

Initiation of Sexual Intercourse and Safe Sex Practices: An Evidence-Based Replication of “Reducing the Risk”

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Abstract

Purpose and Background: This study aimed to (1) identify predictors of initiation of sexual intercourse before program implementation, and (2) assess the one-year impact of *Reducing the Risk (RTR)* on the delay of sexual intercourse initiation and safe sex practices among a predominantly Latino sample of 9th graders in Tulare County. *RTR* is an evidence-based program designed to delay initiation of adolescent sexual intercourse, and increase safe practices among those who are already sexually active. The program was implemented in Tulare County; whose average teen birth rate for 2009-2011 was 60.2 per 1,000 teens aged 15-19. **Methods:** Baseline and one-year follow-up data were collected on 390 students, beginning in their 9th grade year (53% female, 72.2% Latino/Hispanic). Students participated in a school-based pregnancy prevention program (RTR) and answered questions on HIV/STIs knowledge, attitudes about abstinence and teen pregnancy, parent communication, sexual intercourse, and safe sex practices. **Results:** Over one in eight students were sexually active at baseline. Overall, students reported long-term increases in HIV/STI knowledge and parent communication, decreases in intentions to have sexual intercourse and positive attitudes about teen pregnancy. Controlling for baseline differences, sexually active students reported fewer positive attitudes about abstinence. **Conclusion:** *RTR* may be more effective in preventing pregnancy and HIV/STIs among students who are not yet sexually active. Further, *RTR* does appear to successfully impact students who have already initiated sexual intercourse decisions to practice safe sex; however, not to become abstinent.

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Introduction

Birth rates among 15-19 year-olds in the U.S. have declined by 8% between 2010 and 2011 with an incidence rate of 34.2 per 1,000 in 2010 down to 31.3 per 1,000 in 2011 (Centers for Disease Control and Prevention [CDC], 2013; California Department of Public Health [CDPH], 2013). Overall teen birth rates are similar in California, however; teen pregnancy continues to be a challenge for counties in inland rural areas. The average teen birth rate for 2009-2011 in Tulare County, California was 60.2 per 1,000 teens aged 15-19, compared to the 2011 U.S. and California rates of 31.3 and 28.0, respectively (CDPH, 2013).

Risk Factors for Teen Pregnancies and Live Births

Predictors of poverty, such as low levels of education and high levels of unemployment, may be largely responsible for high birth rates among young teenagers (Kirby, Coyle, & Gould, 2001; Perlman, Klerman, & Kinard, 1981). Tulare County is at especially high risk, as 23.8% of its residents have lived below the federal poverty level for at least five years, compared to 14.4% in the state of California (U.S. Census Bureau, 2013). Infants born to teen mothers are at higher risk of preterm birth and low-birth weight, and when the infants become children or adults, they are at higher risk of being incarcerated, in foster care, and living in continuous poverty (McKenzie et al., 2011).

Successful Intervention Approaches toward Teen Pregnancy

Since teen pregnancy increases the odds of adolescent mothers and their children living in continuous poverty (Kearney & Levine, 2012), state and federal level funding have been directed to comprehensive evidence-based teen pregnancy prevention programs (CDPH, 2012). Studies have shown that intervention programs are effective in reducing teen pregnancy in four unique ways. First, teen pregnancy prevention programs are effective in delaying the initiation of sexual intercourse (Markham et al., 2012; Zimmerman et al., 2008). More specifically, studies evaluating pregnancy prevention programs have found gender and racial and ethnic differences, where females (Markham et al., 2012), African Americans (Markham et al., 2012), and Hispanics (Kirby et al., 2004) who received the intervention were more likely to delay sexual intercourse compared to males and all other racial/ethnic groups.

Second, intervention programs have changed attitudes towards abstinence and safe sex practices among sampled populations. Markham et al. (2014) found that risk avoidance and risk reduction prevention programs were more likely to increase adolescents' positive attitudes and beliefs towards abstinence and about condom use. Additionally, Kirby et al. (2004) found that *Safer Choices*, a teen pregnancy prevention program aimed to delay the initiation of sexual intercourse and increase safe sex practices among sexually active teens, was more likely to affect males' decisions to use a condom compared to females (Kirby et al., 2004).

Third, intervention programs are successful in decreasing adolescent sexual risk behaviors. For example, in evaluating *Safer Choices*, Kirby et al. (2004) reported an increase in condom use among participants who reported engaging in unprotected sex at baseline. Similarly, East et al. (2003), found that male siblings who participated in the intervention program were more likely to use a contraceptive method compared to the control group (East et al., 2003).

Last, teen pregnancy prevention programs have been effective in changing the effects of interpersonal relationships on adolescents' protection methods. Studies have shown that there are social and psychological constraints related to adolescents' perceptions of abstinence and protection (East, Chien, & Barber, 2012; Sieving, 2013). Coyle et al. (2001) found that adolescents who participated in a teen pregnancy prevention program reported an increase in condom frequency and a decrease in related psychosocial barriers (i.e., barriers in condom use, negative attitudes about condoms, and self-efficacy to use condoms).

Reducing the Risk (RTR) Intervention

Reducing the Risk (RTR) was developed by Education, Training, and Research (ETR) Associates to reduce teen pregnancy and the transmission of sexually transmitted infections (STIs) and the human immunodeficiency virus (HIV) among high-school students. *RTR* uses the social learning, social influence, and cognitive-behavioral theories to teach students intrapersonal skills they can use to abstain from sexual intercourse and to prevent teen pregnancy and HIV/STIs. *RTR* presents both abstinence and condom use as the most effective methods to prevent teen pregnancy and HIV/STIs, with abstinence being the only 100% method.

Studies have shown that *RTR* is effective in delaying the initiation of sexual intercourse and changing at-risk teens' attitudes towards safe sex practices (Hubbard et al., 1998; Kirby et al., 1991; Zimmerman et al., 2008). For example, Kirby et al. (1991) found that students who participated in *RTR* reported a 24% reduction in sexual intercourse initiation at 18-month follow-up compared to the control group. Similar results were found in other studies that have evaluated *RTR* (Hubbard et al., 1998; Zimmerman et al., 2008). Also, *RTR* was effective in increasing knowledge about transmission of STIs and HIV among the sampled population (Hubbard et al., 1998; Kirby et al., 1991; Zimmerman et al., 2008) and condom and contraception use among participants who initiated sexual intercourse before baseline (Hubbard, Giese, & Rainey, 1998; Zimmerman et al., 2008). Lastly, *RTR* is

unique in that it increases parent-student communication surrounding the consequences of sexual intercourse (Kirby et al., 1991).

In 2010, Tulare Community Health Clinic received a five-year grant from the Office of Adolescent Health (OAH) to implement an evidence-based replication of *RTR* teen pregnancy prevention program in the cities of Tulare and Alpaugh, California. The Central Valley Health Policy Institute at the California State University, Fresno serves as the evaluator. The grant is currently in its third year of full implementation.

The Current Study

This study aimed to (1) identify predictors of initiation of sexual intercourse before program implementation (baseline), and (2) assess the one-year impact of *RTR* on the delay of sexual intercourse initiation and safe sex practices among a predominantly Latino sample of 9th grade in Tulare County. In California, Latinas represented 73.2% of births among all adolescents aged 15-19 (CDPH, 2011). To date, *RTR* has been implemented among majority white and black 9th and 10th grade students, with relatively few Latinos (Hubbard et al., 1998; Kirby et al., 1991; Zimmerman et al., 2008). Further, findings suggest that *RTR* is effective in delaying sexual intercourse among all students who had not initiated sexual intercourse at baseline (Hubbard et al., 1998; Kirby et al., 1991; Zimmerman et al., 2008), and increasing contraception use for lower-risk (Kirby et al., 1991) and black students (Zimmerman et al., 2008). Additionally, *RTR* increased contraception use among students who initiated sexual intercourse during the study period both in rural and urban communities (Hubbard et al., 1998). Differences in program outcomes in studies evaluating *RTR* have been attributed to variations in delivery of the curriculum, students' disruptive behaviors, and lack of mass media and video messaging (Zimmerman et al., 2008).

There is a dearth of information pertaining to the effectiveness of evidence-based teen pregnancy prevention programs, particularly programs focused on abstinence and safer sex practices for

youth who are already sexually active (Flaspohler, Lesesne, Puddy, Smith, & Wandersman, 2012; Lachance, Burrus, & Scott, 2012; Lavin & Cox, 2012; Sieving et al., 2013). This study will contribute to understanding effective teen pregnancy prevention strategies for a Latino-majority sample of students who transitioned from 9th grade to 10th grade in Tulare County, California.

Consistent with previous studies that have evaluated *RTR*, we assessed if the program had long-term impacts in students' knowledge, attitudes, and parent communication about abstinence, safe sex practices, and consequences of sexual intercourse (Hubbard et al., 1998; Kirby et al., 1991; Zimmerman et al., 2008). We also assessed if *RTR* delayed sexual intercourse among students who did not initiate sexual intercourse at baseline and increased safe sex practices among students who were sexually active at baseline (Hubbard et al., 1998; Kirby et al., 1991; Zimmerman et al., 2008). Therefore, this study hypothesized that *RTR* will positively change students' attitudes and behaviors pertaining to abstinence and safe sex practices, as well as increase parent-student communication regarding the consequences of sexual intercourse. Further, we hypothesized *RTR* would impact sexual activity status groups differently, where students who initiated sexual intercourse at baseline will have less program impact in attitudes about abstinence and teen pregnancy, HIV/STIs knowledge, and parent-student communication.

Current research shows that the majority (60.2%) of sexually active adolescents in the U.S. used a condom at last sexual encounter. As a result, this study hypothesized that sexually active students will report high condom use at baseline. Further, we expected to see an increase in safe sex practices among this population over the follow-up year.

Methods

Participants

Only students who attended one of two traditional high schools who received the *RTR* intervention were included in this study. There

were 751 ninth graders who participated in the program during the first year full implementation; 619 students were evaluated at pretest and 390 at one-year follow-up. This study was limited to the 390 students who were evaluated at pretest and one-year follow-up. Our sample was an adequate representation of students who participated in the program for the following reasons: (1) it represents 51% of all students who participated in the program, and (2) it represents a 63% return rate from pretest to one-year follow-up, and (3) t-test and chi-square tests revealed no significant differences between those who did and did not complete the one-year follow-up on baseline characteristics.

Measures

Sexual Intercourse Initiation. The initiation of sexual intercourse was measured by the question “Have you ever had sexual intercourse?” Sexual intercourse included vaginal, oral, and anal sex. Students who responded yes to this question were considered sexually active. This question was retrieved from the California Healthy Kids Survey Sexual Behavioral Model, Supplement 1 (WestEd for the California Department of Education [WestEd], 2014).

HIV/STIs Knowledge. Knowledge of HIV/STIs facts were measured by an 18-item scale with a Cronbach’s alpha = .75. The first stem of questions asked students if the following statements were “true” or “false,” students were also given the response option “unsure”: “A woman is protected from pregnancy the day she begins taking the pill,” “All STDs can be cured by taking medicine,” “A person with an STD who looks and feels healthy cannot give the infection to others,” “Some STDS put a person at higher risk of getting infected with HIV,” “About 1 out of 4 sexually active teenagers get an STD each year,” “The best way to use a condom is to leave some space at the tip for semen,” “A condom should be completely unrolled before it is place on the penis,” and “Pregnant women who are infected with HIV can pass the virus on to the baby before the baby is born.” The second stem of questions asked students if the following statements put them at-risk for HIV: “Sharing needles for tattooing and piercing,” “Having sex without a condom,”

“Donating blood,” “Using the same condom twice,” and “Hugging.” Students were given the response options “yes,” “no,” and “unsure.” The last stem question asked students if the following behaviors “protects from pregnancy and HIV/STD,” “protects from pregnancy only,” or “protects from neither,” : “Choosing not to have sex (abstinence),” “Using hormone based birth control (e.g., the pill, Depo-Provera shot, patch, vaginal ring),” “Using latex condoms,” “Using withdrawal (Pull-out method),” and “Douching (female vaginal rinse).” All items were transformed to capture the correct answer. Correct responses were added to create a total HIV/STIs knowledge score out of 18 items. These questions were retrieved from the *RTR* knowledge survey (ETR Associates, 2010).

Parent Communication. Parent communication was measured by a 6-item scale with a Cronbach’s alpha = .76. This scale asked students if they have talked with their parents about “What your parents think about teenagers having sex,” “Your questions about sex,” “Reasons why you shouldn’t have sex at your age,” “How your life would change if you became a father or mother while you’re a teenager,” “Birth control,” and “AIDS/HIV and other sexually transmitted diseases.” Response options were binary, “yes” or “no.” These questions were adapted from the California Healthy Kids Survey Sexual Behavioral Model Supplement 1 (WestEd, 2014).

Attitudes about Abstinence and Teen Pregnancy. Two questions measured students’ attitudes surrounding abstinence and teen pregnancy: (1) “For teens your age, abstinence (not having sexual intercourse) is a better choice than having sexual intercourse?,” and (2) “For some teens under 18 years old, it is a good decision to have a baby.” Response options included, “very much agree,” “agree,” “disagree,” and “very much disagree.” Responses were transformed to measure positive attitudes about abstinence and negative attitudes about teen pregnancy. These questions were also adapted from California Healthy Kids Survey Sexual Behavioral Model Supplement 1 (WestEd, 2014).

Intentions to have Sexual Intercourse.

Intentions to engage in sexual intercourse within the next year were measured by the question “How likely do you think it is that you will choose to have sexual intercourse one or more times in the next year?” Students were given five response options; “very likely,” “likely,” “unsure,” “unlikely,” and “very unlikely.” This item was transformed where 1 = very likely/likely to have sexual intercourse within the next year and 0 = unsure, unlikely, and very unlikely. These questions were also adapted from California Healthy Kids Survey Sexual Behavioral Model Supplement 1 (WestEd, 2014).

Safe Sex Practices. Safe sex practices were assessed using two measures. First, “The last time you had sexual intercourse; did you or your partner use a condom?” Response options included, “yes” and “no.” Second, “The last time you had sexual intercourse, what one method did you or your partner use to prevent pregnancy (mark all that apply)?” The response options were “no method,” “birth control pills,” “condoms,” “Depo Provera or other injectables,” “withdrawal,” “some other method,” or “not sure.” This item was recoded to reflect contraception use. These questions were adapted from California Healthy Kids Survey Sexual Behavioral Model Supplement 1 (WestEd, 2014).

Procedures

A quasi-experimental phased cohort longitudinal design is being used to collect data over a five-year period (2011-2015). Pretest and follow-up data, collected in 2011 and 2012, were used for this study to assess one-year program impacts of *RTR*. The program aimed to service 800-1200 high-school students during the first year of full implementation. Students and their parents were given three options when consenting/assenting to the program: (1) consent to both the program and evaluation (2) consent to the program only or (3) will not consent to the program or evaluation. An information session was held to inform parents about the content being covered in *RTR* prior to implementation. Consent forms were then distributed to students through their physical education course. Evaluators received

signed consent forms prior to program implementation. The data of only those students who had their assent and their parents’ consent to participate in both the program and the evaluation were analyzed for this study.

A comprehensive hiring process took place to select qualified facilitators for the program. Facilitators consisted of nurse practitioners, counselors, and health educators. Selection was based upon prior experience with adolescents and sexual health education. All facilitators were trained on the *RTR* curriculum by ETR Associates. Facilitators were solely responsible for teaching the curriculum and had no relation with program evaluation. The original 16 lessons of *RTR* was adapted and taught in eight sessions, where two lessons were taught in a one hour and 50-minute class session. The sessions were implemented twice a week over four-week time period to cover the 16 lessons. The human subjects review board at Fresno State University approved this study.

Description of Intervention

RTR is a 16-lesson series which focuses on changing students’ attitudes towards abstinence and protection through facts, refusal skills, and delay tactics. During lesson 1, a safe environment is established through ground rules and teen pregnancy facts. The remaining lessons begin with a recap of the previous lesson and activities to dispel myths about teen pregnancy and HIV/STIs and skills to resist pressure. Each lesson ends with a lesson summary addressing skills and facts learned.

Analytic Plan

Dependent t-tests were used to measure long-term program impacts. Independent samples t-tests and chi-square tests were used to analyze differences in program impacts by sexual activity status (i.e., initiated sexual intercourse versus those who had delayed sexual intercourse) at baseline during two points in time, pre and follow-up tests. Additionally, analyses of covariance (ANCOVAs) were used to assess if there were differences in attitude change regarding abstinence and teen pregnancy, HIV/STIs knowledge, and parent

communication, controlling for baseline characteristics associated with the outcome.

Results

A total of 390 students were included in this study, approximately 47% were male and 72% reported Latino/Hispanic as their race/ethnicity. Only 20% of students reported that their mother had less than a high school education, and 32.8% reported that they did not expect to attend a four-year college (see Table 1). Students reported a relatively low level of parent communication ($M = 2.7$ out of 6, $SD = 1.91$) regarding the consequences of having sexual intercourse, and high previous knowledge about HIV/STIs facts, including protection ($M = 11.3$ out of 18 facts, $SD = 2.64$). Additionally, students reported positive attitudes about abstinence (84.4%) and negative attitudes about teen pregnancy (97.4%). Lastly, 13.4% of the students reported initiation of sexual intercourse (i.e., vaginal, anal, and oral) prior to baseline and 12.5% had intentions to initiate sexual intercourse within the next year.

Sexual Initiation Group Differences on Baseline Characteristics

Table 1 indicates that there were differences between those who had initiated sex at baseline and those who had not on gender, college expectancy, attitudes about abstinence, and intention to initiate sexual intercourse. Students who had initiated sexual intercourse were more likely to be male (61%) and to intend to have sexual intercourse within the next year (55%) compared to students who delayed sexual intercourse prior to baseline. Students who had initiated sexual intercourse were also less likely to expect to attend a four-year college, and had fewer positive attitudes about abstinence compared to students who delayed sexual intercourse. There were no differences found between the two groups in race/ethnicity, mother's education, parent communication, HIV/STIs knowledge, and attitudes about teen pregnancy. See Table 1.

Table 1

Differences between Pretest, Posttest, and One-Year Follow-Up Data of the Total Population, Students who Initiated Sexual Intercourse, and Students who Delayed Sexual Intercourse

	Pretest		One-Year Follow-Up	
	Initiated Sex (n=51)	Delayed Sex (n= 329)	Initiated Sex (n =51)	Delayed Sex (n= 329)
<i>Baseline Characteristics</i>				
Gender (male)	61%*	44%	-	-
Ethnicity (Hispanic)	78%	72%	-	-
Mother's Education	25.50%	20.40%	-	-
College	47.1%*	29.50%	-	-
Sexually Active	-	-	-	15.50%
<i>Intervention Outcomes</i>				
Parent Communication (0-6)	2.6 (1.95)	2.8 (1.88)	2.8 (2.24)	3.00 (2.19)
STI/HIV Knowledge (0-18)	11.8 (2.93)	11.2 (2.56)	13.9 (3.07)	14.0 (2.57)
Positive Attitude toward Abstinence	62.80%	88.5%*	62.8% Ψ	89.7%*
Negative Attitude toward Teen Pregnancy	96.10%	97.60%	95.70%	93.90%
Sex Intent	55%*	7.10%	47.8%*	15.20%
<i>Safe Sex Practices</i>				
Condoms	48.30%	-	70%	56.30%
Contraception including Condoms	70.40%	-	80%	59.20%

Note: * ≤ 0.05 in Dependent-T Test, Chi-Square or Independent-T Test at one-year follow-up, $\Psi \leq 0.05$ in Chi-square or Independent-T Test at posttest. Outcome measures represent dependent-t test between pretest and one-year following.

Changes in Outcomes by Sexual Initiation Status

Among those students who had initiated sexual intercourse, 48.3% reported using a condom or some form of contraceptives the last time they had sexual intercourse at baseline. At follow-up, 15.5 % of students who delayed sexual intercourse at baseline initiated sexual intercourse, where only 56.3% reported using a condom during the last time they had sexual intercourse. In contrast, among students who had initiated sexual intercourse at baseline, 70% reported using a condom the last time they had sexual intercourse at follow-up.

At one-year follow-up, students who delayed sexual intercourse prior to baseline reported significantly higher positive attitudes about abstinence (89.7%) compared to students who had initiated sexual intercourse (62.8%). Students who had initiated sexual intercourse also reported higher intentions of sexual intercourse within the next year (47.8%) compared to students who delayed sexual intercourse at baseline (15.2%). See Table 1.

Table 2

Differences between Sexual Intercourse Initiation Groups on Follow-up Outcome Measures, Controlling for Baseline Characteristics and Covariates (n= 390)

	F	Initiated Sex Adjusted Mean	Delayed Sex Adjusted Mean
STI/HIV Knowledge (0-18)	0.24	13.84	14.03
Parent Communication (0-6)	0.02	2.99	2.95
Positive Attitude toward Abstinence*	13.24	0.70	0.88
Negative Attitude toward Teen Pregnancy	0.63	0.97	0.94
Sex Intent	1.15	0.25	0.17

Note: * = ≤ 0.05 . Covariates are gender and college expectancy.

Multivariate Analyses of Outcomes

ANCOVA findings are displayed in Table 2. Gender and college expectancy served as covariates in all models. Additionally, baseline scores for the outcomes were included as

covariates for follow-up test outcome scores. Controlling for baseline characteristics, there were no differences found between sexually active and non-sexually active students on HIV/STIs knowledge, parent communication, attitudes about teen pregnancy, and intentions to engage in sexual intercourse within the next year. However, students who had initiated sexual intercourse (70%) reported fewer long-term positive attitudes about abstinence compared to students who delayed sexual intercourse (88%).

Discussion

The replication of *RTR* in rural California found mixed evidence for the effectiveness of the program between sexually active and non-active students. At baseline, students who had initiated sexual intercourse were more likely to be male and have high intentions to engage in sexual intercourse within the next year. They also had fewer positive attitudes about abstinence and college expectations compared to students who delayed sexual intercourse at baseline. At follow-up, students who had initiated sexual intercourse continued to have fewer positive attitudes about abstinence and remained more likely to intend to have sexual intercourse within the next year compared to students who delayed sexual intercourse at baseline. Findings from this study are consistent with previous studies that have evaluated *RTR* (Hubbard et al., 1998; Kirby et al. 1991) as well as other prevention programs (East et al., 2003).

Students who initiated sexual intercourse reported a higher use of contraception at follow-up. Among the 15.5% of the sample who became sexually active by follow-up, only 59.2% reported using contraceptives, compared to 70% of students who had initiated sexual intercourse at baseline, indicating that *RTR* impacted decisions to practice safe sex among students who had already initiated sexual intercourse at baseline. Mixed findings for sexual activity status and contraception use were reported across prior studies examining *RTR*. For example, Kirby et al. (1991) found an increase in contraception use among lower-risk students and females who were sexually active

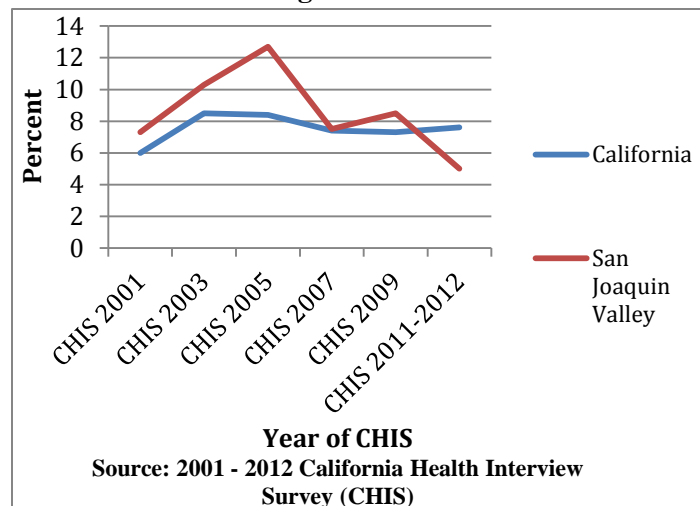
at baseline. Hubbard et al. (1998) found an increase in contraception use among students who became sexually active by follow-up.

Students in this study had lower percentages of reported sexual intercourse at baseline, less initiation of sexual intercourse during the study year, and greater use of safe sex practices compared to students in the Kirby et al. (1991) and Hubbard et al. (1998) studies. Differences seen in students who initiated sexual intercourse between this study and previous studies that have evaluated *RTR* can be due to the declining trend of sexual risk behaviors in California. Figure 1 compares the trends among adolescents who initiated sexual intercourse under the age of 15 between California and the San Joaquin Valley (i.e., Tulare, Fresno, Kings, Kern, Stanislaus, Merced, Madera, and San Luis Obispo Counties) from 2001-2012. In California there has been a 1.6% increase in the number of adolescents who had initiated sexual intercourse under the age of 15 from 2001 (6%) to 2011-2012 (7.6%). See Figure 1. In contrast, there has been a 2.3% decrease in the number of adolescents residing in the San Joaquin Valley who initiated sexual intercourse under the age of 15 from 2001 (7.3%) to 2011-2012 (5%). These results indicate that adolescents residing in the San Joaquin Valley are more likely to delay sexual intercourse beyond 15 years old compared to adolescents in California. It is also important to note that though the majority of students who initiated sexual intercourse at baseline in this study were male, they were considered at lower-risk for teen pregnancy due to their high school being located within an advantaged community in Tulare County, supporting findings in the Kirby et al. (1991) study.

Limitations

All data reported for were self-reports from students; therefore, it is unknown whether or not students answered all questions with integrity. Furthermore there was no control group. Thus we were not able to determine to what extent the *RTR* intervention impacted outcomes relative to no intervention received.

Figure 1



Trend Line Comparison between California and the San Joaquin Valley for Adolescents who First had Sexual Intercourse Under 15 Years Old

Implications of Study

Compared to students who delayed sexual intercourse, *RTR* had less long-term impact on students who had initiated sexual intercourse, specifically in regards to positive attitudes about abstinence, but more long-term impact over actual safe sex practices. Compared to Kirby et al. (1991) and Hubbard et al. (1998), students in this study were predominately Latino/Hispanic and resided in a rural community, providing new evidence on the effectiveness of *RTR* for these populations.

Future Studies

Further research should examine the impacts of factors such as nativity to the U.S. and primary language spoken at home on knowledge gain, parent communication, attitudes about abstinence and teen pregnancy, and safe sex practices. Findings suggest that Latino males are more likely to engage in sexual intercourse compared to females during adolescence, indicating a need for the examination of Latino males' perspective on condom use and pregnancy prevention (Mueller, 2009).

Students' relatively low condom use at one-year follow-up caused for more innovative methods to discuss safe sex practices. As a result, the

Tulare Community Health Clinic created a website, ateenthing.com, where students can find out more information about HIV/STIs and contraception methods. Additionally, there is an interactive chat tool where students can ask reproductive and sexual health professionals questions about their reproductive health needs. Students are provided with the link to this website upon completion of RTR in efforts to not interfere with program fidelity. With this change and the current Tulare Community Health mobile Clinic available at all high schools in the Tulare Joint Union School District 2-3 times a week year-round, we expect to see an increase in contraception use among students who had initiated sexual intercourse at baseline and those who initiated sexual intercourse between program implementation and follow-up. Further

findings from this study support that abstinence programs are ineffective in reducing teen pregnancy and the transmission of HIV and STIs among sexually active adolescents (Stanger-Hall & Hall, 2011). However, comprehensive sex education programs, such as RTR, are effective in increasing condom use among those who are already sexually active, and delaying sexual debut among adolescents who are not sexually active (Hubbard et al., 1998; Kirby et al., 1991; Zimmerman et al., 2008).

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References

- California Department of Public Health. (2013). California Teen Birth Rates 1991-2011. Available at: <http://www.cdph.ca.gov/programs/mcah/Documents/MO-MCAH-2011TBRDataSlides.pdf>. Accessed March 7, 2014.
- California Department of Public Health (2012). California Teen Birth Rate Drops to Record Low. Available at: <http://www.cdph.ca.gov/Pages/NR12-012.aspx>. Accessed December 1, 2013.
- Center for Disease Control and Prevention (2012). About Teen Pregnancy. Available at: <http://www.cdc.gov/TeenPregnancy/AboutTeenPreg.htm>. Accessed December 1, 2013.
- Coyle, K., Basen-Engquist, K., Kirby, D., Parcel, G., Banspach, S., Collins...& Harrist, R. (2001). Safer Choices: Reducing Teen Pregnancy, HIV, and STDs. *Public Health Reports*, 116(Suppl 1), 82.
- East, P., Chien, N.C., & Barber, J.S. (2012). Adolescents' Pregnancy Intentions, Wantedness, and Regret: Cross-Lagged Relations with Mental Health and Harsh Parenting. *Journal of Marriage and Family*, 74(1), 167-185.
- East, P., Kiernan, E., & Chávez, G. (2003). An Evaluation of California's Adolescent Sibling Pregnancy Prevention Program. *Perspectives on Sexual and Reproductive Health*, 35(2), 62-70.
- Eaton, D. K., Kann, L., Kinchen, S., Shanklin, S., Flint, K. H., Hawkins, J.,...& Centers for Disease Control and Prevention (CDC). (2012). Youth Risk Behavior Surveillance-United States, 2011. *MMWR Surveillance Summary*, 61(4), 1-162.
- ETR Associates. 2010. Reducing the Risk Student Knowledge Survey Key (revised 9.22.10). Scotts Valley, CA: ETR Associates. Available at: http://pub.etr.org/upfiles/EvidBase_StdntKnwldgSrvy9_10_Key.pdf. Accessed March 5, 2014.
- Flaspohler, P., Lesesne, C.A., Puddy, R.W., Smith, E., & Wandersman, A. (2012). Advances in Bridging Research and Practice: Introduction to the Second Special Issue on the Interactive System Framework for Dissemination and Implementation. *American Journal of Community Psychology*, 50(3-4), 271-281.
- Hoff, T., Greene, L., & Davis, J. (2003). National Survey of Adolescents and Young Adults: Sexual Health Knowledge Attitudes and Experiences. *Kaiser Family Foundation*. Available at: <http://kaiserfamilyfoundation.files.wordpress.com/2013/01/national-survey-of-adolescents-and-young-adults.pdf>. Accessed February 13, 2014.
- Hubbard, B. M., Giese, M. L., & Rainey, J. (1998). A Replication Study of Reducing the Risk, a Theory-Based Sexuality Curriculum for Adolescents. *Journal of School Health*, 68(6), 243-247.

- Kearney, M. S., & Levine, P. B. (2012). Explaining Recent Trends in the US Teen Birth Rate. *National Bureau of Economic Research*, Paper No. w17964.
- Kirby, D., Barth, R. P., Leland, N., & Fetro, J. V. (1991). Reducing the Risk: Impact of a New Curriculum on Sexual Risk-Taking. *Family Planning Perspectives*, 23(6), 253-63.
- Kirby, D., Coyle, K., & Gould, J. B. (2001). Manifestations of Poverty and Birthrates among Young Teenagers in California Zip Code Areas. *Family Planning Perspectives*, 33(2), 63-69.
- Kirby, D. B., Baumler, E., Coyle, K. K., Basen-Engquist, K., Parcel, G. S., Harrist, R., & Banspach, S. W. (2004). The "Safer Choices" Intervention: Its Impact on the Sexual Behaviors of Different Subgroups of High School Students. *Journal of Adolescent Health*, 35(6), 442-452.
- Lachance, C.R., Burrus, B.B, & Scott, A.R. (2012). Building an Evidence Base to Inform Interventions for Pregnant and Parenting Adolescents: a call for rigorous evaluation. *American Journal of Public Health*, 102(10), 1826-1832.
- Lavin, C. & Cox, J.E. Teen Pregnancy Prevention: Current Perspective (2012). *Current Opinion in Pediatrics*, 24(4), 462-469.
- Lucile Packard Foundation for Children's Health. (2013). Teen Births: Tulare County. Available at: <http://www.kidsdata.org/topic/314/teenbirths/trend#fmt=1127&loc=359&tf=13,64>. Accessed December 1, 2013.
- Markham, C. M., Peskin, M. F., Shegog, R., Baumler, E. R., Addy, R. C., Thiel, M., ... & Tortolero, S. R. (2014). Behavioral and Psychosocial Effects of Two Middle School Sexual Health Education Programs at Tenth-Grade Follow-Up. *Journal of Adolescent Health*, 54(2), 151-159.
- Markham, C. M., Tortolero, S. R., Peskin, M. F., Shegog, R., Thiel, M., Baumler, E. R., ... & Robin, L. (2012). Sexual Risk Avoidance and Sexual Risk Reduction Interventions for Middle School Youth: A Randomized Controlled Trial. *Journal of Adolescent Health*, 50(3), 279-288.
- McKenzie, J. F., Pinger, R. R., & Kotecki, J. E. (2011). An Introduction to Community Health. Sudbury, MA: *Jones & Bartlett Publishers*, LLC.
- Mueller, T. E., Castaneda, C. A., Sainer, S., Martinez, D., Herbst, J. H., Wilkes, A. L., & Villarruel, A. M. (2009). The Implementation of a Culturally Based HIV Sexual Risk Reduction Program for Latino Youth in a Denver Area High School. *AIDS Education & Prevention*, 21(Supplement B), 164-170
- Perlman, S. B., Klerman, L. V., & Kinard, E. M. (1981). The Use of Socioeconomic Data to Predict Teenage Birth Rates. An Exploratory Study in Massachusetts. *Public Health Reports*, 96(4), 335.
- Sieving, R. E., McMorris, B. J., Secor-Turner, M., Garwick, A. W., Shlafer, R., Beckman, K. J...& Seppelt, A. M. (2013). Prime time: 18-month Violence Outcomes of a Clinic-Linked Intervention. *Prevention Science*, nSuppl (20130402), 1-13.
- Stanger-Hall, K. F., & Hall, D. W. (2011). Abstinence-only Education and teen Pregnancy rates: Why we need Comprehensive sex Education in the US. *PloS one*, 6(10), e24658.
- The Office of Adolescent Health (2013). Performance Measures. Available at: <http://www.hhs.gov/ash/oah/oah-initiatives/webinars/tpp-performance-measures-and-questions-ab-grantees-only.pdf>. Accessed March 5, 2014.
- UCLA Center for Health Policy Research (2012). 2001 - 2012 California Health Interview Survey: Adolescent Sexual History: Entire State of California. Available at: <http://ask.chis.ucla.edu/main/DQ3/output.asp>. Accessed December 1, 2013.
- UCLA Center for Health Policy Research (2012). 2001 - 2012 California Health Interview Survey: Adolescent Sexual History: San Joaquin Valley. Available at: <http://ask.chis.ucla.edu/main/DQ3/output.asp>. Accessed December 1, 2013.
- U.S. Census Bureau Quick Facts (2013). California, United States. Available at: <http://quickfacts.census.gov/qfd/states/06000.html>. Accessed December 1, 2013.
- U.S. Census Bureau Quick Facts (2013). Tulare County, California. Available at: <http://quickfacts.census.gov/qfd/states/06/06107.html>. Accessed December 1, 2013.

WestEd for the California Department of Education (2014). California Healthy Kids Survey Sexual Behavioral Model Supplement 1. Available at: <https://chks.wested.org/resources/hs-sexbehav-1314.pdf>. Accessed March 5, 2014.

Zimmerman, R. S., Cupp, P. K., Donohew, L., Kristin Sionéan, C., Feist-Price, S., & Helme, D. (2008). Effects of a School-Based, Theory-Driven HIV and Pregnancy Prevention Curriculum. *Perspectives on Sexual and Reproductive Health*, 40(1), 42-51.

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