

ABSTINENCE-ONLY SEXUAL EDUCATION VS. COMPREHENSIVE SEXUAL
EDUCATION, WITH EMPHASIS ON THE ATTITUDES, KNOWLEDGE, AND
BEHAVIORS OF ADOLESCENTS

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We hereby recommend that the research project prepared under our supervision by Erika Phillips entitled Abstinence-Only Sexual Education vs. Comprehensive Sexual Education, with Emphasis on the Attitudes, Knowledge, and Behaviors of Adolescents be accepted as partial fulfillment for the degree of Master of Physician Assistant.

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ABSTRACT

In 2003, the Youth Risk Behavior Surveillance survey reported that 46.7% of high school students had been sexually active.¹ In 2000, 9.1 million of the 18.9 million new cases of STDs came from young people age 15-24.² Due to these statistics, there is an ongoing debate concerning teenage sexual education in the United States and how to make a greater impact on the attitudes, knowledge, and behavior of adolescents.

Purpose: To determine whether Abstinence-Only or Comprehensive sexual education has more of an impact on the attitudes, knowledge and sexual behaviors of adolescents.

Methods: An evidence based literature review was completed using published studies involving Abstinence-Only and Comprehensive sexual education. These studies were then evaluated to determine which method has the greatest impact on the knowledge, attitudes, and behaviors of adolescents.

Results: Of the eleven Comprehensive sexual education studies, eight were Evidence Level I and three were Evidence Level II-1. Ten Abstinence-Only programs were evaluated, four were Evidence Level I, three were Evidence Level II-1, two were Evidence Level II-2, and one was Evidence Level II-3. There was one Evidence Level I study that directly compared Abstinence-Only and Comprehensive sexual education. The bulk of the literature supports Comprehensive sexual education as having the greatest impact on adolescents' attitudes, knowledge, and behaviors.

Conclusion: Based on a thorough review of the literature, Comprehensive sexual education was given a B recommendation (at least fair evidence that the intervention improves important health outcomes) and Abstinence-Only sexual education was given a C recommendation (no recommendation for or against this intervention because the balance of benefits and harms is too close to justify a stronger recommendation.)

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CHAPTER I

INTRODUCTION

Adolescent sexual behavior has been a major issue for many years. According to the Youth Risk Behavior Surveillance Survey, in 2003, 46.7% (+/-2.6) high school students reported having had sexual intercourse at some point in their life.¹ Of these students 34.3% (+/-2.1) reported being sexually active within the last three months.¹ Of the currently sexually active students, only 63.0% (+/-2.5) used a condom during their last sexual experience, 17.0% (+/-2.3) used birth control pills at time of last intercourse, and 25.4% (+/-2.3) drank alcohol or used drugs before their last sexual intercourse.¹ In 2000, it was reported that there were 18.9 million new cases of sexually transmitted diseases (STDs) that occurred in the United States and that 9.1 million of these cases were among young people, ages to 15-24.² The three most commonly acquired STDs among this age group were Human Papilloma Virus (HPV), followed by Trichomoniasis and Chlamydia.² The STDs among this age group had an estimated direct medical cost of \$6.5 billion, with viral STDs accounting for 94% of the total burden and non-viral STDs for the remaining 6%.³

Recent research by Dunne et al.⁴ concerning the prevalence of HPV found that 33.8% of 14-24 year old sexually active females have HPV, which corresponds to approximately 7.5 million females in the United States. The number of females infected with HPV significantly increases each year among ages 14-24. After age 24, the amount of females with HPV begins to decline yearly. Of females aged 14-19 years, 6.2% have one of the following HPV types: 6, 11, 16, 18. Of the females tested in this study, 5.2% had one type of HPV despite denying history of sexual intercourse and of the 5.2%, 88% of these females were between ages 14-19.

Another issue that is often addressed with adolescent sexuality is pregnancy. In 2004, there were 6,789 births to 10-14 year olds and 415,408 for 15-19 year olds.⁵ The rate for 15-19 year olds was 41.2 births per 1000 females.⁵ These rates had declined modestly from 2003 for teenagers 15–19, but increased slightly for ages 10–14.⁵ Not only did birth rates decline but abortion rates for 15-17 year olds also decreased. In 1983, there were 30.7 abortions per 1000 females while in 2000, the induced abortion rate had declined over 50% to 14.5 abortions per 1000 females.⁶

The two main reasons for declining pregnancy rates according to Santelli et al. are increased contraceptive use and sexual abstinence.⁷ From 1995-2002 the number of 15-19 year olds that had ever had sexual intercourse declined 10%. For 15-17 year olds the number of females that had ever had intercourse declined 22%, but there was no significant decline in the rate of intercourse for this age group. While the sexual intercourse rate slightly declined, the rate of contraceptive use did increase significantly. Overall for 15-19 year olds, condom usage increased from 36% to 53%, birth control pill use increased from 24% to 33%, and the use of two methods of birth control increased from 11% to 26%. For 15-17 year olds, these rates increased more significantly. Condom usage increased from 38% to 58%, birth control use increased from 19% to 39%, and use of two methods increased from 12% to 33%. Females in this age group who did not use contraception decreased from 35% to 14%. The overall pregnancy risk decreased 38% for 15-19 year old females while there was a 55% decrease in pregnancy risk for females age 15-17. In females aged 15-19, researchers estimated that 14% of the decreased pregnancy risk was due to the decline in sexual activity of these females, while 86% was due to the increase in contraception use or decrease in nonuse of contraception. Specifically for 15-17 year old females, 23% of the decline in pregnancy was estimated to be due

to decreased sexual activity and 77% was because of increased contraception. In the 18-19 year old females, Santelli et al. estimated that 100% of the decline in pregnancy rates was due to the improved contraceptive use and the decline in nonuse. This data was most significant among non-Hispanic Whites.⁷

Because of these statistics there is currently a debate concerning teenage sexual education in the United States and how to make an impact on adolescents' sexual behavior. Comprehensive sexual education and Abstinence-Only sexual education are in the middle of this debate since they are the most common types of sexual education in this age group. Comprehensive sexual education programs, also known as Abstinence-Based or HIV prevention programs, are those that typically emphasize abstinence as the safest method for preventing STDs and pregnancy. These programs also teach that condoms and other methods of contraception provide protection against STDs and pregnancy and thus are safer than unprotected sex.⁸

In contrast, Abstinence-Only sexual education completely avoids discussing the benefits and harms associated with condom and contraception use. Any program that is “providing instruction in or promoting the use of birth control would be inconsistent with the A-H definitions” and therefore would not be considered Abstinence-Only sexual education.⁹ Abstinence-Only sexual education is defined by the following criteria, federally funded through the Title V, Section 510 Programs.

An Abstinence-Only program is required to:

- A Have as its exclusive purpose teaching the social, psychological, and health gains to be realized by abstaining from sexual activity

- B Teach abstinence from sexual activity outside marriage as the expected standard for all school-age children
- C Teach that abstinence from sexual activity is the only certain way to avoid out-of-wedlock pregnancy, sexually transmitted diseases, and other associated health problems
- D Teach that a mutually faithful, monogamous relationship in the context of marriage is the expected standard of sexual activity
- E Teach that sexual activity outside the context of marriage is likely to have harmful psychological and physical effects
- F Teach that bearing children out-of-wedlock is likely to have harmful consequences for the child, the child's parents, and society
- G Teach young people how to reject sexual advances and how alcohol and drug use increases vulnerability to sexual advances
- H Teach the importance of attaining self-sufficiency before engaging in sexual activity¹⁰

To meet federal guidelines each Abstinence-Only sexual education program must incorporate all of these points into their teachings but the programs are able to choose how much emphasis they place on each criterion.¹¹

In 1996, Abstinence-Only sexual education was appropriated funding of \$50 million annually for five years.¹² In 2003 the funding was increased to \$73 million for those programs that met the A-H criteria.¹² Participating states then matched every \$4 of federal funding with \$3 of their own funding.⁹ There are currently over 700 Abstinence-Only sexual education programs across the United States receiving funding.

However, to date there have been few studies comparing the effectiveness of these Abstinence-Only sexual education programs with Comprehensive sexual education programs. Comprehensive sexual education programs, while taught in many public schools, are not directly supported by the federal government. Supporters of Abstinence-Only sexual education contend that emphasizing abstinence while giving information about contraception is ineffective and will increase the number of students having intercourse.⁹

Purpose of Study

With the growing debate over which sexual education program is more effective, this study aims to determine which program is more effective in impacting the attitudes, knowledge and behaviors regarding sexual activity of adolescents.

CHAPTER II

METHODOLOGY

The data for this study was collected from a comprehensive review of evidence based medical literature. The studies used pertained to adolescents participating in Abstinence-Only sexual education programs or Comprehensive sexual education programs. Medline First Search database and PubMed were searched using MESH terms: adolescent, sexual education, sexual behavior, sexual abstinence, Abstinence-Only sexual education, Comprehensive sexual education, and sexually transmitted diseases- prevention and control. Government reports published on Abstinence-Only sexual education were also used for this study. Although these reports were not always peer reviewed, they were carefully scrutinized by government scientists. Medical List Serves from June 2005 to April 2007 were monitored for the release of new studies or reports related to sexual education, teen pregnancy, contraception, and sexually transmitted diseases.

Articles published from 1997 to the present were categorized based on the type of study, the type of journal, and the relevance of the data. Randomized control trials, literature reviews, government reports, and case-control studies were used for the review due to the limited number of randomized control trials that were available. To be included in the study the article had to be a study of an Abstinence-Only sexual education program or a Comprehensive sexual education program. The program studied also had to measure the change of the participants' attitudes, knowledge, and/or behaviors due to the program's implementation. All individual studies were ranked according to the United States Preventative Services Task Force (USPSTF) criteria as follows:

Levels of Evidence¹³

I: Evidence obtained from at least one properly randomized controlled trial.

II-1: Evidence obtained from well-designed controlled trials without randomization.

II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.

II-3: Evidence obtained from multiple time series with or without the intervention.

Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.

Exclusion criteria include studies done outside the United States, studies that primarily evaluated the impact of Service Learning Projects on youth, and studies that had been published before 1997. The data from the included articles were then reviewed and compared to determine whether Abstinence-Only sexual education or Comprehensive sexual education had a larger impact on attitudes, knowledge, and behaviors of adolescents.

CHAPTER III

REVIEW OF LITERATURE

Comprehensive Sexual Education Studies

Of the Comprehensive sexual education studies there were eleven studies that were evaluated. Eight were Evidence Level I and three were Evidence Level II-1. (Appendix A)

Of the Evidence Level I studies, four evaluated the *Safer Choices* intervention.¹⁴⁻¹⁷ The *Safer Choices* intervention, which lasted for two years, began with 3,869 ninth grade students in ten California and ten Texas high schools that were randomly assigned to either the treatment or control group. After the initial program effects were analyzed, the program was further analyzed 31 months later for effects on various subgroups within the intervention.¹⁵ The Safer Choices Project was a two year evaluation that had follow ups at seven, nineteen, and/or thirty-one months. Thirty-one months was the longest follow up of any Comprehensive sexual education program included in this evaluation. This allowed researchers to determine the long-term impacts of the *Safer Choices* program. The intervention only showed a significant delay in initiation of intercourse on its Hispanic participants. It also did not show a significant decrease in the number of students that reported intercourse in the previous three months. It did, however, increase the use of condoms and decreased the instances of unprotected sex on the intervention group at seven and nineteen months. At 19 months, this was most significant with ninth grade students, but not found to be statistically significant for tenth to twelfth grade students. At 31 months, the program was still effective for decreased instances of unprotected sexual intercourse in the preceding three months. This was statistically significant for ninth and eleventh grade students but not for tenth or twelfth grade students. The proportion of students who had intercourse during the three months prior to the survey was still not significantly reduced.

When looking at subgroups there were no significant gender interactions in the initiation of sexual intercourse.

Kirby et al.¹⁵ found that on all four measures regarding condom usage (number of times of unprotected sexual intercourse, number of unprotected partners, condom usage at last intercourse, and contraceptive use at last intercourse) the males students improved significantly. The females also showed a significant decrease in the number of times of unprotected sex. This demonstrated that the male students were more greatly impacted than female students regarding condom usage in this intervention. African Americans, Caucasians, and Asians, each were only significantly impacted in one of the four condom usage measures.

Safer Choices showed a significant decrease in the amount of unprotected sex for students who initiated sex after baseline compared to students who were sexually experienced prior to the program. Sexually experienced youth, on the other hand, had significantly greater condom usage at last intercourse as compared to those who were sexually inexperienced at baseline. In regards to attitudes, the intervention students expressed more positive attitudes toward condom usage than the control at seven and nineteen months. They did not show a difference in attitudes or normative beliefs regarding sexual intercourse as compared to the control at seven, nineteen, or thirty-one months. At 31 months, the *Safer Choices* participants perceived a higher risk of HIV and other STDs.

Knowledge also increased significantly for the *Safer Choices* intervention as compared to the control group in HIV and other STD knowledge at seven, nineteen, and thirty-one months. At 19 months, while the HIV knowledge had significantly increased in all grades compared to the control group, the STD knowledge was found to be statistically significant only at the ninth

grade level. At the 31 month follow up, there was a location interaction found with the Texas schools scoring higher in STD knowledge than the California schools.

*Skills and Knowledge for AIDS and Pregnancy Prevention (SNAPP)*¹⁸ project was an Evidence Level I study that was evaluated by Kirby et al. It was developed by the Division of Adolescent Medicine, Children's Hospital Los Angeles. This program used interactive learning activities, skill building, and was taught by peer-educators in eight sessions over a two week period. The peer educators were young HIV-positive males, teen mothers, or other youth. The use of HIV-positive males and teen mothers as peer educators was to make students more aware of possible consequences of unprotected sexual intercourse.

This study, by Kirby et al., evaluated 1,657 seventh grade students in Los Angeles and had five and seventeen month follow ups. This intervention was found to significantly increase knowledge at the five and seventeen month follow ups as compared to the control group. At five months this was approximately a 10% knowledge increase. Also at five months, students in the *SNAPP* intervention were significantly more willing to be friends with an HIV-positive person, but at seventeen months this finding was no longer statistically significant. At 17 months, the researchers found that students in the intervention were slightly more likely to believe that their friends thought a condom should always be used during sex, while those in the control group were slightly less likely to believe this, making this change in attitude statistically significant. In regards to the initiation of intercourse, there were no significant differences at both five and seventeen months between the intervention group and the control group. This was not significant for either gender or any specific ethnic group within the intervention or control. The *SNAPP* intervention also did not have a significant impact at five and seventeen months on the number of times students had intercourse in the previous three or twelve months, the number of

sexual partners during the previous twelve months, the use of condoms or birth control, or in pregnancy or STD rates. At 17 months, the difference in the use of birth control was approaching significance with 24% of the intervention and 35% of the control using birth control pill, which was opposite of the researchers' original hypothesis.

*Client Centered Programs to Prevent Pregnancy*¹⁹ studied 1,042 youth ages nine to thirteen (sites A-D) and 690 teens ages fourteen to seventeen (Sites E-G) that were randomized into treatment or control groups. This Evidence Level I program combined education and skill building with individualized client services. These individualized services include advocacy, counseling, or mentorship; links to clinical family planning services; and opportunities for the clients to participate in social or recreational activities. This evaluation did not measure the effect on knowledge, but did find significant effect on attitudes at Site C and E with clients having lower intentions to have intercourse as compared to the controls. Sites F and G did not have any significant attitude changes. However Site F did show significant effects on participants' behaviors. These clients showed significantly lower frequencies of sexual behavior in the last month. This site also had significantly higher and more consistent use of contraceptives at last intercourse.

The *Healthy for Life (HFL)*²⁰ project evaluated 1,981 students from twenty-one schools starting at grade six and continuing until grade ten in small towns and cities in Wisconsin. This project did not study knowledge or attitudes but instead focused solely on the behavioral impacts of this project on adolescents. Since this study was a randomized control trial it was ranked Evidence Level I. Overall, the *HFL* intervention was found to be ineffective in reducing the rate of intercourse and in increasing condom use among its participants. Tenth grade students from the Age Appropriate intervention were found to have a significantly higher rate of lifetime

intercourse than the control students. Among ninth and tenth grade females in the Age Appropriate *HFL* intervention, more students reported significantly higher lifetime intercourse and past month intercourse than the control. The number of students who had higher past month intercourse was significantly larger for eighth grade students in the Intensive condition. Moberg et al. found that both the Age Appropriate and Intensive *HFL* conditions increased the likelihood of intercourse by 9th grade, although this change was noted in the “ever” category and not the past month intercourse category. Increased consistent condom usage was significant for ninth grade sexually active students. This was shown to be a function of involvement with the opposite sex at baseline.

Two Comprehensive sexual education programs evaluated the *Postponing Sexual Involvement (PSI)* intervention combined with another intervention program. Aarons et al.⁹ was an Evidence Level I study that evaluated seventh grade students through the end of eighth grade in Washington D.C. who had been given the *PSI* and *Self Center* curriculum. This intervention was found to significantly increase the knowledge of reproductive health service scales at the end of eighth grade for females and showed significantly higher scores for males at all three follow ups in regards to birth control knowledge scales. All four surveys regarding attitudes found a higher percentage of females that said that they would definitely not have sex in the next six months and that felt they could refuse sex with their boyfriend if they did not feel ready. This was found to be significant for both measures at the end of seventh grade only. Also at the end of seventh grade, significantly more females believed that most girls their age were not having sex. For males, the only significant finding related to attitudes was for males at the end of seventh grade and beginning of eighth grade having more positive attitudes with regards of delayed childbearing. Females in the intervention group had higher virginity rates at all follow

ups but this was only statistically significant at the end of eighth grade. Among non-virgin females, a higher use of birth control use at last intercourse was found at all follow ups. No significant behavioral effects were found for males at any point of this intervention.

PSI was also evaluated as part of the *Education Now and Babies Later (ENABL)* curriculum. The *ENABL* curriculum consisted of three aspects with the *PSI* curriculum at its core. *ENABL* also included a statewide media and public relations campaign, provision of training for individuals who teach *PSI*, and an evaluation of the effectiveness of the intervention. Arnold et al.²¹ studied the effects of the *ENABL* intervention on knowledge and beliefs by conducting a 14 question survey to determine the program's impact on participating adolescents. A significant difference was found in post-test scores of the intervention as compared to the control. The *ENABL* group had an increase from a mean pre-test score of 10.06 to a mean post-test score of 11.36. The comparison group's mean pre-test score increased from 10.02 to 10.31. It was noted that two of the comparison counties showed a decrease in their mean scores from pre-test to post-test survey. Since this was not a randomized trial, but was a well developed study, it was rated Evidence Level II-1.

The *Rochester AIDS Prevention Program (RAPP)* curriculum was implemented among 1,352 middle school students in Rochester, NY. This Evidence Level II-1 study, evaluated by Aten et al.,²² had a six to twelve month follow up to look for long-term effects. There was one control group and there were three intervention groups that were studied. Each intervention group was taught either by an adult educator, a regular teacher, or a peer educator. This evaluation not only looked at the effect of the curriculum on behavior, but also the effect due to the manner in which the curriculum was taught. This evaluation did not study the effect on knowledge or attitudes. There were no behavioral effects seen for females in any intervention

group while males in all intervention groups reported less initiation of sexual activity as compared to the control group. For abstinent students younger than 13, significant behavioral effects were seen for males only.

The last Comprehensive program that was evaluated was project *IMPACT*.²³ This Evidence Level II-1 study measured the effects on attitudes and behaviors in middle school students in three New York City middle schools. This project found no short or long-term differences in the attitudes of participants regarding intercourse or their intentions to have intercourse. There were also no significant long-term differences regarding teenage pregnancy rates, however, there were significant long-term differences in the attitudes of males regarding teenagers having sex. When evaluating behaviors, no statistically significant difference was found between groups in the overall sample regarding the initiation of sexual activity. Post-intervention males did show an increased rate of sexual activity, but this finding was no longer significant at the long-term follow up. For females, the initiation of intercourse was not statistically significant. There were also no significant differences found in rates of condom usage or reported pregnancies.

Abstinence-Only Sexual Education Studies

There were ten Abstinence-Only programs that were evaluated. Four were Evidence Level I, three were Evidence Level II-1, two were Evidence Level II-2, and one was Evidence Level II-3. (Appendix B)

The *PSI* curriculum evaluated by Kirby et al²⁴ was an Evidence Level I Abstinence-Only intervention. This program evaluated 10,600 youths in California with a mean age of 12.8 years. This evaluation of the program took place with follow ups at three and seventeen months. It did not measure knowledge, but instead focused on the impact of the program on the attitudes and

behaviors of the youth involved. At three months, the evaluation found that the intervention group was more likely to believe that their peers endorsed postponing sexual intercourse. They also believed that becoming sexually active during the teenage years was not inevitable, but this was not a statistically significant finding at 17 months. There were no significant statistical differences in the number of reasons or conditions under which youths believed they would engage in sexual intercourse. No significant differences were found in the beliefs of the participating adolescents regarding sexual pressure or in the estimates of their peers who were sexually active at three or seventeen months.

Kirby et al. found at three months, youth led interventions were significantly more likely than the control group to report an intention to refuse sex even when stirred by sexual feelings. Those in the adult led intervention were significantly more likely to indicate they intended to refuse pressure to have sex than the control and the youth led groups were. No significant differences were found regarding attempts to persuade others to engage in intercourse at both the three and seventeen month follow ups for both groups.

Sexually inexperienced youth did not show any behavioral impacts in regards to initiation of intercourse or the postponement of sexual intercourse among specific subgroups. The intervention also did not significantly impact the frequency of intercourse or the number of partners for sexually experienced youth at both follow ups. The usage of oral contraceptives and condoms were not significantly different among the intervention and control groups.

At 17 months students in the youth led intervention had a significantly higher pregnancy reporting rate than the control group. This statistic was found in only one school and involved males in one seventh grade classroom, but the increased number of males that reported the pregnancy made this a statistically significant finding. Once controlled for this finding was no

longer significant. Also at 17 months, there was a significant difference in the adult led intervention as compared with the control group with participants in this intervention reporting significantly higher rates of STDs. This finding did not carry over into youth led intervention.

Maynard et al.²⁵ and Trenholm et al.²⁶ were both Evidence Level I government studies that evaluated four Abstinence-Only programs. The first program evaluated was *My Choice, My Future* which was a three year program taught to 448 students in the 8th grade in Powhatan, VA. It was in a school setting and was a non-elective class with mandatory attendance. This program lasted three years, with thirty sessions in the first year, eight in the second year and fourteen in the final year. They would occasionally have school assemblies and community outreach. This program served middle- and working-class, two parent white, non-Hispanic, families living in a semi-rural setting.

Recapturing the Vision, in Miami, FL, was an Abstinence-Only program taught to 480 students in the sixth through eighth grade. This elective program with mandatory attendance was in a school setting in an urban community. This program served poor, single-parent, African American and Hispanic students. This program involved a year long class that met daily.

Another program that was evaluated in this study was *Teens in Control* that was taught to 715 students in the fifth grade in Clarksdale, MS. This two year program had weekly pull-out class sessions and the students involved were poor, African Americans from single-parent families in a rural setting. *Teens in Control* was a non-elective class with mandatory attendance during school hours.

Families United to Prevent Teen Pregnancy (FUPTP) was the only after school program evaluated in this study. This was an elective class lasting for two and a half hours daily that allowed voluntary attendance and could be continued up to four years. It studied 414 students in

the third through eighth grade who were from poor, single-parent, African American families in an urban setting in Milwaukee, MI.

These four Abstinence-Only sexual education programs were initially evaluated for their effects on knowledge and attitudes, not sexual behavior. At the final follow up each of the four programs were evaluated for effects on all three of those areas. In the initial evaluation by Maynard et al., *My Choice, My Future* showed a significant increase in knowledge of pregnancy and STD risks, peer relations, and risk avoidance skills. *Teens in Control* showed a significant increase in knowledge of pregnancy and STD risks and risk avoidance skills. *ReCapturing the Vision* only showed a significant difference in knowledge in regards to risk-avoidance skills, while *FUPTP* did not show any significant increases in knowledge. *Teens in Control* was the only program that showed significantly higher views supportive of abstinence. *My Choice, My Future* and *ReCapturing the Vision* both had participants that demonstrated significantly higher views that were unsupportive of teen intercourse. Both of these programs also had views that significantly differed from the control in regards to perceived general and personal consequences of teen and non-marital sex.

There were no significant differences seen in any specific program with regard to the participants' expectations to abstain from intercourse as an unmarried teen. However, behavioral impacts showed a significant number of participants from *My Choice, My Future, ReCapturing the Vision*, and *FUPTP* pledging to abstain from sex until marriage. *ReCapturing the Vision* had a significant number of abstinence pledgers which was consistent with the program's formal use of abstinence pledging in its curriculum.

Four to six years later, Trenholm et al. completed the final follow-up looking for long-term effects on the participants. Trenholm et al. found that overall youth in the program group

were no more likely than the control group to have abstained from sex. The study also found that program students had a similar number of sexual partners and had initiated sex at the same mean age as the control group. Youth in the program group were also not more likely than those in the control group to have engaged in less unprotected sex.

Overall, program group students were significantly more likely to identify a greater number of STDs correctly as compared to the control group. Both groups had a high knowledge of unprotected sex risks, but were less knowledgeable about potential health risks from STDs. Students in the program group were less likely than the control group to report that condoms are usually effective at preventing STDs, yet were more likely than the control group to report that condoms are never effective at preventing STDs. The program group students were also significantly more likely to report that birth control pills do not prevent STDs, unlike the students in the control group.

There were few significant statistical findings when each site was looked at separately. While there were positive site effects seen from *ReCapturing the Vision*, with 48% of program youth being abstinent in the past 12 months, no statistically significant differences were found when compared to the control group. Students in the *My Choice, My Future* program showed a significant increase in knowledge of STD and pregnancy rates and they also showed a significant change in their perceptions of the effectiveness of condoms and birth control pills. While the program students were less likely than the control to perceive condoms as effective at preventing STDs, they were significantly more likely to perceive birth control pills as not being effective at preventing STDs. *My Choice, My Future* participants were also significantly more likely to identify STDs correctly and to have a greater knowledge of both unprotected sex risks and the potential health consequences of STDs than the control group.

Blake et al.²⁷, an Evidence Level I study, evaluated *Managing the Pressures before Marriage (MPM)* in middle school students. The *MPM* curriculum is a modified version of the *PSI* curriculum. This was a randomized control trial evaluating the *MPM-only* vs. the *MPM-enhanced* curriculum. The difference between the two programs was that the enhanced curriculum added five homework assignments to be completed by the students and their parents. As compared to baseline, the adolescents at post-test were significantly more likely to know of the effectiveness of abstinence as a prevention strategy, but their knowledge about the risk of pregnancy at first sex did not change. At post-test there was a significant increase in self-efficacy of sexual refusal or avoidance from baseline. The participants in the *MPM* programs also showed a significant decrease in behavioral intentions to have intercourse before finishing high school. When compared directly to the *MPM-only*, there were no differences with respect to knowledge or attitudes; however, those in the *MPM-only* group were significantly more likely to believe that those who have sex in one relationship will be expected to have sex in their next relationship as compared to the *MPM-enhanced*. *MPM-enhanced* also had a significantly greater self-efficacy with regard to sexual refusal or avoidance and were less likely to intend to have sex before completing high school.

Borawski et al.²⁸, an Evidence Level II-1, nonrandomized control trial, evaluated the *For Keeps* program, a state-funded Abstinence-Only program. This program was implemented in 2,069 students in the seventh and eighth grades in the Midwest. A significant increase in HIV/STD knowledge among the participants was found, however this finding did not differ by gender or sexual experience at baseline. The *For Keeps* program also showed a significant increase in participants' acceptance of abstinence until they became older and until marriage. Female students and sexually inexperienced students were found to be significantly more likely

to believe in remaining abstinent until they became older. Overall, students in this intervention reported a decline in their intentions to have sex in the next three months as well as in the next year. This study also found that *For Keeps* participants' intentions to use condoms at next intercourse had declined, but the impact on condom usage was significant only among sexually inexperienced students. No statistically significant differences were found between control and intervention groups in the reporting of sexual intercourse during the five month follow up period for both the sexually experienced and inexperienced students. For the students who did have intercourse during the five month follow up period, the intervention students reported fewer episodes of intercourse and fewer sexual partners. Although the results are most pronounced among the sexually experienced students, they were not statistically significant. No differences were found regarding condom use between the control and the intervention groups.

The *Life's Walk* program²⁹ was implemented in Northwest Missouri among eighth and tenth graders. This Evidence Level II-1 study evaluated by Barnett et al. was examined program in two evaluations. The first evaluation had a pre-test-post-test design. With respect to attitudes, no overall change was found; however, there was a marginally significant increase in a less-abstinence oriented attitude amongst eighth grade girls. Tenth grade males, on the other hand, became more-abstinence oriented and this finding was marginally significant. When asked to choose the best method for avoiding STDs and pregnancy, a significant change was seen regarding both questions, with abstinence becoming the preferred response of participants. Knowledge increased from pre-test to post-test for both the eighth and tenth graders, with the tenth graders scoring higher than the eighth graders. A significant increase for both genders was also seen in sexual behavior from pre-test to post-test evaluations with males showing a larger increase.

In evaluation two, a nonrandomized control trial was implemented in 86 eighth grade students. In this evaluation, no statistically significant differences were found with respect to attitudes between the intervention and control group. Significant differences were found when the treatment group was asked to identify the best method for avoiding an STD and pregnancy, with abstinence again becoming the preferred response. There were no statistical behavioral differences between the two groups, but statistically significant increases in knowledge for the intervention group were seen.

Sather et al.³⁰ was an Evidence Level II-1 nonrandomized control trial. This federally funded Abstinence-Only sexual education program was implemented in seventh and eighth graders. This program combined the *Family Accountability Communicating Teen Sexuality (FACTS)*, *Why Am I Tempted (WAIT)*, and *Unmasking Sexual Con-games*. This evaluation looked exclusively at attitudes. Sather et al. found no significant change in participating adolescents' attitudes about premarital sexual activity or their intentions to engage in premarital sexual activity. The treatment group showed there was no change from pre-test to post-test regarding views on premarital sex and whether their peers should have intercourse. The majority of the treatment group and the control group felt that intercourse at their age and as an unmarried teen was not acceptable for themselves or their peers.

The *Sex Can Wait*³¹ program was an Evidence Level II-2, federally funded Abstinence-Only sexual education program that met A-H criteria. This was a non-randomized control trial that evaluated upper elementary (fifth and sixth graders), middle school (seventh and eighth graders) and high school (ninth through twelfth graders) students in two follow ups. Initially there were significantly higher knowledge scores at the upper elementary level but not at the middle school or high school level. There were significant attitude differences relative to

hopelessness and self-efficacy at the upper elementary level. There were no differences in any area at the middle school level initially while the high school level showed significant differences in attitudes and intent to remain abstinent. Behavioral differences, related to decision making, were not seen at any level.

At 18 month follow up, Denny et al.³² found significantly increased knowledge in the upper elementary students. They also found these students were significantly less likely to report participation in sexual intercourse in the last month. The middle school students were significantly less likely to report participation in sexual intercourse ever and in the last month at the 18 month follow up. Students at the high school level scored significantly higher on knowledge and had a greater intent to remain abstinent at the 18 month follow up as well.

Doniger et al. was an Evidence Level II-3 study that evaluated the *Not Me, Not Now* program³³, with a cross-sectional design in Monroe County, NY. This program was a combination of a media campaign and the *PSI* sexual education curriculum. Only the effects on behaviors and attitudes were analyzed in this study. From Wave 1 to Wave 2 a significant increase was seen in the frequency of respondents that said they should “wait until they can support a baby” before they have sexual intercourse. The percentage of participants who said they could handle the consequences of having sexual intercourse decreased from 34% to 27% from Wave 1 to Wave 2 and then 27% to 22% from Wave 2 to Wave 3. This decrease from Wave 2 to Wave 3 was statistically significant. The percentage of students that responded they could be pressured into sex significantly decreased from 21% at Wave 1 to 18% at Wave 2 and the response to break up with the person pressuring them significantly increased from 27% at Wave 1 to 31% at Wave 2. The frequency of sexual intercourse by age 15 significantly declined from 46.6% in 1992 to 37.8% in 1995 to 31.6% in 1997. For 17 year olds, the frequency of self-

reported intercourse decreased from 53.9% to 50.4% to 51.4% in 1992, 1995, 1997, respectively; however, this decline was not found to be significant.

This study also evaluated the effect of the program on the pregnancy rates in the area. Initially pregnancy rates in Monroe County were higher than the two surrounding Upstate New York counties. By 1996, Monroe County's pregnancy rates had declined and were lower than the comparison areas. While this decline was a statistically significant downward trend for four of the five surrounding geographic areas, the slope of the trend line was steepest for Monroe County and was significantly steeper than the regression line for the three comparison areas.³³

Comparison Study

Only one study directly compared an Abstinence-Only sexual education program, a Comprehensive sexual education program, and a control group met inclusion criteria for this review (Appendix C). This study, by Jemmott et al.³⁴, was rated as Evidence Level I because it was a well developed randomized control trial. This study evaluated the effects of abstinence and safer-sex HIV risk reduction interventions on young inner-city African American adolescents. This was a randomized controlled trial that had three, six and twelve month follow ups. The study showed that the Abstinence-Only intervention participants were significantly less likely to report having sex in the three months after the intervention as compared to the control group and slightly less than the Comprehensive sexual education group (safer sex group), although not at six and twelve months. At the six and twelve month follow up sexually experienced adolescents in the safer sex group had less self-reported sexual intercourse and less unprotected sexual intercourse than the other groups. In regards to knowledge, the adolescents in the safer sex group and abstinence group showed higher scores in knowledge than the control,

with the safer sex group scoring higher in condom usage and HIV risk reduction knowledge than the abstinence group.

Excluded Studies

There were 14 evaluations that were excluded from this study based on the inclusion/exclusion criteria. Two of these studies dealt with service learning projects in conjunction with or instead of abstinence-only or comprehensive sexual education programs^{35, 36} and five of the excluded studies were published prior to 1997 and therefore did not meet inclusion criteria.³⁷⁻⁴¹ There were three studies done outside of the US, one completed in Chile⁴² that was an abstinence centered trial, one performed on Canadian teens⁴³ using a comprehensive sexual education program and one that evaluated *SHARE*⁴⁴ in thirteen Scottish schools. A paper on the *PARE (parent-adolescent relationship education)*⁴⁵ program was excluded due to it being a theoretical curriculum that had yet to be evaluated or implemented and a study regarding the *Baby Think It Over* program was excluded because it used simulated dolls as a pregnancy prevention program instead of a Comprehensive or Abstinence-Only sexual education program.⁴⁶ Lastly, two of these studies, while evaluating the Abstinence-Only or Abstinence-Based programs were excluded because they did not evaluate the knowledge, attitudes, or behaviors of the participants.^{47, 48}

CHAPTER IV

DISCUSSION

Evidence in the Literature

Comprehensive Sexual Education

Seven studies showed increases in the knowledge of participants. Jemmott et al.³⁴ showed increased knowledge immediately after the intervention regarding condom use, HIV prevention and risk reduction with the safer sex group scoring significantly higher than both the abstinence group and the control group. The *Safer Choices* intervention found increased knowledge regarding HIV and other STDs at the seven, nineteen, and thirty-one month follow ups.¹⁴⁻¹⁷ Increased knowledge of other STDs was significant for ninth grade students¹⁶ at nineteen month follow up and increased HIV knowledge was significant for ninth through twelfth graders at the both the nineteen and thirty-one month follow ups.¹⁶ Aarons et al.⁹ found that females at end of eighth grade had an increase in knowledge regarding reproductive health services and that male participants had increased knowledge of birth control at all three follow ups.

Among the Comprehensive programs evaluated many changes in attitudes were also noted. *Safer Choices*^{14, 16, 17}, Jemmott et al.³⁴ and *Project SNAPP*¹⁸ found significantly more favorable attitudes regarding condom use and condom self-efficacy. Increased self-efficacy for refusing intercourse was found in the *Safer Choices*¹⁶ intervention and also in female participants at the end of seventh grade in the study by Aarons et al.⁹

Decreased intent to have intercourse was reported by McBride et al.¹⁹ for intervention Sites C and E. In Aarons et al.⁹ more female participants reported a greater intent to remain

abstinent at the end of seventh grade and there were more positive attitudes toward delayed childbearing by male participants at the end of seventh grade and the beginning of eighth grade.

Two studies demonstrated a decrease in the initiation of intercourse. The *Safer Choices*¹⁵ intervention showed Hispanic students delaying initiation of intercourse. Aarons et al.⁹ found significantly increased virginity rates among female participants at the end of eighth grade follow up. Decreases in intercourse were seen in Jemmott et al.³⁴ at three and six month follow ups among the safer sex group and these decreases were especially significant among sexually experienced students. McBride et al.¹⁹ found decreases in intercourse at intervention Site F. The *Safer Choices* intervention showed decreases in unprotected intercourse at seven, nineteen and thirty-one months.^{14, 16, 17} which was significant for both males and females.¹⁵

Increase in condom usage was seen by Jemmott et al.³⁴ at the three, six and twelve month follow ups and in the *Safer Choices* intervention at seven months.¹⁴ When examined for group interactions, this increase in condom usage was greater for males in the *Safer Choices* intervention.¹⁵ Increased contraceptive use was seen by McBride et al.¹⁹ at Site F and by Aarons et al.,⁹ specifically among female participants.

While many findings were in the desired directions there were a few studies that had some unexpected findings. *Project SNAPP* found a decrease in number of participants who used birth control pills at last intercourse.¹⁸ Moberg et al.²⁰ reported that the students in Age-Appropriate *HFL* intervention in the tenth grade had the highest lifetime intercourse rate as compared to the control and the *HFL* Intensive intervention. Also students in eighth grade in the *HFL* Intensive intervention demonstrated higher rates of intercourse in the preceding month as compared to control. Liebermann et al.²³ showed a short-term increase in initiation of intercourse for male participants although this was no longer significant at long-term follow up.

Abstinence-Only Sexual Education

Of the reviewed literature on Abstinence-Only sexual education, eight evaluations showed an increase in knowledge. In Jemmott et al.,³⁴ the abstinence group showed an increase in knowledge regarding condom use, HIV prevention and risk reduction. Trenholm et al.²⁶ demonstrated an increase in the correct identification of STDs in the four studied programs. Maynard et al.²⁵ showed that when evaluated overall, the programs studied showed an increase in pregnancy and STD risk knowledge. When looked at specifically *My Choice, My Future* showed increased pregnancy and STD risk knowledge, increased knowledge regarding peer relations and risk avoidance skills as well as increased awareness of perceived general and personal consequences of both teen and non-marital intercourse. At the four to six year follow up, Trenholm et al.²⁶ found that *My Choice, My Future* was the only program that showed an increase in knowledge of STD and pregnancy risks, increased knowledge of unprotected sex risks and an increased number of correctly identified STDs.

When evaluated by Maynard et al.²⁵, *Teens in Control* showed an increase in knowledge regarding the risk of pregnancy and STDs and risk avoidance skills. *ReCapturing the Vision* also showed an increase in the knowledge regarding risk avoidance skills, in addition to increased awareness of general and personal consequences of teen and non-marital intercourse. Blake et al.²⁷ and Borawski et al.²⁸ both showed significant increases in knowledge of their participants. Barnett et al.²⁹ found increases in knowledge in both evaluation one and evaluation two. Denny et al.³¹ found increases in upper elementary students. Denny et al.³² found these increases to remain significant for upper elementary students at the 18 month follow up and found them become significant for high school participants at this follow up as well.

Many of the studies showed gains in positive attitudes regarding abstinence. The abstinence group evaluated by Jemmott et al.³⁴ showed less favorable attitudes regarding intercourse, while Kirby et al.²⁴ and Blake et al.²⁷ found participants had increased beliefs that they and their peers supported abstinence. Maynard et al.²⁵, *Teens in Control*, and Denny et al.³¹, with high school students, reported increased attitudes supportive of abstinence. *My Choice*, *My Future* and *ReCapturing the Vision* showed increased views unsupportive of teen sex.²⁵ Borawski et al.²⁸ showed participants increased support of abstinence until older or married. Barnett et al.²⁹ reported that 10th grade males in evaluation one became more abstinence oriented and more students chose abstinence as the preferred answer as the best way to avoid STDs and unwanted pregnancy.

Frequently, more positive views of abstinence are related to decreased intention to participate in intercourse. This is demonstrated in Jemmott et al.³⁴, Borawski et al.,²⁸ and Kirby et al.²⁴ Blake et al.²⁷ specifically found this in the results from the *MPM-enhanced* group. Denny et al.^{31, 32} found high school students reporting an increased intent to remain abstinent and Doniger et al.³³ found an increase from Wave 1 to 2 in the number of participants who stated that they “should wait until they can support a baby “before they had intercourse.

Other effected attitudes include an increased number of participants that correctly perceived birth control pills as being ineffective at protecting against STDs as reported in Trenholm et al.²⁶ Increased self-efficacy for refusal of intercourse was reported by Kirby et al.²⁴ for the adult led group at three months, by Blake et al.²⁷ in the *MPM-enhanced* participants, and by Denny et al.,³¹ among upper elementary students. Doniger et al.³³ showed an increase in the number of students who felt they would not be pressured into having intercourse and who felt they could break up with the person that pressured them.

Six Abstinence-Only sexual education studies showed a change in behaviors regarding decreased sexual intercourse. Jemmott et al.³⁴ showed decreased frequency of intercourse at three months, but not six and twelve months. In Trenholm et al.²⁶, *ReCapturing the Vision* demonstrated increased abstinence, although the finding was not significant. Borawski et al.²⁸ demonstrated decreased intercourse of participants in the preceding five months, while Denny et al.³² reported decreased intercourse for upper elementary students and middle school students within the last month and ever. Doniger et al.³³ showed a decrease in frequency of self-reported sex by age 15 which declined significantly from 46.6% to 37.8% to 31.6% for survey years 1992, 1995, 1997, respectively. There was also a decrease in frequency of self-reported intercourse by age 17. Although not significant, the intercourse rate declined from 53.9% to 50.4% to 51.4% for survey years 1992, 1995, 1997, respectively.

Maynard et al.²⁵ showed increase abstinence pledging in *My Choice, My Future*, *ReCapturing the Vision* and *FUPTP*. Increased condom usage was seen in Jemmott et al.³⁴ at the 12 month follow up. Doniger et al.³³ showed decreased pregnancy rates in Monroe County, New York. In 1996, the pregnancy rate was lower than the comparison areas and it was a significantly steeper downward trend than four of the five surrounding geographic areas.

Four of these Abstinence-Only studies revealed unexpected results. Kirby et al.²⁴ found that the youth led intervention had increased pregnancy rates, although this was only seen in one seventh grade classroom, among one group of male participants. This intervention also found that those in the adult led group had significantly higher STD rates.²⁴ Trenholm et al.²⁶ reported a decrease in the perceived effectiveness of condoms against STDs overall and specifically for the *My Choices, My Future* program. Borawski et al.²⁸ found a decrease among sexually inexperienced students in their intention to use condoms in the future. Barnett et al.²⁹ found that

the eighth grade females from evaluation one had attitudes less favorable of abstinence. Evaluation one also showed a significant increase in sexual behavior for both genders, although this was found to be greater for males than females.

Weaknesses/Gaps in the Literature

One of the major weaknesses of the literature reviewed is the lack of randomized control trials and head-to-head trials. While there were eight randomized control trials available for evaluation of Comprehensive sexual education there were only four Evidence Level I studies available for review of Abstinence-Only sexual education. It is necessary for more randomized control trials to be completed in order to further evaluate the effectiveness of these programs.

Furthermore, Jemmott et al.³⁴ was the only evaluation that directly compared an Abstinence-Only sexual education program with a Comprehensive sexual education and then compared them to a control group. The other Evidence Level I and Level II-1 studies compared the sexual education program being evaluated to a control program that was frequently the sexual education program normally taught in the school. In future studies it would be more beneficial for researchers to directly compare an Abstinence-Only sexual education program and a Comprehensive sexual education program, in a similar format to that used by Jemmott et al.³⁴

Another weakness found in the literature is that a small number of the studies have long-term follow ups that are greater than one year. Only two of the studies followed a sexual education program for more than two years. Trenholm et al.²⁶ followed the Abstinence-Only programs for a four to six year follow up and the *Safer Choices* evaluation lasted for thirty-one months.¹⁵⁻¹⁷ It is very important that these programs be evaluated long-term in order to determine if the short-term effects on the behaviors, attitudes and knowledge of adolescents will continue.

While some of the studies were started in middle school or upper elementary, often times the results found from the high school programs may be skewed due to previous sexual education teachings. It would be beneficial to both participants and researchers for these sexual education programs to be started during the upper elementary and middle school years and continued into high school to determine the long-term effects from either the Abstinence-Only or Comprehensive sexual education program being evaluated.

Another limitation of the studies is that the only type of sexual activity asked about was vaginal intercourse. It is important for researchers to ask about other types of sexual behaviors, such as genital play, oral intercourse, anal intercourse, and homosexual sexual behaviors to better understand the overall sexual behaviors of adolescents. These behaviors often precede vaginal intercourse and can often times be predictors of earlier transition into vaginal intercourse as demonstrated in findings from the *HFL* program²⁰. Also, by determining the prevalence of these behaviors, schools and communities will be better equipped to tailor sexual education programs to fit the needs of their students.

CHAPTER V

CONCLUSION

After a thorough review of the literature, the strongest evidence supports Comprehensive sexual education as having the greatest impact on the knowledge, attitudes, and behaviors of adolescents when compared to Abstinence-Only sexual education. Two Comprehensive sexual education Evidence Level I studies showed a delay in the initiation of intercourse among participants.^{9, 15} Comprehensive sexual education also had more Evidence Level I studies that demonstrated participants with higher rates of condom use and fewer instances of self reported unprotected sexual behavior. These findings were among both sexually experienced and sexually inexperienced participants. When compared directly in an Evidence Level I study, Comprehensive sexual education demonstrated more long-term effects on adolescents than did Abstinence-Only sexual

education. Based on the reviewed literature Comprehensive sexual education is given a B recommendation.

Abstinence-Only sexual education showed few long-term effects on the

Strength of Recommendation ⁴⁹	Definition	Implication for Practice
A	Recommendation based on consistent and good quality patient-oriented evidence.	You should do this unless there is a compelling reason not to.
B	Recommendation based on inconsistent or limited quality patient-oriented evidence.	You should strongly consider doing this.
C	Recommendation based on consensus, usual practice, opinion, disease-oriented evidence, and case series for studies of diagnosis, treatment, prevention, or screening.	The evidence that this improve patient outcomes is weaker for this recommendation.

behaviors of adolescents. There were also fewer Evidence Level I evaluations that had been performed on Abstinence-Only sexual education programs. The review of the literature found that Abstinence-Only sexual education had more of an impact with regards to knowledge and a

small impact on the attitudes of the participating adolescents. As a result of these findings, Abstinence-Only sexual education is given a C recommendation.

Based on the literature concerning both types of sexual education, the teaching of Comprehensive sexual education currently appears to be the most effective method available. It is, however, recommended that more direct comparison studies and randomized control trials be completed regarding both types of sexual education. Before implementing any sexual education program into a school, it is important for the program to be tailored to fit the needs of the communities, ages and genders in which it is to be used in order for the program to have the strongest and longest lasting effect.

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APPENDIX A: COMPREHENSIVE SEXUAL EDUCATION STUDIES

Study (Author, Program)	Participants	Effect on Knowledge	Effect on Attitudes	Effect on Behaviors	Level of Evidence
<i>Safer Choices</i> Coyle et. al. ¹⁴	3,869 High School students from Texas and California	7 mo - ↑'d knowledge significantly re: HIV and other STD California > Texas	- ↑'d positive attitudes toward condom usage - no difference in attitudes regarding sexual intercourse - ↑'d condom use self-efficacy scores - ↑'d risk perception regarding HIV and STDs	sexually experienced students - ↓'d unprotected intercourse in preceding 3 mo - ↑'d condom usage and effective pregnancy prevention method - no difference seen in initiation of intercourse, number of sexual partners or substance use before intercourse	I
<i>Safer Choices</i> Basen-Engquist et al. ¹⁶	3,869 High School students from Texas and California	19 mo - significantly ↑'d knowledge related HIV (all grades) and STDs (9 th grade), 31 mo - ↑'d HIV knowledge (all grades)	19 mo - ↑'d condom self-efficacy (9 th and 10 th graders) - ↑'d positive attitudes of social norms related to condoms - ↑'d self-efficacy for refusing sex and communication with parents 31 mo - ↑'d condom self-efficacy (10 th and 11 th graders)	19 mo - ↓'d instances of unprotected sex (overall and 9 th grade) - no diff in # of students having intercourse in, # of sexual partners, or frequency of intercourse in preceding 3 mo - no differences in secondary behavioral measures (use of condom or contraceptive method at last intercourse, use of drugs or alcohol before sexual intercourse in preceding 3 mo, ever had an HIV or STD test) 31 mo	I

				<ul style="list-style-type: none"> - no significant ↓ in # of students having intercourse in preceding 3 mo - ↓'d rate of unprotected intercourse (overall and 9th and 11th graders) 	
<p><i>Safer Choices</i> Coyle et al.¹⁷</p>	<p>3,869 High School students from Texas and California</p>	<ul style="list-style-type: none"> - ↑'d HIV and other STD knowledge 	<ul style="list-style-type: none"> -↑'d positive attitudes regarding condoms, condom use self-efficacy, - ↑'d levels of perceived risk of HIV and other STDs -↑'d normative beliefs about condom use and more communication with parents - no difference in regarding attitudes and normative beliefs about sexual intercourse, self-efficacy to refuse sex or self-efficacy to communicate with a partner about sexual limits 	<ul style="list-style-type: none"> - ↓'d unprotected intercourse by sexually experienced students - no difference in incidence of sexual initiation at 31 mo - students who had intercourse in the preceding 3 mo were: <ul style="list-style-type: none"> 1.68 x more likely to use a condom 1.76 x more likely to use an effective pregnancy prevention method at last intercourse - no differences in remaining secondary behavioral outcomes seen 	<p>I</p>

<p><i>Safer Choices</i> Kirby et al.¹⁵</p>	<p>3,869 High School students from Texas and California</p>	<p>Not measured</p>	<p>Not measured</p>	<ul style="list-style-type: none"> - no delay in onset of intercourse but ↑'d condom usage - reduced frequency of unprotected sex and # of partners involved in unprotected sex - ↑'d condom usage and ↑'d contraceptive use - no gender interaction was seen regarding initiation of intercourse - greater effect on program males on all 4 measures involving condom use (# of times of unprotected sex, number of partners unprotected, ↑'d condom use at last sex and ↑'d contraceptive use at last sex) - only ↓'d times of unprotected sex was significant for females although all were in desired direction - Only delayed initiation of intercourse for Hispanic students, not Blacks, Asians, or Whites - ↑'d condom usage among Hispanics and whites than blacks 	<p>I</p>
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				<ul style="list-style-type: none"> - no significant subgroup differences were detected regarding 3 condom related measures - significantly > impact on youth who initiated intercourse after baseline than sexually experienced youth regarding frequency of unprotected sex - Condom and/or contraceptive use at last intercourse was most significant for sexually experienced youth 	
<p><i>SNAPP</i> Kirby et al.¹⁸</p>	<p>1,657 Middle School students from Hollywood-Wilshire and Central Los Angeles</p>	<p>5 mo - ↑'d mean knowledge 17 mo - ↑'d knowledge with greatest impacts regarding a) whether health clinics need parental permission to give students birth control or treat for HIV or STD if under age 18 b) whether a student could still obtain an STD if using BCP</p>	<p>- no differences seen at 5 or 17 mo regarding when teens should initiate sex, self-efficacy to avoid sex or unprotected sex, reasons to or not to have sex, reasons to or not to use a condom.</p> <p>- only significant differences were seen in a) the willingness to have an HIV positive friend (significant at 5mo) b) belief that peers believed one should always use a condom during sex (significant at 17mo)</p>	<ul style="list-style-type: none"> -no differences in initiation of intercourse - no differences in rate of intercourse in preceding 3 and 12 mo, # of sexual partners in preceding 12 mo. - no differences in the proportion of students who used alcohol or drugs before last sex - no differences in use of condoms or use of birth control pills at last intercourse - no impact on pregnancy or STD rates - ↓ in amt of participants that used BCPs at last intercourse 	<p>I</p>

<p><i>Client Centered Pregnancy Prevention Program</i></p> <p>McBride et al.¹⁹</p>	<p>1,042 youth (ages 9-13) and 690 teens (ages 14-17) in 7 communities in Washington</p>	<p>Not measured</p>	<p>- Site C and E had significantly ↓'d intentions in having intercourse</p> <p>- No effects on sites F and G's intentions to use contraceptives, E had a higher mean score but not significant</p>	<p>- Site F significantly ↓'d rate of sexual behavior</p> <p>- Site F showed ↑'d and consistent contraceptive use at last intercourse</p>	<p>I</p>
<p><i>Healthy For Life (HFL) Project</i></p> <p>Moberg et al.²⁰</p>	<p>2,483 students grade 6-10 in Wisconsin</p>	<p>Not measured</p>	<p>Not measured</p>	<p>- 10th grade students in age appropriate HFL highest lifetime intercourse and control group lowest</p> <p>- 8th grade students in intensive condition higher rates of intercourse in the past month</p> <p>- no difference condom use</p> <p>- pre-test involvement with opposite sex, significant predictor of students who had sex ever or in past month</p> <p>- both HFL conditions ↑'d likelihood of intercourse ever by 9th grade</p> <p>- HFL students more likely to report sex ever, no ↑ in regular sexual behavior</p> <p>- consistent condom use by 9th grade significantly ↑'d only as function of pretest involvement with opposite sex</p>	<p>I</p>

<p><i>Postponing Sexual Involvement (PSI) and Self Center</i></p> <p>Aarons et al.⁹</p>	<p>812 junior high students in Washington D.C</p>	<p>- females had ↑'d knowledge of reproductive health service scales at end of 8th grade - males had ↑'d knowledge on birth control in all 3 f/.u surveys</p>	<p>Females - ↑'d # said they would abstain from intercourse in next 6 mo, only significant at end of 7th grade - ↑'d % of females believed that their peers were not having sex, significant at end of 7th grade - ↑'d self-efficacy in refusal of intercourse, only significant at end of 7th grade Males - no differences in believing peers were sexually active - ↑'d positive attitudes toward delayed childbearing at end of 7th grade and beginning of 8th grade</p>	<p>Females - ↑'d virginity rates, significant at end of 8th grade - ↑'d # of females used some form of birth control</p>	<p>I</p>
<p><i>Rochester AIDS prevention project (RAPP)</i></p> <p>Aten et al.²²</p>	<p>1352 middle school students in Rochester, NY</p>	<p>not measured</p>	<p>not measured</p>	<p>Females - no differences between the adult and teacher taught Males - ↓'d initiation of sexual activity - significant effects on abstinent males <13</p>	<p>II-1</p>
<p><i>Education Now and Babies Later (ENABL)</i></p> <p>Arnold et al.²¹</p>	<p>1450 middle schools students in Florida</p>	<p>Significant ↑ in scores regarding knowledge and attitudes</p>	<p>Measured with knowledge</p>	<p>Not measured</p>	<p>II-1</p>

<p><i>Project IMPPACT</i></p> <p>Liebermann et al.²³</p>	<p>312 middle school students in New York City</p>	<p>Not measured</p>	<ul style="list-style-type: none"> - no short term differences in attitudes regarding teens having sex or intentions to have sex - no significant long-term differences regarding intentions to have sex or attitudes regarding teen pregnancy - Differences in long-term attitudes from males regarding intercourse 	<ul style="list-style-type: none"> - males showed short term increase in initiation of intercourse - no long-term differences in initiation of intercourse for males and females - no difference in condom usage - no difference in 1 yr pregnancy rates 	<p>II-1</p>
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APPENDIX B: ABSTINENCE-ONLY SEXUAL EDUCATION STUDIES

Study (Author, Program)	Participants	Effect on Knowledge	Effect on Attitudes	Effect on Behaviors	Level of Evidence
<p><i>PSI</i> Kirby et al.²⁴</p>	<p>10,600 youths (mean 12.8) from California</p>	<p>Not measured</p>	<ul style="list-style-type: none"> - At 3 mo, youth led intervention believed they and their peers endorsed postponing sex, not significant at 17 mo - youth and adult led were less likely to believe becoming sexually active during teenage years was inevitable, significant at 3 mo not at 17 mo - no differences at 3 and 17 months regarding beliefs of sexual pressures - At 3 mo, adult led reported significantly more reasons to abstain from sex - no differences in # of reasons or conditions which youth said they would engage in sex at 3 and 17 mo - no differences at 3 or 17 mo in youth's belief that the media have no influence on their behavior - adult led group ↑'d self-efficacy at sex refusal, significant at 3 but not 17 mo - no significant differences at 	<ul style="list-style-type: none"> - no differences at 3 or 17 mo in level of communication with parents - no differences in setting sexual limits, intention to avoid sex, in sexually inexperienced youth declining to wait until they are older to have sex or in sexually experienced youths deciding to abstain from intercourse until older - at 3 mo youth led and adult were more likely to report intending to refuse sex control - at 3 and 17 mo, no significant differences in attempts to persuade others to engage in intercourse - no differences in initiation of intercourse at 3 or 17 mo for sexually inexperienced youth - no difference at 3 or 17 mo in frequency of intercourse or # of sexual partners among sexually experienced students - no differences regarding condoms or birth control pills - no differences in pregnancy 	<p>I</p>

			3 or 17 mo in beliefs they could demonstrate affections without having sex	<p>rates of adult led group</p> <ul style="list-style-type: none"> - youth led had ↑'d pregnancy rates (this was seen among in 1, 7th grade classroom. - no differences in STD reporting among youth led - adult led had significantly ↑'d STD rates 	
<p><i>My Choice, My Future</i></p> <p><i>Recapturing the Vision</i></p> <p><i>Teens in Control</i></p> <p><i>Families United to Prevent Teen Pregnancy (FUPTP)</i></p> <p>Maynard et al.²⁵</p>	<p>517, 8th graders in Powhatan, VA</p> <p>545, 6-8th graders in Miami, FL</p> <p>809, 5th graders in Clarksdale, MS</p> <p>439, 3rd-8th graders in Milwaukee, WI</p>	<ul style="list-style-type: none"> - ↑'d pregnancy and STD risk knowledge, ↑'d knowledge regarding peer relations and risk-avoidance skills in <i>My Choice, My Future</i> - ↑'d knowledge of pregnancy and STD risks and risk avoidance skills in <i>Teens in Control</i> - ↑'d knowledge regarding risk-avoidance skills, but no difference related to pregnancy and STD risks, and peer relations in <i>ReCapturing the Vision</i> 	<ul style="list-style-type: none"> - <i>Teens in Control</i> had ↑'d views supportive of abstinence, the other 3 did not - only <i>My Choice, My Future</i> and <i>ReCapturing the Vision</i> showed ↑'d views unsupportive of teen sex - no differences in any of the programs in views supportive of marriage - no differences in peer influences and relations or self-concept - <i>My Choice, My Future</i> and <i>ReCapturing the Vision</i> showed ↑'d awareness of perceived general and personal consequences of teen and non-marital sex, no differences for other 2 programs 	<ul style="list-style-type: none"> - <i>My Choice, My Future, ReCapturing the Vision</i> and <i>FUPTP</i> had ↑'d abstinence pledge rates - no differences in refusal skills and communication with parents 	I

		- No differences seen for <i>FUPTP</i>	- No differences seen in <i>ReCapturing the Vision</i> and <i>My Choice, My Future</i> regarding expectations to abstain from intercourse until marriage or as an unmarried teen, this was not measured in <i>Teens in Control</i> and <i>FUPTP</i>		
<p><i>My Choice, My Future</i></p> <p><i>ReCapturing the Vision</i></p> <p><i>Teens in Control</i></p> <p><i>Families United to Prevent Teen Pregnancy (FUPTP)</i></p> <p>Trenholm et al.²⁶</p>	<p>448, 8th graders in Powhatan, VA</p> <p>480, 6-8th graders in Miami, FL</p> <p>715, 5th graders in Clarksdale, MS</p> <p>414, 3rd-8th graders in Milwaukee, WI</p>	<p>- ↑'d # of correctly identified STDs</p> <p>- no difference in knowledge of unprotected sex risks</p> <p>- ↓'d knowledge of STD consequences (not significant)</p> <p><i>My Choice, My Future</i></p> <p>- ↑'d knowledge of STD and pregnancy risks</p> <p>- ↑'d knowledge of unprotected sex risks and the potential health risks of STDs</p> <p>- ↑'d correctly identified STDs</p>	<p>- ↓'s perceived effectiveness of condoms against STDs</p> <p>- ↑'d participants correctly perceived the effectiveness of birth control pills against STDs</p> <p><i>My Choice, My Future</i></p> <p>- ↑'d perception of effectiveness of birth control pills and ↓'d perceived effectiveness of condoms against STDs</p>	<p>- no difference in sexual abstinence, unprotected sex, age at first intercourse, and # of sexual partners</p> <p>- <i>ReCapturing the Vision</i> had ↑'d sexual abstinence but this was not significant</p>	I

<p><i>Managing the Pressures Before Marriage (MPM)</i></p> <p>Blake et al.²⁷</p>	<p>351 middle school students outside Rochester New York</p>	<p>- ↑'d knowledge of effectiveness of abstinence as prevention strategy</p> <p>- no difference in knowledge for <i>MPM-only</i> vs. <i>MPM-enhanced</i></p>	<p>- ↑'d belief of peers supporting abstinence and the influence from the media on adolescent sexual behavior</p> <p>- ↑'d self-efficacy for sexual avoidance or refusal</p> <p>- ↓'d intentions to have intercourse before high school</p> <p>- no difference in <i>MPM-only</i> vs <i>MPM-enhanced</i> with respect to attitudinal variables except <i>MPM-only</i> were more likely than those in the enhanced to agree that adolescents who have sex will always expect to have sex in their next relationship</p> <p>- <i>MPM-enhanced</i> expressed ↑'d self-efficacy with regard to refusing or avoiding substance use and sexual behavior</p> <p>- <i>MPM-enhanced</i> had ↓'d intentions to have sex before completing high school</p>	<p>-<i>MPM-enhanced</i> showed ↑'d communication with parents on prevention strategies, consequences of sexual intercourse, and also class lessons</p> <p>- no differences in exposure to high risk situations, refusal when exposed to high risk sexual situations or lifetime or recent sexual intercourse</p>	<p>I</p>
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<p><i>For Keeps</i> Borawski et al.²⁸</p>	<p>2069 middle school students from the Midwest</p>	<p>- ↑'d knowledge in HIV/STD knowledge - this did not differ by gender or sexual experience at baseline</p>	<p>- ↑'d belief in being abstinent until older and abstinent until marriage - this was associated with being female and sexually inexperienced at baseline - ↑'d confidence regarding resisting sexual advances and in the ability to obtain and use a condom</p>	<p>- ↓'d intention to have sex in next 3 mo and year - ↓'d intention to use a condom in the future (this was only among sexually inexperienced students) 5 mo - no differences in reporting of intercourse during the 5 mo period - ↓'d episodes of intercourse and fewer partners in preceding 5 mo</p>	<p>II-1</p>
<p><i>Life's Walk</i> Barnett et al.²⁹</p>	<p><u>Evaluation 1</u> 271 students in grades 8 and 10 in Northwest Missouri</p> <p><u>Evaluation 2</u> 86 students in grade 8 in Northwest Missouri</p>	<p><u>Evaluation 1</u> - ↑'d knowledge, with 10th graders > 8th graders</p> <p><u>Evaluation 2</u> - ↑'d knowledge</p>	<p><u>Evaluation 1</u> - marginally significant ↑ in attitudes (become less abstinence-oriented) among 8th grade females - marginally significant decrease (becoming more abstinence-oriented) for 10th grade males</p> <p><u>Evaluation 2</u> - no differences in attitudes - a significant difference was seen in the best way to avoid STDs with an ↑'d # choosing abstinence - a significant difference was seen in the best way to prevent an unwanted pregnancy with an ↑'d # choosing abstinence</p>	<p><u>Evaluation 1</u> - ↑'d parent-adolescent communication - ↑ in sexual behavior, ↑ for both genders but males>females</p> <p><u>Evaluation 2</u> - no significant differences - ↑'d parent-adolescent communication about non-sexual issues - no group differences seen</p>	<p>II-1</p>

<p><i>Family Accountability Communicating Teen Sexuality (FACTS) and Why Am I Tempted (WAIT)</i></p> <p>Sather et al.³⁰</p>	<p>132 middle school students in Nebraska</p>	<p>Not measured</p>	<p>- no differences in attitudes regarding: premarital sex, intentions whether to engage or not engage in premarital sex, or have sex as an unmarried teen</p>	<p>Not measured</p>	<p>II-1</p>
<p><i>Sex Can Wait</i></p> <p>Denny et al.³¹</p>	<p>301 upper elementary students (5th-6th grade) 606 junior high students (7th-8th grade) 1195 high school students (9th-12th grade) in 15 school districts</p>	<p>- ↑'d knowledge at Upper Elementary level but not at Middle School or High School Level</p>	<p>Upper Elementary - ↑'d attitudes regarding self-efficacy Middle School - no differences seen High School - ↑'d attitudes supportive of abstinence and ↑'d intent to remain abstinent</p>	<p>No behavioral changes (decision making) seen at any level</p>	<p>II-2</p>

<p><i>Sex Can Wait</i> Denny et al.³²</p>	<p>301 upper elementary students (5th-6th grade) 606 junior high students (7th-8th grade) 1195 high school students (9th-12th grade) in 15 school districts</p>	<p>Upper Elementary -↑'d knowledge Middle School - no differences High School - ↑'d knowledge</p>	<p>Upper Elementary - no differences seen Middle School - no differences High School - ↑'d intent to remain abstinent</p>	<p>Upper Elementary -↓'d participation in sexual intercourse Middle School - ↓'d participation in sexual intercourse ever and in the last month High School - at baseline showed they were less likely to report participation in intercourse in the last month and ever - at 18 mo follow up this result was no longer significant</p>	<p>II-2</p>
<p><i>Not Me, Not Now</i> Doniger et al.³³</p>	<p>1994- 400 elementary age students 1995-1999 500-1000 middle school students per year in Monroe County, NY</p>	<p>Not measured</p>	<p>- ↑ # of respondents that said they should they “should wait until they can support a baby” before they have intercourse (wave 1 to 2) - # of participants who say they can handle the consequences of sexual intercourse ↓'d from 34% to 27% (wave 1 to 2) to 22% (wave 3) - # of participants who would not be pressured into sex ↓'d 21% to 18% (wave 1 to 2), the response to break up ↑'d from 27% to 31% (wave1- 2)</p>	<p>- no changes in parent-child communication - ↓ in frequency of self-reported sex by age 15, declined from 46.6 to 37.8 to 31.6 for survey years 1992, 1995, 1997 (significant all years) - ↓ frequency of self reported sexual behavior by age 17, declined from 53.9, 50.4, 51.4 for survey years 1992, 1995, 1997 – not statistically significant Pregnancy Rates - 1993 Monroe Co had higher</p>	<p>II-3</p>

				<p>rate than Upstate NYS and the 2 Upstate counties</p> <ul style="list-style-type: none">- by 1996 the rate was lower than the comparison areas and it was a significant downward trend for 4 of the 5 surrounding geographic areas.- the slope of the trend line was steepest for Monroe Co and was significantly steeper than the regression line for the 3 comparison areas	
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APPENDIX C: COMPARISON STUDY

Study (Author, Program)	Participants	Effect on Knowledge	Effect on Attitudes	Effect on Behaviors	Level of Evidence
Jemmott et al. ³⁴	659 Middle School students in Philadelphia, PA	<ul style="list-style-type: none"> - Safer Sex Group and Abstinence Group showed ↑'d knowledge immediately after intervention regarding condom use, HIV prevention and risk reduction compared to control - Safer Sex group scored significantly higher than Abstinence group 	<p>Abstinence Group</p> <ul style="list-style-type: none"> - believed abstinence would prevent pregnancy and AIDs - less favorable attitudes regarding intercourse - weaker intentions to engage in intercourse in following 3 months - believed practicing abstinence would help them achieve career goals <p>Safer Sex Group</p> <ul style="list-style-type: none"> - believed condoms can prevent pregnancy, STDs, and HIV - greater confidence in impulse control - greater self-efficacy in condom usage 	<p>Abstinence group</p> <ul style="list-style-type: none"> - significantly ↓'d intercourse at 3 mo f/u, but not at 6 or 12 mo - ↑'d condom use at 12 mo <p>Safer Sex group</p> <ul style="list-style-type: none"> - ↑'d and more consistent condom use at 3, 6, and 12 mo - ↓'d intercourse at 3 mo, marginally less at 6 mo - among sexually experienced students- ↓'d intercourse and ↑'d condom use at 6 and 12 mo. 	I

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