499–507. 10.1016/j.jadohealth.2013.12.004. [PubMed: 24525227]
14. Lachance CR, Burrus BB, Scott AR. Building an evidence base to inform interventions for pregnant and parenting adolescents: a call for rigorous evaluation. *Am J Public Health.* 2012;102(10):1826–1832. 10.2105/AJPH.2012.300871. [PubMed: 22897541]
15. Gavin L, Moskosky S, Carter M, et al. Providing quality family planning services: recommendations of CDC and the U.S. Office of Population Affairs. *MMWR Recomm Rep.* 2014;63(RR-04):1–54.
16. O’Sullivan AL. Tertiary prevention with adolescent mothers: rehabilitation after the first pregnancy. *Birth Defects Orig Artic Ser.* 1991;27 (1):57–71. [PubMed: 2065211]
17. Corcoran J, Pillai VK. Effectiveness of secondary pregnancy prevention programs: a meta-analysis. *Res Soc Work Pract.* 2006;17(1):5–18. 10.1177/1049731506291583.
18. Klerman L. Another chance: preventing additional births to teen mothers. www.healthyeennetwork.org/wp-content/uploads/2014/05/Another-Chance-Preventing-Additional-Births-to-Teen-Mothers.pdf. Published 2004.
19. Tregear SJ, Gavin LE, Williams JR. Systematic review evidence methodology: providing quality family planning services. *Am J Prev Med.* 2015;49(2 suppl 1):S23–S30. 10.1016/j.amepre.2015.03.033. [PubMed: 26190844]
20. O’Sullivan AL, Jacobsen BS. A randomized trial of a health care program for first-time adolescent mothers and their infants. *Nurs Res.* 1992;41(4):210–215. [PubMed: 1408861]
21. Elster AB, Lamb ME, Tavaré J, Ralston CW. The medical and psychosocial impact of comprehensive care on adolescent pregnancy and parenthood. *JAMA.* 1987;258(9):1187–1192. 10.1001/jama.1987.03400090071036. [PubMed: 3626002]
22. Rabin JM, Seltzer V, Pollack S. The long term benefits of a comprehensive teenage pregnancy program. *Clin Pediatr (Phila).* 1991;30(5):305–309. 10.1177/000992289103000508. [PubMed: 2044340]
23. Setzer JR, Smith DP. Comprehensive school-based services for pregnant and parenting adolescents in West Dallas, Texas. *J Sch Health.* 1992;62 (3):97–102. 10.1111/j.1746-1561.1992.tb06027.x. [PubMed: 1619904]
24. Omar HA, Fowler A, McClanahan KK. Significant reduction of repeat teen pregnancy in a comprehensive young parent program. *J Pediatr Adolesc Gynecol.* 2008;21(5):283–287. 10.1016/j.jpjg.2007.08.003. [PubMed: 18794024]
25. Katz KS, Rodan M, Milligan R, et al. Efficacy of a randomized cell phone-based counseling intervention in postponing subsequent pregnancy among teen mothers. *Matern Child Health J.* 2011;15(suppl 1):S42–S53. 10.1007/s10995-011-0860-3. [PubMed: 21809218]
26. Salihu HM, August EM, Jeffers DF, Mbah AK, Alio AP, Berry E. Effectiveness of a Federal Healthy Start program in reducing primary and repeat teen pregnancies: our experience over the decade. *J Pediatr Adolesc Gynecol.* 2011;24(3):153–160. 10.1016/j.jpjg.2011.01.001. [PubMed: 21397532]
27. Schaffer MA, Jost R, Pederson BJ, Lair M. Pregnancy-free club: a strategy to prevent repeat adolescent pregnancy. *Public Health Nurs.* 2008;25 (4):304–311. 10.1111/j.1525-1446.2008.00710.x. [PubMed: 18666935]

28. Key JD, Gebregziabher MG, Marsh LD, O'Rourke KM. Effectiveness of an intensive, school-based intervention for teen mothers. *J Adolesc Health*. 2008;42(4):394–400. 10.1016/j.jadohealth.2007.09.027. [PubMed: 18346665]
29. Cohen D, Lises C, Williams WR, Brunsdon CF, Batstone T. Exploratory study to evaluate the provision of additional midwifery support to teenage mothers. *Public Health*. 2011;125(9):632–638. 10.1016/j.puhe.2011.06.008. [PubMed: 21855098]
30. Schaffer MA, Goodhue A, Stennes K, Lanigan C. Evaluation of a public health nurse visiting program for pregnant and parenting teens. *Public Health Nurs*. 2012;29(3):218–231. 10.1111/j.1525-1446.2011.01005.x. [PubMed: 22512423]
31. Lewis CM, Faulkner M, Scarborough M, Berkeley B. Preventing subsequent births for low-income adolescent mothers: an exploratory investigation of mediating factors in intensive case management. *Am J Public Health*. 2012;102(10):1862–1865. 10.2105/AJPH.2012.300914. [PubMed: 22897551]
32. Eckenrode J, Campa M, Luckey DW, et al. Long-term effects of prenatal and infancy nurse home visitation on the life course of youths: 19-year follow-up of a randomized trial. *Arch Pediatr Adolesc Med*. 2010;164(1):9–15. 10.1001/archpediatrics.2009.240. [PubMed: 20048236]
33. Olds D, Henderson CR Jr., Cole R, et al. Long-term effects of nurse home visitation on children's criminal and antisocial behavior: 15-year follow-up of a randomized controlled trial. *JAMA*. 1998;280(14):1238–1244. 10.1001/jama.280.14.1238. [PubMed: 9786373]
34. Olds DL, Eckenrode J, Henderson CR Jr., et al. Long-term effects of home visitation on maternal life course and child abuse and neglect: fifteen-year follow-up of a randomized trial. *JAMA*. 1997;278(8):637–643. 10.1001/jama.1997.03550080047038. [PubMed: 9272895]
35. Black MM, Bentley ME, Papas MA, et al. Delaying second births among adolescent mothers: a randomized, controlled trial of a home-based mentoring program. *Pediatrics*. 2006;118(4):e1087–e1099. 10.1542/peds.2005-2318. [PubMed: 17015500]
36. Raneri LG, Wiemann CM. Social ecological predictors of repeat adolescent pregnancy. *Perspect Sex Reprod Health*. 2007;39(1):39–47. 10.1363/3903907. [PubMed: 17355380]
37. Kogan MD, Leary M, Schaetzel TP. Factors associated with postpartum care among Massachusetts users of the Maternal and Infant Care Program. *Fam Plann Perspect*. 1990;22(3):128–130. 10.2307/2135644. [PubMed: 2379570]
38. DiBari JN, Yu SM, Chao SM, Lu MC. Use of postpartum care: predictors and barriers. *J Pregnancy*. 2014;2014:530769. 10.1155/2014/530769. [PubMed: 24693433]
39. Baldwin MK, Edelman AB. The effect of long-acting reversible contraception on rapid repeat pregnancy in adolescents: a review. *J Adolesc Health*. 2013;52(4 suppl):S47–S53. 10.1016/j.jadohealth.2012.10.278 [PubMed: 23535057]
40. Stevens J, Lutz R, Osuagwu N, Rotz D, Goesling B. A randomized trial of motivational interviewing and facilitated contraceptive access to prevent rapid repeat pregnancy among adolescent mothers. *Am J Obstet Gynecol*. 2017;217(4):423.e1–423.e9. 10.1016/j.ajog.2017.06.010.
41. Santelli JS, Lindberg LD, Finer LB, Singh S. Explaining recent declines in adolescent pregnancy in the United States: the contribution of abstinence and improved contraceptive use. *Am J Public Health*. 2007;97(1):150–156. 10.2105/AJPH.2006.089169. [PubMed: 17138906]
42. Lewin A, Mitchell S, Beers L, Schmitz K, Boudreaux M. Improved contraceptive use among teen mothers in a patient-centered medical home. *J Adolesc Health*. 2016;59(2):171–176. 10.1016/j.jadohealth.2016.04.007. [PubMed: 27448947]
43. Fagan EB, Rodman E, Sorensen EA, Landis S, Colvin GF. A survey of mothers' comfort discussing contraception with infant providers at well-child visits. *South Med J*. 2009;102(3):260–264. 10.1097/SMJ.0b013e318197fae4. [PubMed: 19204612]
44. Rosener SE, Barr WB, Frayne DJ, Barash JH, Gross ME, Bennett IM. Interconception care for mothers during well-child visits with family physicians: an IMPLICIT Network study. *Ann Fam Med*. 2016;14(4):350–355. 10.1370/afm.1933. [PubMed: 27401423]
45. Akinbami LJ, Cheng TL, Kornfeld D. A review of teen-tot programs: comprehensive clinical care for young parents and their children. *Adolescence*. 2001;36(142):381–393. [PubMed: 11572313]

46. Aslam RW, Hendry M, Booth A, et al. Intervention Now to Eliminate Repeat Unintended Pregnancy in Teenagers (INTERUPT): a systematic review of intervention effectiveness and cost-effectiveness, and qualitative and realist synthesis of implementation factors and user engagement. *BMC Med.* 2017;15(1):155. 10.1186/s12916-017-0904-7. [PubMed: 28806964]
47. Whitaker R, Hendry M, Aslam R, et al. Intervention Now to Eliminate Repeat Unintended Pregnancy in Teenagers (INTERUPT): a systematic review of intervention effectiveness and cost-effectiveness, and qualitative and realist synthesis of implementation factors and user engagement. *Health Technol Assess.* 2016;20(16):1–214. 10.3310/hta20160.
48. Norton M, Chandra-Mouli V, Lane C. Interventions for preventing unintended, rapid repeat pregnancy among adolescents: a review of the evidence and lessons from high-quality evaluations. *Glob Health Sci Bract.* 2017;5(4):547–570. 10.9745/GHSP-D-17-00131.
49. Sedgh G, Finer LB, Bankole A, Eilers MA, Singh S. Adolescent pregnancy, birth, and abortion rates across countries: levels and recent trends. *J Adolesc Health.* 2015;56(2):223–230. 10.1016/j.jadohealth.2014.09.007. [PubMed: 25620306]
50. Romero L, Pazol K, Warner L, et al. Reduced disparities in birth rates among teens aged 15–19 years—United States, 2006–2007 and 2013–2014. *MMWR Morb Mortal Wkly Rep.* 2016;65(16):409–414. 10.15585/mmwr.mm6516a1. [PubMed: 27124706]

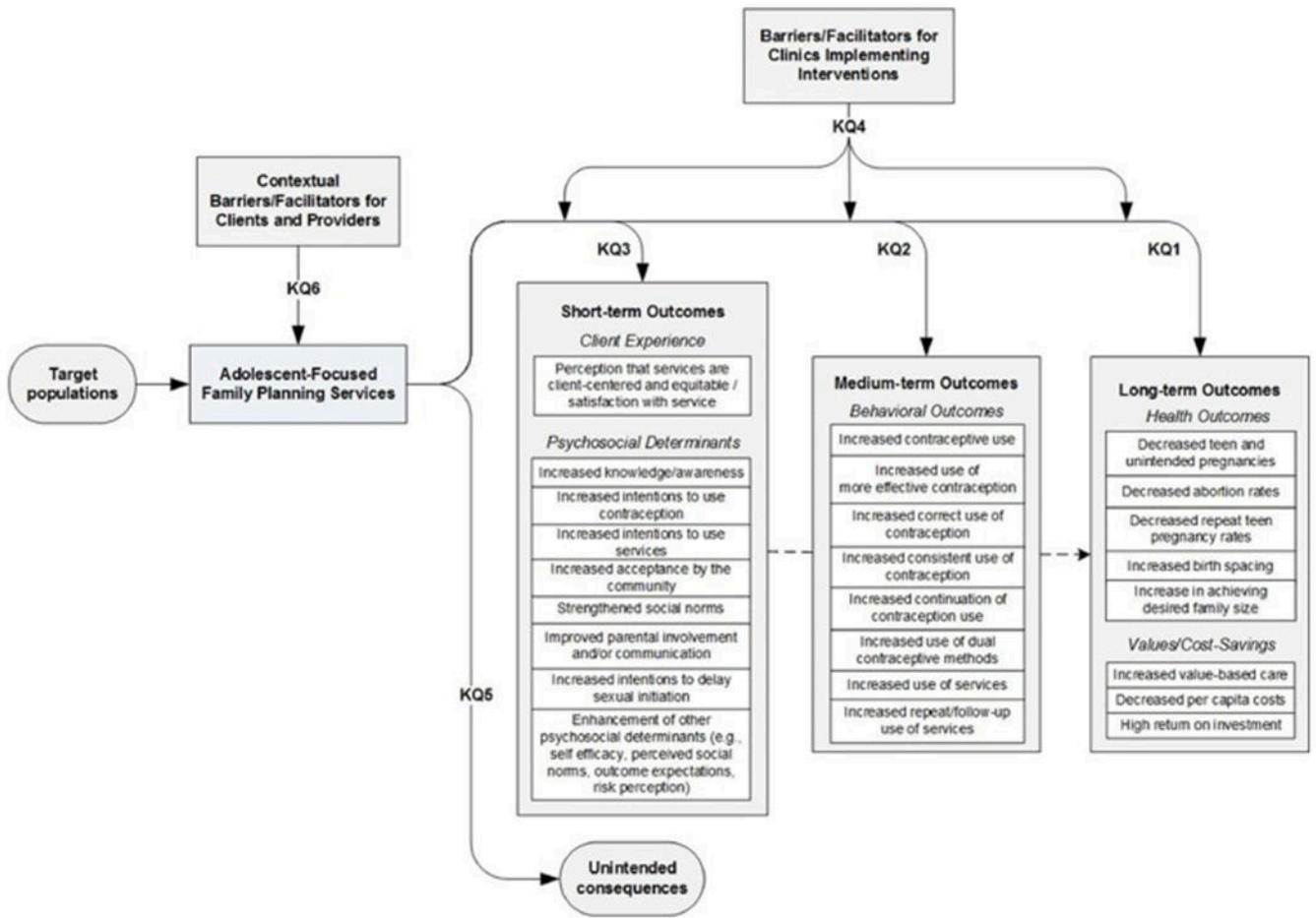


Figure 1. Adolescent-focused systematic review analytic framework.
^aIndicates a new outcome added to the updated review.
 KQ, key question.

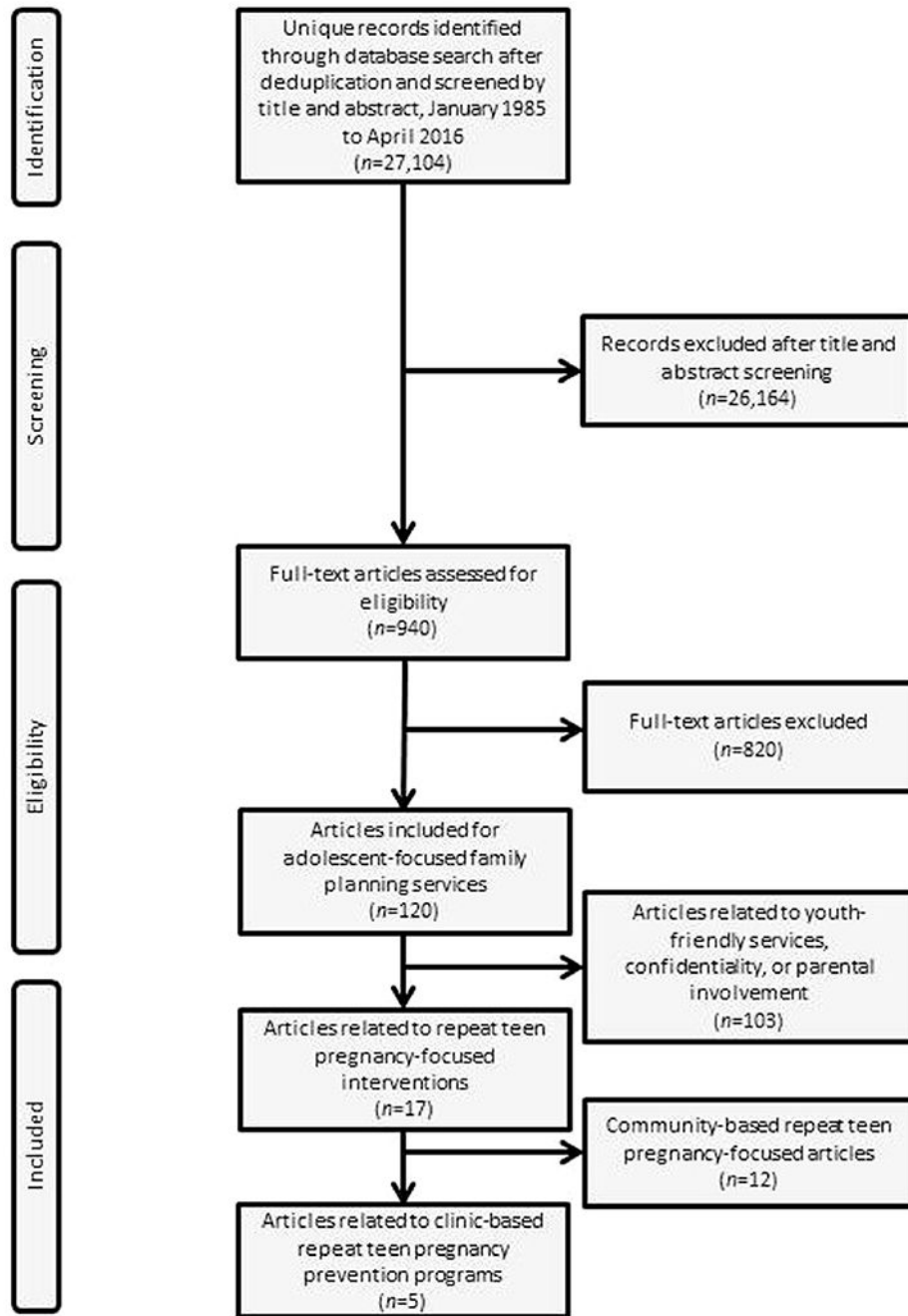


Figure 2. Repeat teen pregnancy PRISMA diagram.

Table1.

Adolescent-focused Key Questions (KQs)

KQ no.	Question
1	Is there a relationship between the provision of quality family planning interventions and improved long-term outcomes (e.g., decreased teen and unintended pregnancies, decreased abortion rates, decreased repeat teen pregnancy rates, increased birth spacing, increase in achieving desired family size, increased value-based care, decreased per capita costs, high return on investment) among adolescents/young adults?
2	Is there a relationship between the provision of quality family planning interventions and improved medium-term outcomes (e.g., increased contraceptive use, increased use of more effective contraception, increased correct use of contraception, increased consistent use of contraception, increased continuation of contraception use, increased use of dual contraceptive methods, increased use of services, increased repeat-follow-up use of services) among adolescents/young adults?
3	Is there a relationship between the provision of quality family planning interventions and improved short-term outcomes (e.g., perception that services are client-centered and equitable/satisfaction with service, increased knowledge/awareness, increased intentions to use contraception, increased intentions to use services, increased acceptance by the community, strengthened social norms, improved parental involvement and/or communication, increased intentions to delay sexual initiation, enhancement of other psychosocial determinants) among adolescents/young adults?
4	What are the barriers and facilitators for clinics in adopting and/or implementing interventions designed to strengthen adolescent/young adult quality family planning services?
5	Are there unintended consequences associated with adopting and/or implementing interventions designed to strengthen adolescent/young adult quality family planning?
6	What are the contextual barriers and facilitators for adolescent/young adult clients in seeking and/or remaining linked to adolescent/young adult quality family planning services, as well as for healthcare providers providing such services?

Table2.

Summary of Effects of Repeat Teen Pregnancy Prevention Program on Short-, Medium-, and Long-term Outcomes

Outcomes	Elster et al. (1987 ²¹)	Rabin et al. (1991 ²²)	Setzer et al. (1992 ²³)	O’Sullivan and Jacobsen (1992 ²⁰)
Long-term outcomes				
Decrease teen and/or unintended pregnancy				
Increase birth spacing				
Decrease abortion rates				
Decrease repeat teen and/or unintended pregnancy	↔	↑	↔	↑
Increase in achieving family size				
Increased value-based care				
Decreased per capita costs				
High return on investment				
Medium-term outcomes				
Increase contraceptive use		↑		
Increase use of more effective contraceptive				
Increase correct use of contraception				
Increase consistent use of contraception				
Increase continuation of contraception use				
Increase dual-method contraceptive use				
Increase use of family planning service				
Increase repeat/follow-up service use				↑
Change self-reported sexual behavior				
Short-term outcomes				
Perception that services are client-centered and equitable/satisfaction with service				
Quality/satisfaction with service				
Strengthen social norms				
Enhance other psychosocial determinants				
Increase intentions to use contraceptives				
Increase knowledge/awareness				
Improve parent involvement/communication				
Increase acceptance by the community				
Increase intentions to use service				
Increase intentions to delay sexual initiation				

Note: ↑ statistically significant positive impact on outcome; ↔ no evidence of an impact on outcome (inconclusive finding).

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript