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REVIEW ARTICLE

# Abstinence-Based Programs for Prevention of Adolescent Pregnancies

## *A Review*

MARK H. THOMAS, M.D.

With over 1 million pregnancies each year to teenage mothers (1) and approximately one-quarter of the 12 million cases of sexually transmitted diseases in the country each year occurring in adolescents (2), the need to change adolescent sexual behaviors is obvious. One approach to these problems that is gathering much support is abstinence. The concept of abstinence embraces both primary abstinence, refraining from sexual intercourse by an individual who has never experienced it, and secondary abstinence, or discontinuation of sexual intercourse among those already sexually experienced.

This article briefly reviews the federal government's abstinence promotion activities. It examines the abstinence-based programs developed by family life educators and others that have been evaluated and summarizes the factors associated with positive results. Other abstinence programs currently being implemented in different fields but not yet evaluated are also described.

### *Federal Government's Abstinence Promotion Activities*

In 1996, Congress added Section 510 to Title V of the Social Security Act. This section allocated $50 million per year from 1998 through 2002 to fund state programs providing abstinence education. These funds can be used by the states for instructional programs and programs in mentoring, counseling, or providing adult supervision to those groups most likely to bear children out of wedlock. Abstinence education is defined as teaching the benefits of abstinence in terms of social, psychological, and health gains, as well as the potential harmful consequences of sexual activity and childbearing outside of the context of marriage. Section 510 also stresses that programs should advocate abstinence as the social norm for all school-age children. Programs are to advocate a mutually faithful monogamous relationship in the context of marriage as the standard of human sexual activity, to teach skills in rejecting sexual advances, and to inform students that alcohol and drug use may lead to vulnerability to such advances (3).

The Department of Health and Human Services (DHHS) showed its support for abstinence by including it in the health objectives for the year 2000. Among the *Healthy People 2000* goals are to reduce the percentage of adolescents engaging in sexual intercourse to no more than 15% by age 15 years and no more than 40% by age 17 years, and to increase to at least 40% the proportion of sexually experienced adolescents who are currently practicing abstinence (4).

In January 1997, DHHS, through the oversight of the Office of Adolescent Pregnancy Prevention (OAPP), launched a National Strategy to Prevent Teen Pregnancy, a comprehensive plan to prevent

*From the Department of Pediatrics, Division of General Pediatrics and Adolescent Medicine, University of Alabama School of Medicine, Birmingham, Alabama*

*Address reprint requests to: Mark Thomas, M.D., Division of General Pediatrics and Adolescent Medicine, 1600 Seventh Avenue South, ACC Suite 512, Birmingham, AL 35233.*

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teen pregnancies and to support and encourage adolescents to remain abstinent. One of its goals is to assure that at least 25% of communities have teen pregnancy prevention programs. The Strategy encourages abstinence with a national media campaign seeking to involve parents and other adults and through educational programs such as "Girl Power!" which targets 9- to 14-year-old girls (5).

## *Evolution of Pregnancy-Prevention Programs*

The first generation of adolescent pregnancy prevention programs began in the 1970s with a focus upon increasing knowledge about sex and the risks and consequences of teen pregnancy. The second generation of programs included similar information but placed greater emphasis upon values-clarification and skills in decision-making and communication. The evaluations of these programs were unable to demonstrate a lessening of sexual risk-taking behaviors in their target audience (6–8). In reaction to these programs and partly owing to a change in the political climate of the nation, a third generation of programs stressing abstinence to the exclusion of information about contraception was promoted by the Adolescent Family Life Act of 1981 (Title XX) (6,7,9). The fourth-generation programs were essentially syntheses of the previous three generations. Emphasizing prevention of human immunodeficiency virus (HIV) transmission, these programs combined a strong abstinence message with training in communication and negotiation skills as well as instruction in sexuality and contraceptives. These programs were better grounded in theoretical approaches to behavior change and were generally subjected to evaluations that were more rigorous (7).

## *Rationale for Abstinence-Based Programs*

The principal rationale for abstinence is that it provides the only absolute protection against teen pregnancy and sexually transmitted diseases. In addition, programs that emphasize only abstinence as a means of birth control may be seen as sending a more consistent message to adolescents involved in sexual decision-making (7). It is also believed that abstinence provides buffering from the psychosocial and emotional harm resulting from premature sexual relationships (10,11). Several abstinence-advocating programs suggest that adolescents are not able to understand fully the implications of their sexual activities, nor are they mature enough to deal with the consequences of sexual intercourse. The mission statement of one program states, "the needs that young people seek to meet through sexual intercourse could best be met in other ways." Furthermore, teenagers are often pressured into sexual behaviors in which they really do not want to engage. They require awareness of sexual pressures and of skills needed to resist them. They may respond most favorably to programs that equip them to say "no" (12).

Once teens begin having intercourse, they are likely to continue. Thus, the most effective programs target teens before they begin having intercourse and influence them to postpone sexual involvement. Some researchers believe that early and middle adolescents are at a developmental stage characterized by immature processing of information and failure to anticipate future outcomes of actions. This makes it difficult for them to understand and use contraceptive methods effectively and consistently (7,12).

Social pressures often cause precocious adolescent sexual behavior. In one poll, adolescents 12–17 years of age identified the pressure to have sex as the number one threat to their well being (13). Adolescents have voiced a desire for knowledge and skills to resist the social pressure of having intercourse before they are ready. A poll of 1000 adolescent girls in an adolescent clinic in Atlanta found that the topic they most desired to have addressed was how to say no to a boyfriend's requests for sex without losing the boyfriend or hurting his feelings (endorsed by 84%) (12).

## *Evaluated Programs*

In this review, abstinence-based programs will be divided into programs that discuss abstinence-only as their approach to preventing pregnancy and sexually transmitted diseases in adolescents ("Abstinence Only") and ("Abstinence Plus") programs that include other prevention methods such as contraception, in addition to a strong emphasis on abstinence. Details of each program and the corresponding evaluations are listed in Table 1.

### Abstinence Only Programs

Success Express is a school-based program that targets low-income, minority, middle school students, and was subsidized by funding provided by the Office of Adolescent Pregnancy Prevention (OAPP). (The contents and format of the curriculum are

**Table 1.** Program Components, Outcomes, and Evaluations

| Program | Program Components | Evaluation Sample | Outcome Measures | Outcomes | Evaluation Strengths and Weaknesses |
|---|---|---|---|---|---|
| Success Express | 6 sessions over 6 weeks of unspecified length. Topics: self-esteem, family values, life goals, social pressures, adolescent growth, and reproductive knowledge, attitudes toward abstinence, how to say no, consequences of sex | 5 middle schools and 3 community sites. Hispanic (69%)/Black (21%)/White (8%), Average age: 12.8 years old. $n = 191$ treatment/129 control | Self-esteem. Attitude toward appropriate age of 1st intercourse/marriage, family communication, sexual activity–coital and precoital, friends' sexual involvement | No differences between control and participants in self-esteem, family communication, attitude toward age of 1st intercourse/marriage, friends' sexual involvement. Increase in precoital sexual activity for participants/not controls (♂ > ♀) | Nonrandom assignment/suspected selection bias. Follow-up too short to measure behavioral changes. Dropout rate 41% for intervention group/30% for controls |
| Project Taking Charge | 6-week curriculum designed for home economics classes. 30 sessions, unspecified length. Topics: self-development, vocational goal setting, sexual education, pregnancy, family values, and communication, development and importance of abstinence prior to marriage. | 91 participants in 7th-grade home economics classrooms in 2 sites. Both groups were 46% male. Treatment group: 37% Black/48% White. Controls: 51% Black/41% White | Self-esteem, knowledge scales, clarity of sexual values, sexual attitudes and intentions, family communication about sex and about vocational choice, educational aspirations | Significant increase (tx vs. control) in knowledge scales maintained after 6 mo. No significant changes in family communication, self-esteem, sexual values clarity, or educational aspirations. Nonsexually experienced in treatment group less likely to have begun intercourse at 6 mo. (23% vs. 50%) | 0% attrition rate. Random assignment. Small sample size. Sample not generalizable. Parental participation rate (range of 0–3 sessions) not matched with adolescents' responses |
| Sex Respect | 10-unit curriculum of unspecified duration. Topics: importance of interpersonal relationships, communication, attitudes and values, decision making, assertiveness, peer-refusal skills and responsibility. Materials: guidebook and introductory session for parents, PSAs, videos, pamphlets, filmstrips, books, posters, shirts and buttons, cartoons | 7th and 10th-grade classes (11th- and 12th-graders included in one district) Suburban Utah school district. Sample size and demographics not reported | Single scale measuring attitudes toward premarital sexual intercourse | Desired change in attitudes scale. (Exact numeric magnitude of change not elucidated.) Greater change among senior high than among junior high students. | Did not include a comparison group. No long-term follow-up. Sample not representative outside of Utah. Attrition rate not reported |

*(continued)*

**Table 1.** Program Components, Outcomes, and Evaluations

| Program | Program Components | Evaluation Sample | Outcome Measures | Outcomes | Evaluation Strengths and Weaknesses |
|---|---|---|---|---|---|
| Teen-Aid | Separate curricula for junior high and high school students. Materials: traditional classroom materials, videos, parent class. 3–6-week course w/ 18 (jr. high)/15 (sr. high) integrated modules. Session length unspecified. Topics: details of human reproduction, fetal development, abortion methods, consequences of sexual activity | 7th- and 10th-grade classes (11th- and 12th-graders included in one district). Suburban Utah school district. Sample size and demographics not reported | Single scale measuring attitudes toward premarital sexual intercourse | Significant desirable attitudinal change found in high school but not in middle school students. (Exact numeric magnitude of change not elucidated.) | Did not include a comparison group. No long-term follow-up. Sample not representative outside of Utah. Attrition rate not reported |
| Values and Choices | 15-hour-long class sessions, supplemental, videotapes, and three parents-only sessions of 2 h each. Material centers around seven values: equality, honesty, respect, responsibility, promise-keeping, self-control, and social justice. Also teaches basic sexuality | 7th and 10th-grade classes (11th and 12th-graders included in one district). Rural Utah school district. Sample size and demographics not reported | Single scale measuring attitudes toward premarital sexual intercourse | Attitudinal changes in the desired direction among high school and middle school girls as well as for middle school boys. (Exact numeric magnitude of change not elucidated.) | Did not include a comparison group. No long-term follow-up. Sample not representative outside of Utah. Attrition rate not reported |
| Facts and Feelings | Home-based intervention. Materials: 6-unit set of in-home videos, brief discussion guides. Topics: "Changes," "Values" "Facts," "Meanings," "Choices," "Skills" (see text for details) | 548 volunteer families in Northern UT. Control/ experimental groups. 93–97% White, 85–88% Mormon. Average youth age 13.9 | Participation in spectrum of teen sexual behaviors, sexual intentions, sexual values, self/peers/family, family communication, frequency/ quality, sexual knowledge, sexual pressure avoidance skills, peer/family influence | Parent–child communication increased at the 3-mo. posttest in the treatment group vs. controls but returned to pretest levels at 12-mo. follow-up. No significant difference between control and the two treatment groups in sexual behavior, in the perceived likelihood to become sexually active in the next year or before marriage, or in teens' abstinence values | Randomization to receive video, video and printed material, or neither. Attrition: 3 study groups 5–10%. Homogeneity of sample (95% of participating adolescents were virgins at the delayed posttest) made behavioral change difficult to measure and results not generalizable |

*(continued)*

**Table 1.** Program Components, Outcomes, and Evaluations

| Program | Program Components | Evaluation Sample | Outcome Measures | Outcome Measurements | Evaluation Strengths and Weaknesses |
|---|---|---|---|---|---|
| Reducing the Risk | 15 class periods over 3 weeks in 10th-grade health course. Student role-playing. Topics: explicit norms against unprotected sexual intercourse, training in life skills, sex education, and contraceptive education. Instructors receive 3-day training session | 46 classes in 13 California high schools. 1033 students. Mean age 15.3 years. 53% female, 62% White/20% Latino | Contraceptive knowledge, peer sexual activity, sexual experience/frequency, contraceptive use, unprotected intercourse pregnancy involvement, family communication | Significant difference in knowledge gains between groups. Among sexually experienced at the pretest, no significant difference in freq. of intercourse/ contraceptive use. Sexually inexperienced treatment group students less likely to initiate intercourse at 18 mo. (29% vs. 38%), less likely to have had unprotected sex at last intercourse (9% vs. 16%). No significant difference in pregnancy involvement nor in intention to avoid unprotected intercourse | Incomplete randomization. Attrition rate of 27%; dropouts at higher risk. Some teachers taught both experimental and control classes. Suspicion of spillover effect |
| Postponing Sexual Involvement (PSI) | Follows 5 classes on human sexuality taught by hospital staff. 5 class sessions 45–60 min in length. Led by senior high role models. Topics: social and peer pressures, skills in assertiveness, decision making, resisting sexual pressure. While abstinence is stressed, information is offered about contraceptive use | Evaluated in Atlanta in cohort of cohort of students, born in 1972 at Grady Hospital, entering eighth grade in 1985. 666 students completed the baseline and immediate posttest 536 (80%) at end of 9th grade 303, (45%) at end of 12th grade. 99% Black. About 50% low income | Initiation of sexual intercourse, frequency of intercourse, pregnancy involvement, contraceptive use/frequency, age at initiation of sex | Sexually inexperienced at program initiation in treatment group less likely to initiate sexual intercourse at end of 8th grade to end of 12th (end 8th grade, 4% vs. 20%, end 9th grade, 24% vs. 39%). Among those initiated intercourse after program began, fewer treatment group having frequent intercourse (39% vs. 55%). Treatment group more likely to discontinue sexual activity, more frequent users of contraception. 33% ↓ in pregnancies among the treatment group ♀s at end 9th and end 12th grade | Random assignment not used. Matched school design. 80% retained at the follow-up at end 9th grade and 45% at end of 12th grade. Differences between dropouts and those retained not reported. Medical records at Grady Hospital were used to validate pregnancy reporting |
| Project ENABL (PSI Replication) | Elements of PSI taught by 28 local contractors. 90% of classes taught by adult rather than youth leaders. Concurrent statewide media campaign. Preceding sex ed sessions from Atlanta PSI not used | 187,000 students in 31 CA counties from 4/92 to 6/94. 7th and 8th-graders. Mean age 12.7–12.9 years. 11% Asian Americans, 12% African Americans, 39% Hispanics, 35% Whites and 1% Native Americans | 3-mo. and 17-mo. follow-up, frequency of intercourse, number of sexual partners, condom/OCP use, reports of STDs/pregnancies, intervening variables of attitude/communication | No differences in frequency of intercourse, no. of sex partners, condom/OCP use, STDs among sexually experienced at pretest. Few significant effects on intervening variables at 3-mo. dissipated at 17 mo. | Not an exact replication of PSI. Both subjects and controls exposed to media campaign intervention. Admitted inconsistencies in quality of leaders. Likely inconsistencies among local implementations. Enormity of intervention stretched resources |

shown in Table 1.) Two similar but independent evaluations of the program were performed by researchers from Arizona State University. In each evaluation, participants were assigned subjectively and nonrandomly by teachers and principals to either treatment or control (14). The increased amount of sexual activity of participants versus controls at pretest may be owing to selection bias. The program was first evaluated (Table 1) in middle schools and other community sites. No change was found from pretest to posttest in adolescents' attitudes toward appropriate age of first intercourse or of marriage, or in family communication. An unexpected and undesired increase was found in the precoital sexual activity of participants, especially boys, even when those with previous sexual experience were excluded. Inconsistencies in reporting of precoital activity raises doubt about the validity of this finding (15). The posttest was administered at the last treatment session, 6 weeks after the pretest, not allowing a lengthy period during which to measure behavioral changes (14).

The program was replicated in 20 different sites that included public and parochial schools, community centers, and an Indian reservation. A total of 528 early adolescents, predominantly female (57%), in Grades 6–8 were included. The majority of these were Hispanics (64%), with 15% African-Americans, 12% Whites and 5% Native Americans. There were no significant differences between the control and experimental groups in beliefs about premarital sexual intercourse, in sexual behavior, in self-esteem, or in family communication. Those in the intervention group were not more likely to make a desired change toward a favorable view of abstinence. These findings were also true when analyses were limited to participants who reported being virgins at pretest. However, among virgin boys in the intervention group, there was again a trend toward more precoital sexual activity. Dropouts from the replicants (34% of the intervention group, 24% of controls) were found to report a higher level of lifetime sexual activity and more permissive attitudes toward premarital sexual behavior than participants (6).

Project Taking Charge, also sponsored by OAPP, is a curriculum designed for communities with high rates of adolescent pregnancy and low family income. Components described in Table 1 are supplemented by three evening sessions for parents with their adolescents. An evaluation was completed by researchers from Texas Tech University in low-income, high-unemployment areas in Wilmington, Delaware, and in West Point, Mississippi. The 91 participants were randomly assigned to treatment or control arms. Immediate posttesting and 6-month follow-up testing were completed with zero attrition. Although there were significant gains on knowledge scales in the treatment versus control population that were maintained through the 6-month follow-up, no significant effect was found in the areas of self-esteem, sexual values, or parental communication, as defined by scales developed for this evaluation. Among those without previous sexual experience, the two groups differed significantly in the rate of sexual initiation during the 6-month period. Fifty percent of controls as compared with 23% of the treatment group initiated intercourse during the short time period. The small sample size decreases the power and generalizability of this evaluation (8).

Three programs, Sex Respect, Values and Choices, and the Teen-Aid Family Life Education Project, were evaluated in the state of Utah by the State Office of Education and reported conjointly. A single scale score measuring attitudes toward premarital sexual intercourse among teens was used as the outcome variable. The scale was derived from 13 items from the Youth Survey, developed by the Institute for Research and Evaluation in Salt Lake City. Neither the power nor significance of measured attitudinal changes was included in this report. The only behavioral measures were two questions asking about sexual experience during the respondent's lifetime and within the past 4 weeks. Behavioral change was not reported separately for each program, but was reported overall to correlate significantly with the attitudinal changes. The rate of attrition for each program from pretest to posttest was also not reported. Furthermore, the evaluation did not include a control group, long-term follow-up or a representational sample. Each of the programs was evaluated in different school districts in suburban or rural settings, so results from each program are not readily comparable even to each other (16).

Sex Respect, developed by the Utah State Office of Education through funding by OAPP and private corporations, promotes abstinence through teaching respect for self and for others. Its curriculum contrasts human reproduction with animal reproduction to show the importance of interpersonal relationships, but does not provide detailed information about physical growth and development, sexual anatomy and physiology, childbirth, sexual response, contraception, sexual orientation, or abortion (Table 1). Many of the concepts are communicated by means of cartoons that increase the curriculum's usefulness in areas where lack of literacy is a prob-

lem (17). They did not report how extensively the resource materials (listed in Table 1) were used. In the Utah report, pre- and posttests showed the desired change in attitudes toward adolescent sexual activity, with greater change among senior high than among junior high students. The quantification of the magnitude of this desired change was not clearly stated, but can be estimated as a change of 0.25 points on a 5.0-point scale. This was noted to be greater than the magnitude of change found with the other two curriculae in this evaluation, although, as stated above valid direct comparisons between programs cannot be made.

The Teen-Aid Family Life Education Project (developed by Teen-Aid, Inc., of Spokane, Washington, with funding from the OAPP) actually includes two separate curriculae: "Me, My World and My Future" for junior high students and "Sexuality, Commitment, and Family" for senior high. The program promotes abstinence from a health standpoint (18) (Table 1). These two curriculae contain detailed information on human reproduction, fetal development, abortion methods, and the consequences of sexual activity (19,20). A modest desirable attitudinal change in regards to sexual intercourse among unmarried adolescents was found in both high school boys and girls, but not in junior high students (16).

Values and Choices, a program grounded in the Theory of Reasoned Action (21), was developed by the Search Institute in Minnesota (also with OAPP funding) (16). The curriculum presents abstinence in the context of seven essential values (Table 1) (22). In the Utah evaluation, performed under similar noncontrolled circumstances as in the Teen-Aid and Sex Respect curriculae, there were small attitudinal changes in the desired direction among high school and middle school students (16).

Another evaluation of Values and Choices was conducted in seventh- and eighth-grade classes in five sites: Minneapolis and Grand Rapids, Minnesota; Detroit, Michigan; Denver, Colorado; and the San Francisco Bay area of California. The sample size and statistical power of this evaluation were not reported. A high attrition rate of 60% diminished the weight of the findings. The evaluation showed a significant positive pretest to posttest difference between the experimental and control groups in students' knowledge of sexuality, attitudes toward sexual activity, intention to have sex before marriage, and parental communication. These changes did not maintain significance at the delayed posttest held 3–4 months afterward. Furthermore, the evaluation did not show that the course generated a more negative or "repressed" view of sex among participants (23).

Facts and Feelings, another program sponsored by the OAPP, is a home-based rather than a school-based intervention that offers a set of 15–20-min videotapes with brief accompanying printed material designed to be used to initiate family discussions. Targeted at 10- to 14-year-olds and their parents, the program is composed of six units (24). "Changes" deals with the social, emotional and physical changes at puberty. "Values" discusses the validity of abstinence. Although it leaves specific family values open for discussion, it does identify four core values (respect for self, respect for others, self-control, and gender equality) as being essential. "Facts" reviews sexual anatomy, reproduction, prenatal development, and the process of birth. "Meanings" discusses the meaning of sexuality in the context of relationships, as well as the advantages of postponing sex. It also points out how media messages often conflict with the family's values. "Choices" points out the consequences of sexual intercourse for teenagers and includes decision-making skills. "Skills" stresses the value of assertiveness in implementing the sexual decisions made by teens (24).

An evaluation of Fact and Feelings was conducted in northern Utah by researchers from Utah State University. All families (approximately 6000) in two urban and two semirural school districts were invited to participate in the intervention; 548 families volunteered. Families were randomized to receive video, video plus the printed material, or neither. The videos were distributed to the families at home by a project leader who administered a baseline questionnaire at the first visit. Separate questionnaires were completed anonymously and confidentially by parents and youths. The project leaders returned to the homes 3 months later to collect the videotapes and administer a follow-up questionnaire. Twelve months after the tapes were distributed, a delayed posttest questionnaire was administered. Ninety-two percent of families who participated in the pretest also completed the delayed posttest, with attrition rates among the three study groups ranging from 5% to 10%. Parent–child communication on topics related to sexuality increased at the 3-month posttest in the treatment group compared to the controls ($p = .000$), but returned to pretest levels at the 12-month follow-up. The homogeneity of the sample (95% of participating adolescents remained virgins at the delayed posttest) made it difficult to demonstrate behavioral change or even attitudinal changes brought on by the interven-

tion. Thus, there was no significant difference between control and the two treatment groups in sexual behavior ($p = .662$), in the perceived likelihood to become sexually active in the next year ($p = .889$) or before marriage ($p = .98$), or in teen's values in relationship to abstinence ($p = .087$). The homogeneity and largely Mormon makeup of the sample also preclude extrapolation to other populations (24).

### Abstinence-Plus Programs

Reducing the Risk is grounded in the behavioral theories of social learning (25), social inoculation (26), and cognitive behavior (25), and was produced with funding from the National Institute of Health Division of Research Resources along with two private foundations. Its emphasis on abstinence is less strong than other programs reviewed. Instead, it establishes explicit norms against unprotected sexual intercourse by way of contraceptive use, as well as abstinence (7). Further details of the curriculum are found in Table 1.

Reducing the Risk was evaluated in 13 California high schools in 46 classrooms. The experimental curriculum was implemented in 23 of these classes. Approximately one half of the classes were taught by the same set of teachers, whose classes were randomly assigned to receive either the Reducing the Risk curriculum or the existing sex education material in the 10th-grade health education course. These teachers were specifically instructed not to use any of the techniques or material from Reducing the Risk in teaching their classes assigned to receive the regular sex education course. The remaining classes were not randomly assigned. Teachers who had volunteered to be trained in implementing Reducing the Risk taught only the experimental curriculum, while the teachers who did not volunteer to receive this training taught the regular curriculum. This lack of complete randomization had the potential to bias the results of this study. A total of 758 students completed both pretest and immediate follow-up surveys (an attrition rate of 27%). Those lost to follow-up were found to be at higher risk in the pretest (7).

Students were administered a survey before the program began ($n = 1033$), after the intervention was conducted, and 6 months ($n = 722$) and 18 months later ($n = 758$). There was a significant difference ($p < .001$) in increased knowledge related to curriculum material between the two groups. Among students sexually experienced at the pretest, frequency of sexual intercourse and of contraceptive use did not differ significantly between the two groups at either posttest. Students without previous sex experience in the treatment group were less likely than those within the control group to have initiated intercourse at the 18-month follow-up (29% vs. 38%; $p < .05$), and those who did initiate intercourse after the pretest were less likely to have had unprotected sex at last intercourse (9% vs. 16%; $p < .05$). Students who were at lower risk in the areas of school performance, family structure, maternal education level, and alcohol use were more likely to use contraception at extended follow-up (3% vs. 11%; $p < .001$), as were female students who had not initiated intercourse before pretest (4% vs. 16%; $p < .001$). A significant increase was found in the treatment group versus the control group in those who reported talking with their parents concerning abstinence (13% increase vs. 1%; $p < .01$) and birth control (15% increase vs. 2%; $p < .01$) but not about pregnancy or sexually transmitted diseases. Furthermore, there was no significant difference found between the two groups during an 18-month follow-up in students reporting pregnancy involvement (each group increased 6%) or in reported intention to avoid unprotected intercourse (decreased 1–2%) (7).

Postponing Sexual Involvement was developed at Grady Memorial Hospital in Atlanta, Georgia, with assistance from private funding. With basis in the theory of social inoculation, the program was designed to follow five classes on human sexuality already being taught in local classrooms by hospital personnel. These preexistent classes, which included information about family planning, had failed to show a significant effect on sexual activity or birth control use in an earlier evaluation. The new intervention sessions were designed to be led under adult supervision by 11th- and 12th-grade role models trained to present information, lead discussions, and teach skills in assertiveness, decision making, and resisting sexual pressure. The first four sessions were given within a span of 1–4 weeks, with the last session given as reinforcement 1–3 months later (27).

Postponing Sexual Involvement (PSI) was evaluated by researchers from Emory University with a cohort of students born at Grady Hospital in 1972, entering eighth grade in 1985. Less than 1% of parents refused to allow their children to participate in this program. A total of 666 students completed baseline and immediate posttest interviews. The data from 18 cases were discarded because of inconsistent reporting of initiation of intercourse. The differences between dropouts and those who completed all six waves were not reported. The treatment group of 395 consisted of cohort members enrolled in schools in

the Atlanta City School system. Although random assignment was not used, little difference was found between the two groups in sociodemographic factors or in previous sexual experience that might bias the results toward the treatment group. Ninety-nine percent of participants were black and roughly half were classified as low income. Students in the experimental and control schools received the five classes on human sexuality, but only those in the experimental group were also exposed to the PSI curriculum. Six waves of telephone interviews were conducted during the course of the study (beginning, middle, and end of 8th grade; beginning and end of 9th grade; and end of 12th grade) by an independent survey research group as part of a wide-ranging health survey. Thus, participants were not made aware that the survey was an evaluation of the PSI program, so that they would not intentionally bias their answers. They were given verbal codes to answer sensitive questions so that confidential information would not be disclosed to others in the household (12).

The students who were sexually inexperienced at the initiation of the program in the treatment group were less likely than their counterparts in the control group to have initiated sexual intercourse at each follow-up (the end of the 8th grade through the end of the 12th grade) with significant differences found at the end of the 8th grade (20 vs. 4%; $p < .01$) and at end of the 9th grade (39 vs. 24%; $p < .01$). By the time of the completion of the study, there was still an 8% difference (nonsignificant) in the rate of initiation of sexual activity between treatment and control groups. Among those who initiated intercourse after the program began, those in the treatment group were more likely to report having intercourse less frequently (55 vs. 39% reporting having sex "often" or "many times"), to report discontinuation of sexual activity, and also to report frequent use of contraception ("because of what I learned in school") (27). Medical records at Grady Hospital were use to validate the reported 33% fewer pregnancies among the treatment group girls than among the control group at the end of ninth grade. At the 12th-grade follow-up, this trend appeared to have continued, with proportionately one third fewer pregnancies among the treatment group girls than control. Among boys, there was a slightly higher report of pregnancy involvement among control group members than those in the treatment group (11% vs. 8%). Although PSI appeared to be effective for those students who had not begun having intercourse before the program began, it did not have an effect upon the sexual involvement or contraceptive use of participants who were already sexually active at the program's beginning (12,27).

Project Education Now and Babies Later (ENABL) was a replication of PSI sponsored by the California Department of Human Services in 31 counties. The implementation of local programs using the PSI curriculum was contracted out to 28 local nonprofit organizations and social service agencies. Other components of Project ENABL included a media and public relations campaign, statewide training for local staff and PSI leaders, and a statewide evaluation of individual programs' implementation and effects. Although some of the classes were taught by teen leaders under adult supervision, as called for in the intervention design, 90% of PSI classes were taught by adult leaders, professional educators, and college students. A total of approximately 187,000 students of the 203,000 originally enrolled completed at least four of the five sessions. The program was implemented in seventh- (52%) and eighth- (39%) grade classrooms as well as in community organizations. Entire schools were randomized to receive either the intervention or their regular instruction, which often did not include a sexuality education curriculum (28).

The results of this replication were disappointing. There was no difference between intervention and comparison groups in initiation of sexual activity in students who were virgins at pretest at 3-month or 17-month follow-up for any gender, grade, or race. There were no significant differences found for changes in frequency of intercourse or number of sexual partners in those sexually experienced at pretest. Neither was there any significant impact made upon frequency of condom use, oral contraceptive use, or reports of sexually transmitted diseases. Only in students in teen-led classrooms was there found at the 17-month follow-up a significant difference in the proportionate number of pregnancies among those never pregnant at pretest. Also disappointing was the lack of impact upon most intervening variables. The small positive effect upon a few variables shown at the 3-month follow-up had disappeared by the 17-month follow-up (28).

There were some design limitation and implementation differences that separated this from the earlier evaluation. The evaluation compared PSI to no intervention in some locations, but in others to an existing sex education curriculum. Control subjects as well as intervention students were subject to the concurrent media campaign. In the earlier study, the five PSI session were held in conjunction with and immedi-

**Table 2.** Promising Elements of Reviewed Programs

| | Success Express | Project Taking Charge | Sex Respect | Teen-Aid | Values and Choices | Facts and Feelings | Postponing Sexual Involvement | Reducing the Risk |
|---|---|---|---|---|---|---|---|---|
| Abstinence-only | X | X | X | X | X | X | | |
| Abstinence plus contraceptive use training | | | | | | | X | X |
| Theoretical approach | | | | | X | | X | X |
| Reinforcement of values | X | X | X | | X | X | X | |
| Parental involvement | | X | X | X | X | X | | |
| Emphasis on family communication | | X | | X | X | X | | X |
| Addressing social/media influence | X | | | | | X | X | X |
| Training in refusal skills | X | | X | | | X | X | X |
| Role play | | | | | | | | X |
| Role models | | | | | | | X | |
| Creative media resources | | | X | | X | X | | |

ately following five sessions of sex education by the same developers. Project ENABL did not provide these preliminary sessions, nor was it implemented according to the recommended schedule. In the California replication, the curriculum was usually not implemented by teen leaders as specifically prescribed in the curriculum, and when it was, the quality of the teen leaders' presentations was reportedly inconsistent. Not all of the teen leaders had enough training, experience, or skills, to comfortably implement the curriculum and talk about issues of sexuality to younger teens. There were also inconsistencies observed in the quality of the presentations made by the adult leaders, perhaps owing to a lack of enthusiasm for the curriculum on the part of certain leaders not happy about exclusion of a stronger emphasis on contraception. Paradoxically, others voiced criticism that the curriculum did not have a clear "wait until marriage" message. The sheer volume of students that were supposed to receive the curriculum forced some of the local contractors to stretch time and resources to complete the curriculum assignments (28).

## *Successful Programs and Promising Program Components*

The programs that showed a measurable desired behavioral change included PSI, Reducing the Risk, and Project Taking Charge. Programs that showed a desired attitudinal change, but were not evaluated in terms of behavior, included Sex Respect, and the curriculae of Teen-Aid, Inc. Values and Choices as well as Facts and Feelings showed desired attitudinal changes that were not sustained.

Program elements found in this review to hold promise of program success are listed in Table 2. A strong emphasis on abstinence is a common component of all programs reviewed except Reducing the Risk, which placed more emphasis on avoiding unprotected intercourse. A firm grounding in contemporary theories of health behavior is an important key to the success of a program. The reinforcement of clear and appropriate values to make abstinence the subjective social norm among adolescent peer groups is another positive factor. One effective strategy is to include parents in the program to increase their sense of involvement and their level of communication with their adolescents. Another promising element has been addressing social and media influences upon adolescent sexual behavior and how these influences differ from family values and healthy practices. Training in polite but firm ways to refuse the pressure to engage in sexual behavior reinforces the abstinence message in some programs. In many programs, role playing provides an opportunity to practice these refusal skills, as well as skills

in negotiation and communication. This may allow teenagers to think through precarious situations before they are actually faced with them. The use of slightly older role models to lead intervention sessions is a promising approach used by PSI. Creative media resources such as videotapes, cartoons, shirts, posters, and public service announcements are used in some programs as an innovative and favorable means of reinforcing and personalizing the abstinence message.

### *Current Efforts to Promote Abstinence*

Several programs are currently being implemented that promote teenage abstinence outside the realm of public health education institutions. These programs range from those within religious groups to efforts by popular media and sports celebrities. Although none of these have undergone rigorous evaluation, some may become valuable parts of the efforts against the problems associated with adolescent sexual behavior.

Campaign for Our Children was incorporated in November 1987 as a not-for-profit organization with the goal of reducing teenage pregnancies in Maryland. Begun through the collaborative efforts of several branches of the state government, it has used input and financial contributions from both public and private sectors to create a comprehensive agenda. Average annual program expenditures, including both public funds and private donations of money and services, are between $2 and $3 million. Children, adolescents, parents, and community leaders are targeted with messages strongly advocating abstinence through mass media advertising, press releases, active in-school programs, and public health facilities. Hard-hitting television and radio spots, billboards, posters, and brochures are all used to emphasize the message. Some of the these include "You Play, You Pay"—an advertisement describing the consequences of sexual involvement to young men and women; "Abstinence Makes the Heart Grow Fonder," which targets adolescents with the abstinence message; and billboards proclaiming "Virgin is not a dirty word." In-school materials focus on goal-setting, decision-making, refusal skills, self-esteem, and relationship building. A recently completed evaluation of the program by Johns Hopkins University Center for Communication Programs concluded that the more exposure adolescents had to the campaign, the more they talked to a parent or other adult about the campaign and sexuality. In a process evaluation of the program, 75% of students reported that the CFOC program materials helped them to talk with their parents about sexuality, family life, dating, and other related issues. Although this campaign was certainly not the only intervention to which Maryland students might have had exposure (the number of school-based health clinics was expanded during this time as well), the program is felt to have contributed to the 17% decrease in adolescent birth rates in the state since 1990. At least 13 other states and four other countries are using the campaign's television and radio spots, billboards, posters, and other elements in their battle against teen pregnancy (29).

One of the most widely publicized abstinence programs, True Love Waits, was begun by an agency of the Southern Baptist Convention in April 1993 to organize support for youth who were being ostracized at their schools for not engaging in sexual intercourse (30). It progressed from an effort within local churches to a nationwide and eventually international campaign that has been embraced across sectarian lines. Program materials include plans for programs within churches and schools, discussion guides, media clips, music videos, posters, jewelry, and apparel. Participants are encouraged without coercion to voluntarily sign a commitment card to remain sexually abstinent until marriage. Over 230,000 such cards were displayed in Washington, DC, during the first year 1994; more than 220,000 international pledge cards were exhibited in Buenos Aires in 1995; and over 340,000 cards were stacked "through the roof" of the Atlanta Georgia Dome in 1996 (30,31). Formal behavioral evaluations of this campaign have not been performed owing to difficulty in performing such evaluations. However, taking a pledge of virginity was the highest indicator that a teen would not engage in early sexual behavior, according to the National Longitudinal Study of Adolescent Health (32).

Another yet unevaluated campaign is Athletes for Abstinence, a celebrity-based program led by A. C. Green, a professional basketball player. This program's message emphasizing abstinence in the context of career choices, values, and life skills is spread through motivational speeches, videos, and role modeling by athletes at youth rallies. A 6-week curriculum for students 12–18 years old, entitled "I Got the Power," emphasizing the empowering aspects of abstinence, has been developed for use within schools and organizations (33).

## Discussion

A sizable minority of adolescents are abstinent. According to the 1995 report of the Youth Risk Behavior Surveillance System, 46.9% of students in Grades 9–12 have never experienced intercourse (34). This percentage remained stable during the early 1990s (45.8% in the 1990 report and 47.0% in the 1993 report) (35). Among those with previous sexual experience, 28.5% had not experienced intercourse within the preceding 3 months. An even larger proportion of young teenagers was reported never to have experienced intercourse (84% of 13-year-olds, 77% of 14-year-olds, and 70% of 15-year-olds). Girls were more likely than boys never to have experienced intercourse, and Whites were more likely than Blacks or Hispanics (36). This review suggests that the percentage of adolescents primarily or secondarily abstinent may be increased at least short term by well-designed programs adeptly implemented in a community of receptive teenagers. Parental involvement, solid theoretical grounding, reinforcement of appropriate social norms, and teaching the interpersonal skills necessary to remain abstinent appear to hold promise for program success. It should be emphasized that in most cases, these programs are designed to complement existing instructional material on reproductive health and not to take its place.

Up to the present time, no evaluated program with an exclusive abstinence message has been evaluated in such a way as to show a significantly positive impact on behavior; some have shown a desirable effect on attitude. On the other hand, no study has clearly shown the abstinence message to be detrimental or even impractical. In fact, the one study that sought a negative effect upon adolescents' views of sexuality did not find one (23). The lack of measurable success of abstinence-only programs may reflect a lack of rigorous evaluation of some programs on behavioral scales, problems in implementation in other situations, and the lack of long-term follow-up. In other studies where behavioral changes were observed, it often took 18 months of follow-up for these changes to reach significance (7). Some programs were evaluated in populations where abstinence is already the norm among adolescents, thus making a measurable impact difficult. At least one program that sends a strong abstinence message, even while coupled with a human sexuality course that includes information on contraception, has been evaluated to have a significant effect on the sexual behaviors of targeted teenagers (12).

The words of one of these programs' publisher, The Search Institute, may well be truthful: "One fifteen session values-based program cannot do it alone. For sexual restraint to become a long-term reality for young adolescents, we need families, churches, and youth organizations that continually reinforce the same message. The community that effectively prevents teenage pregnancy is one that consistently and persistently promotes shared values, advocates restraint, and empowers parents and other adults to communicate with youth" (22).

## Conclusions

Teen pregnancy and sexually transmitted diseases including HIV carry tragic consequences for adolescents. The message that abstinence is the only absolute protection against these dangers is gaining acceptance and has shown some positive effect upon adolescents' attitudes and sexual behavior. Evaluations of abstinence-only programs using behavioral indicators and long-term follow-up are needed to truly assess their impact.

Program designers should be encouraged to explore new approaches while building upon the promising components of programs that have been moderately successful. Health educators and providers examining curricula to implement need to be aware of the strength of evaluations, or the lack of thorough evaluations, of the programs that they are considering. Meanwhile the federal and state governments should be encouraged to increase use of the existing programs that have been shown to have a positive effect. Instead of a one-shot approach, the use of multiple developmentally appropriate programs at different age levels is needed to reinforce prevention efforts. Collaborative efforts across disciplines should be advocated to promote postponement of sexual activity among adolescents, and to thus decrease the risk of adolescent pregnancy and the spread of HIV and other sexually transmitted diseases among teenagers.

## References

1. National Research Counsel. Risking the Future: Adolescent Sexuality, Pregnancy, and Childbearing, Washington, DC: National Academy Press, 1987.
2. Eng TR, Butler WT, eds. The Hidden Epidemic: Confronting Sexually Transmitted Diseases. Washington, DC: National Academy Press, 1997.
3. Section 510, Title V of the Social Security Act, 42 United States Code 710.

4. *Healthy Youth 2000: National Health Promotion and Disease Prevention Objectives for Adolescents.* Chicago: American Medical Association, 1990.
5. Department of Health and Human Services Press Office. The Personal Responsibility and Work Opportunity Reconciliation Act of 1996. http://www.acf.dhhs.gov/programs/CSE/new/teenpreg.html (January 14, 1997).
6. Roosa MW, Christopher FS. Evaluation of an abstinence-only adolescent pregnancy prevention program: A replication. Fam Relat 1990:39:363–7.
7. Kirby D, Barth RP, Leland N, Fetro JV. Reducing the risk: Impact of a new curriculum on sexual risk-taking. Fam Plann Perspect 1991;23:263.
8. Jorgensen SR, Potts V, Camp B. Project Taking Charge: Six month follow-up of a pregnancy prevention program for early adolescents. Fam Relat 1993;42:401–6.
9. Mecklenburg ME, Thompson PG. The Adolescent Family Life Program as a preventative measure. Public Health Rep 1983,98:21–7.
10. Orr D, Beiter M, Ingersoll G. Premature sexual activity as an indicator of psychosocial risk. Pediatrics 1991;87:141–7.
11. Billy J, Landale N, Grady W, Zimmerle D. Effects of sexual activity on adolescent social and psychological development. Soc Psychol Q 1988;51:190–212.
12. Howard M, McCabe JB. Helping teenagers postpone sexual involvement. Fam Plann Perspect 1990;22:21–6.
13. Roper Starch Worldwide. Teens Talk About Sex: Adolescent Sexuality in the '90's. New York: Sexuality Information and Education Council of the United States, 1994.
14. Christopher FS, Roosa MW. An evaluation of an adolescent pregnancy prevention program: Is "just say no" enough? Fam Relat 1990;39:68–72.
15. Thiel KS, McBride D. Comments on an evaluation of an abstinence-only adolescent pregnancy prevention program. Fam Relat 1992;41:465–7.
16. Olsen JA, Weed SE, Ritz GM, Jensen LC. The effects of three abstinence sex education programs on student attitudes toward sexual activity. Adolescence 1991;26:631–41.
17. Goodson P, Edmundson E. The problematic promotion of abstinence: An overview of sex respect. J Sch Health 1994;64:205–10.
18. Teen-Aid, Inc. Teen-Aid at a Glance. http://www.teen-aid.org (April 21, 1997).
19. Potter S, Roach N. Sexuality, Commitment and Family. Spokane, WA: Teen-Aid, Inc, 1990.
20. Roach N, Benn L. Me, My World, My Future. Spokane, WA: Teen-Aid, Inc., 1987.
21. Ajzen I, Fishbein M. Understanding Attitudes and Predicting Social Behavior. Englewood Cliffs, NJ: Prentice-Hall, 1980.
22. Williams D, ed. Human Sexuality: Values and Choices, rev ed. Minneapolis, MN: Search Institute, 1991.
23. Moore KA, Sugland BW, Blumenthal CS, et al. Adolescent Pregnancy Prevention Programs: Interventions and Evaluations. Washington, DC: Child Trends, Inc., 1995.
24. Miller BC, Norton MC, Jenson GO, et al. Impact evaluation of Facts & Feelings: A home-based video sex education curriculum. Fam Relat 1993;42:392–400.
25. Bandura A. Social Learning Theory. Englewood Cliffs, NJ: Prentice-Hall, 1977.
26. McGuire W, Introducing resistance to persuasion. In: Berkowitz L, ed. Advances in Experimental Social Psychology, vol 1. New York: Academic Press, 1964:191–229.
27. Howard M. Delaying the start of intercourse among adolescents. In: Coupey SM, Klerman LV, eds. Adolescent Medicine: State of the Art Reviews. Philadelphia: Hanley and Belfus, 1992:181–93.
28. Kirby D, Korpi M, Barth R, Cagampang H. Evaluation of Education Now and Babies Later (ENABL): Final Report. Berkeley, CA: University of California, School of Social Welfare, Family Welfare Research Group, 1995.
29. Campaign for Our Children. CFOC at a Glance. Campaign for Our Children Origins, Sending a Clear Message to Teens, Evaluation of Camaign for Our Children. http://www.cfoc.org (August 27, 1997).
30. New York Times. True Love Waits for Some Teenagers. June 21, 1993:A12.
31. The Baptist Sunday School Board. The Facts About True Love Waits. http://www.bssb.com (February 24, 1998).
32. Resnick MD, Bearman PS, Blum RW, et al. Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. JAMA 1997;278:823–32.
33. A. C. Green Programs for Youth. Abstinence Curriculum. http://www.acgreen.com (February 25, 1998).
34. Kann L, Warren CW, Harris WA, et al. Youth Risk Behavior Surveillance—United States, 1995. MMWR CDC Surveill Summ 1996;45:1–84.
35. Center for Disease Control. Trends in sexual risk behavior among high school students—United States, 1990, 1991, and 1993. MMWR 1995;44:124–5,131–2.
36. *Sex and America's Teenagers.* New York: Alan Guttmacher Institute, 1994.