School-Based Teen Pregnancy Prevention Programs: A Review of the Literature

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ABSTRACT: Teenage pregnancy is a well-documented problem in the United States, with approximately 890,000 teenage pregnancies occurring each year. Although teen pregnancy rates have declined since 1991, rates remain higher than the mid-1970s and are fourfold those of European countries. Substantial morbidity and social problems result from these pregnancies, affecting the mother, her children, other family members, and society. Multiple educational approaches have been used, with few demonstrating significant reductions in teen pregnancy. School-based programs have been diverse and multifaceted. Recently, programs with a comprehensive approach have shown potential for success. In this article, characteristics and elements of promising school-based programs are identified and discussed. It is imperative that school nurses play an active role in developing and implementing prevention programs that incorporate rigorous evaluation. As health educators, school nurses are in a prime position to implement and evaluate the effectiveness of teen pregnancy prevention programs.

KEY WORDS: adolescents, Baby Think It Over, Postponing Sexual Involvement, pregnancy prevention programs, Project Taking Charge, Reducing the Risk, Safer Choices, sex education, Teen Outreach

INTRODUCTION

Teenage pregnancy is a well-documented problem in the United States. Although teen birth rates remain high, they have fallen gradually since 1991 (March of Dimes, 2000; National Campaign to Prevent Teen Pregnancy, 2000). Despite this decline, recent statistics indicate that teen birth rates remain higher than they were during the early to mid-1970s and continue to exceed the rates in most developed countries (Kann et al., 1998; March of Dimes, 2000). The teen birth rate in the United States is fourfold that of European countries (Card, 1999). Approximately 890,000 pregnancies occur each year among U.S. adolescents (National Campaign to Prevent Teen Pregnancy). These pregnancy rates include live births, induced abortions, and fetal losses. The high rates of teenage pregnancy and childbearing occur among almost all races and ethnic groups in the United States. Socioeconomic conditions and the family appear to influence early teenage sexual activity more than race (Clifford & Brykczynski, 1999).

Substantial morbidity and social problems result from adolescent pregnancies (Kann et al., 1998; Nitz, 1999). Adolescents who give birth are more likely to have lower educational and occupational attainment, remain single parents, and suffer poverty (Maynard, 1996). The children of teenage mothers experience more cognitive and behavioral problems by the time they reach school age, and they have less stimulating home environments, poorer educational outcomes, and higher teen pregnancy rates when they become adolescents than children of adult mothers. Society as a whole experiences high costs associated with public assistance and health care for adolescent parents and their children (Maynard).

Teen pregnancy prevention is currently a public health priority. Many efforts to decrease teen pregnancies have failed over the past 40 years. Current interventions include pregnancy prevention education, access to contraceptive services, and community-based

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life option programs. Each effort uses a variety of approaches, including clinical and school-based services (Nitz, 1999). Although there have been multiple approaches designed to prevent adolescent pregnancy, few programs have demonstrated significant pregnancy reductions, in part because outcomes have not adequately been evaluated (Nitz). As prevention efforts multiply, there is need for research that examines not just program outcomes but also the processes by which programs create change in participants. The recent decline in teen pregnancy, birth, and abortion rates has been attributed to many factors. Abstinence and voluntary contraception are both on the rise. Use of condoms among sexually active teens has risen fourfold in the last 15 years, from 11% to 44%, mostly due to HIV and AIDS. In addition, a strong economy allowed teens to perceive more life options and delay childbearing to prepare for a career (Card, 1999).

REVIEW OF THE LITERATURE

For almost a century, schools have been developing programs to reduce sexual behavior in youth at risk for pregnancy or sexually transmitted diseases (STDs). The following section reviews the common approaches to and characteristics found in pregnancy prevention programs.

Pregnancy prevention education is a common strategy. These programs are often labeled *family life education*. Most of them provide information about sexuality, reproduction, decision making, and sexual relationship issues. They focus on teaching about the reproductive process and how to avoid an STD or pregnancy, using either abstinence or contraceptives (Nitz, 1999). Curricula have been diverse and implemented primarily in junior and senior high schools. Historically, most of the programs contain activities or elements reflecting a variety of approaches. These approaches can be divided into five groups (Kirby, 1992, 1999a):

1. Programs that increase knowledge and emphasize the risks and consequences of pregnancy.
2. Programs that clarify values and provide skills, especially decision-making and communication skills.
3. Abstinence-only curricula.
4. HIV/AIDS education.
5. Theoretically based programs building on the successes and failures of previous programs, with more rigorous evaluation.

In the early 1990s, several new approaches and modifications of earlier methods appeared. These included (a) a renewed emphasis on abstinence, (b) a more positive view of responsible sex, and (c) a greater emphasis on character development. Many collaborative programs among schools, community groups, and family planning clinics have been implemented to coordinate educational efforts and youth development programs for the prevention of initial and repeat teen pregnancies (Card, 1999). In addition, initiatives in the form of sex education, statutory rape laws, and media campaigns with a variety of messages promoting teen pregnancy prevention have come from both local and state governments. At the national level, the National Campaign to Prevent Teen Pregnancy was founded in 1996 to prevent teen pregnancy by supporting values and stimulating actions that are consistent with a pregnancy-free adolescence. The campaign goal is to decrease teen pregnancy rates by one third by the year 2005 (National Campaign to Prevent Teen Pregnancy, 2000).

The acceptance of scientifically evaluating teen pregnancy prevention programs has been slow. By 1990, several hundred teen pregnancy prevention programs had been developed and implemented; however, even today only a few have been adequately evaluated. A consensus is growing that program development should include rigorous outcome evaluation (Card, 1999).

Based on the evaluation that has been done, current programs that demonstrate the most improvements in teen pregnancy rates share the following nine characteristics (Card, 1999; Kirby, 1999b):

1. They focus on reducing sexual behaviors that lead to unintended pregnancy or STD.
2. They include behavioral goals, teaching methods, and materials that are age and culturally appropriate, so that the problem is always seen through the eyes of the students whom the programs seek to serve.
3. They are based on theoretical approaches, such as social learning theories, which have been demonstrated to be effective in influencing health-related risky behaviors.
4. They are of appropriate length to allow participants to complete important activities. For example, a program does not merely consist of an assembly, but includes multiple components with sufficient time for follow-up.
5. They provide accurate and basic information about the risks of unprotected sex and methods of avoiding unprotected sex.
6. They use teaching methods that are designed to actively involve the participants so as to personalize the information.
7. They include activities that address social pressures related to sex.
8. They provide models of and practice in communication, negotiation, and refusal skills.
9. They provide training and practice sessions to teacher or peer program leaders who are selected because they believe in the program.

In programs judged exemplary by the Program Archive on Sexuality, Health and Adolescence, a panel

of noted scientists in the field of pregnancy/STD/HIV/AIDS prevention found eight prevalent elements (see Table 1; Card, 1999). Techniques that were involved with successful program delivery are identified in Table 2 (Card, 1999). The elements and techniques of the exemplary programs provide insight into what works and offer a guide to future program development and implementation, especially within the school system.

Table 1. Elements of Exemplary Programs

Abstinence education
Behavioral skill development
Community outreach
Contraceptive access
Contraceptive education
Life option enhancement
Self-efficacy/self-esteem education
Sexuality/STD/HIV/AIDS education

Table 2. Delivery Techniques of Exemplary Programs

Adult involvement
Case management
Group discussion
Lectures
Peer counseling/instruction
Public service announcements
Role playing
Video

PROMISING PRIMARY PREGNANCY PREVENTION PROGRAMS

The following section reviews specific school-based programs reported in professional journals. The programs described appear to have the potential to reduce exposure to unintended pregnancy. Each program varies in components, length, and intensity.

Abstinence-Based Programs

Postponing Sexual Involvement (PSI) is a program designed for students aged 16 years and younger and is aimed at deterring teens from having sexual intercourse. Participants learn about human relationships, sources of sexual pressure, and assertive responses to use in high-risk situations in order to remain abstinent. Trained peer leaders direct repeated role-playing and student interaction over a 10-session period. Video presentations demonstrating refusal and negotiation skills are also used. A field study of PSI was conducted with 1,005 8th-grade students from low-income communities in Atlanta, Georgia. Compared with a control group of peers, male PSI participants who had not had sexual intercourse before the program were found to be 3 times more likely than the comparison group to remain abstinent through the end of the 9th grade. PSI females were 15 times less likely to have engaged in sexual intercourse at the end of the 8th grade than the comparison group. The effects had declined by the end of the 9th grade, but comparison-group girls were still more likely to engage in sexual intercourse than were girls who had participated in the program. Although PSI participants were more likely to delay sexual activity, pregnancy rates were disappointing. No significant differences were found between the comparison group (18%) and the program participants (16%) at either time period (Card, 1999; Howard & McCabe, 1990; Kirby et al., 1994).

Project Taking Charge was developed for junior high school home economics classrooms. It integrates family life education with vocational exploration, interpersonal and family relationships, and decision-making and goal-setting lessons. The program promotes abstinence as the correct choice for teens. No material on contraception is included. A field study was conducted with 136 youths from three low-income communities with high rates of teen pregnancy. Six months following the intervention, program participants showed significant gains in knowledge of sexual development, STDs, and the risks of adolescent pregnancy, relative to a comparison group of peers. There was also some evidence that participation was associated with a delay in the initiation of sexual intercourse. However, the evidence fell short of statistical significance at the .05 level. No long-term follow-up of pregnancy rates was presented (Card, 1999; Jorgensen, 1991; Kelly, 1994).

Abstinence- and Contraceptive-Based Programs

Reducing the Risk is a 16-week program for high school students. The sexuality education curriculum is designed to reduce the frequency of unprotected intercourse through delaying or reducing the frequency of intercourse and increasing contraceptive and STD protection. A field study of the risk reduction program was conducted in 13 California high schools, with 1,033 health education students as participants. Participation in the program significantly increased teens' knowledge and communication with parents about abstinence and contraception. The program also significantly ($p < .05$) reduced the likelihood that students who had not had intercourse at the beginning of the program would become sexually active by the 18-month follow-up assessment. Unfortunately, program participation did not affect the frequency of sexual intercourse or the use of contraceptives among teens who were already sexually active at the start of the program. No long-term follow-up of pregnancy rates was reported (Card, 1999; Kirby, 1992; Kirby et al., 1994).

Safer Choices is a multicomponent, HIV, STD, and pregnancy prevention program for high school youth. This 2-year, school-based intervention is based on so-

cial cognitive theory, social influence theory, and models of school change. The intervention is unique because of its focus on schoolwide change and the influence of the total school environment on student behavior. The program consists of five primary components: (a) school organization, (b) curriculum and staff development, (c) peer resources and school environment, (d) parent education, and (e) school–community linkages. Safer Choices was first implemented during the 1993–1995 school years. The evaluation used a randomized trial involving 10 schools in northern California and 10 schools in southeast Texas with an average of 1,767 students. Five schools from each state were randomly assigned to the Safer Choices program, whereas the other schools were assigned to a comparison program of standard, knowledge-based HIV prevention curriculum. No significant differences, as detected by *t* tests, existed between intervention and comparison schools on any demographic variables used in randomization. Cohort data were collected through trained data collectors using student self-report surveys. Baseline data was collected in the fall of 1993, and the initial follow-up data was performed in spring 1994. The evaluation questionnaire consisted of items assessing demographic characteristics, sexuality-related psychosocial factors, sexual behaviors, and program exposure. The three primary behavioral outcomes included (a) whether students delayed sexual intercourse, (b) the number of times students had intercourse without a condom in the previous three months, and (c) the number of sexual partners with whom students had intercourse without a condom in the previous 3 months.

The survey gathered data on numerous secondary behavioral outcomes, such as use of a condom at first intercourse, use of protection at last intercourse, number of sexual intercourse in the past 3 months, number of sexual partners in the past 3 months, use of alcohol or drugs before intercourse in the past 3 months, being tested for HIV, and being tested for other STDs. The analyses examined the impact of the intervention from baseline to the first follow-up measurement, approximately 7 months later. Significant differences ($p < .05$) were found for 9 of the 13 psychosocial scales including knowledge, self-efficacy for condom use, normative beliefs and attitudes regarding condom use, perceived barriers to condom use, risk perceptions, and parent–child communication. Safer Choices also reduced selected risk behaviors, specifically, reducing the frequency of intercourse without a condom and increasing the use of selected contraceptives at last intercourse. Although results from this study are encouraging, several methodological limitations were evident: (a) self-report questionnaires were used to measure outcomes, (b) students retained in the cohort differed in some aspects from students dropped from the cohort and lost to follow-up, and (c) the data were collected at 7 months, evaluating only the short-term impact of the program. The authors indicate, however, that planned 19-month and 31-month follow-ups will provide an opportunity to examine the long-term impact of Safer Choices (Coyle et al., 1999).

Life Option Enhancement Program

Teen Outreach was designed for teens between the ages of 12 and 17. The program was formulated to prevent early pregnancy and encourage academic progress. The two main program components are small-group discussion sessions with a facilitator and participation in volunteer service learning in the community. An experimental study was conducted with 695 high school students in 25 states who were randomly assigned to either the Teen Outreach program or a control group. Each was assessed at program entry and at program exit 9 months later. Rates of pregnancy, school failure, and academic suspension at exit were substantially lower in the Teen Outreach group ($p < .01$; Allen, Philliber, Herrling, & Kuperminc, 1997).

Another study evaluating this program was conducted with mostly female students between 11 and 21 years of age. The program was implemented around the country, with 985 students participating. Overall, participants had fewer pregnancies and used contraception more regularly than a control group of peers. They also had higher rates of school attendance and greater academic success (Allen, 1994; Allen, Philliber, & Hoggson, 1990; Card, 1999; Philliber & Allen, 1992).

Role-Playing Program

Baby Think It Over is a computerized infant simulator program introduced in 1994. This modular program was designed to be incorporated within and complement other subject curriculum. Ideally, the program reaches teens before they become sexually active and pregnant. Through the use of the Baby Think It Over, a 6½-pound infant simulator, adolescents can experience parenting a newborn. The simulator is designed to replicate the sleeping, waking, and feeding patterns and the random crying episodes of a young infant. The student inserts a ''care key'' into the baby's electronic box and holds it in place for a specific length of time to simulate feeding, bathing, diaper changing, and comforting. The baby can be programmed for easy, normal, or cranky episodes. An electronic device monitors all handling episodes and records any neglect or rough handling. The recommended minimum for a parenting simulation is 2 days for middle school students and 4 to 7 days for high school students. The experience is intended to include student assignment of the baby with its care key, baby care activities, and related worksheet assignments, including pre- and postcare experience questionnaires. The hypothesis is that introducing young

people to the realities of caring for an infant will delay sexual activity and reduce teenage pregnancies (Baby Think It Over, 2000).

A quasi-experimental study of 48 high school students demonstrated the impact of Baby Think It Over on adolescents' attitudes and beliefs regarding future parenting experiences. The Parenting Attitude Scale, a 10-item measure, was used to determine realistic parenting expectations. It was assessed to be adequately reliable among the study's sample with a Chronbach's alpha of .73. Results indicated that after the 3-day intervention, the teenagers who participated had much more realistic notions about the responsibilities and demands involved in childrearing (Strachan & Gorey, 1997).

Another study conducted with 68 6th-grade and 41 8th-grade girls in an urban middle school in a predominantly lower socioeconomic, Hispanic neighborhood had conflicting results. The students cared for the Baby Think It Over doll for 3 days and 2 nights. Responses to a three-part, self-administered questionnaire developed for this investigation and written at a 4th-grade reading level were used to assess the girls' understanding of the responsibilities and difficulties related to parenting. The questionnaire also evaluated the similarity of the Baby Think It Over care and students' view of real infant care and the student's childbearing intentions before and after caring for the baby. Only 29% of the 109 girls participating thought that real infant care would be like Baby Think It Over care. Sixth-grade students were more likely than the 8th-grade students to endorse statements suggesting that real infant care would be easier than Baby Think It Over care. Caring for Baby Think It Over had no significant effect on the intent of students to become teen parents. Of the 109 students, 12% wanted to be teen parents before they cared for the doll, and 15% wanted to be teen parents after they cared for the doll. In discussing these somewhat surprising results, the authors reported that the doll was implemented without the recommended educational program intended by the manufacturer of the Baby Think It Over simulator (Kralewski & Stevens-Simon, 2000).

DISCUSSION

According to the findings of these recent studies, some pregnancy prevention programs appear to delay the onset of sexual activity and increase contraception use by sexually active teens. Although some program evaluations have found changes in attitudes regarding sexual behavior or increased knowledge about reproduction and contraception, few programs have demonstrated a long-term impact on pregnancy prevention.

Common characteristics and components of effective programs have been identified. It appears that programs with a more comprehensive approach have the greatest potential for success (Card, 1999; Nitz, 1999). That should not be surprising because many variables are thought to affect the success of educating teens and decreasing the teen pregnancy rate. Gender, age, previous sexual experience, socioeconomic status, and ethnicity are just a few examples of variables that should be included in studies evaluating program effectiveness.

Several significant limitations are noted in this review of multiple programs. First, most of the programs aimed at reducing teenage pregnancy have not been guided by a theoretical framework. In general, programs are more likely to be successful if they are based on theoretical approaches that have been demonstrated to be effective in influencing other health-risk behaviors (Card, 1999; Nitz, 1999). For example, social influence and learning theories allow a program to go far beyond the cognitive level. They focus on recognizing social influences, changing individual values, changing group norms, and building social skills.

A second limitation is that many of the evaluations have had methodological flaws and constraints. For example, experimental design use has been infrequent, sample sizes are small, and few have used random assignment. As a result, it is difficult to determine whether programs effective for one group will be effective for another. Programs, particularly Baby Think It Over, have reported inconsistent results, indicating the need for more research. Another limitation is that in comprehensive programs with multiple components, it is difficult to differentiate effective from ineffective components or to determine the level of intensity required of the participating students. More complex comparison studies need to be undertaken to answer these questions.

The third limitation among pregnancy prevention programs is that most programs are developed without regard for prior knowledge of sex education or for parental involvement. Several of the program reports identified the need for further evaluation of previous sex education history, grade-level in which students have received this education, and what parental roles have been.

A final limitation among the programs is that not all studies include pregnancy as an outcome measure. This is probably because evaluations only measure the short-term impact of the programs. For example, Project Taking Charge and Reducing the Risk both identify that participation in their programs was associated with a delay in initiation of sexual intercourse but did not provide long-term follow-up measuring pregnancy rates. Programs need to share the results of their evaluations, whether successful or not, to enhance the development of new and innovative interventions.

There are many unanswered questions, beyond the limitations identified, in adolescent pregnancy prevention. Pregnancy prevention efforts need to address issues that go beyond individual decisions about con-

traceptives and fertility. The influence of family, neighborhood, and community must be recognized as having a major impact on reproductive behavior. Few programs have included male participants or family members in their interventions. In addition, future programs should be developmentally and culturally sensitive. They must address the specific needs of adolescent subgroups, younger and older adolescents, as well as those from different ethnic backgrounds. Program evaluation and replication are crucial in the area of teen pregnancy prevention. As program effectiveness is demonstrated, replication studies are needed to examine these promising results with more diverse samples.

IMPLICATIONS FOR SCHOOL NURSING PRACTICE

During the teen years, young people are at constant risk for behaviors that will negatively shape their lives. The school nurse is in a prime position to lead the way in protecting American youth and decreasing the national teen pregnancy problem. Teenage sexuality and pregnancy prevention are indeed complex issues facing school nurses. Although teenage pregnancy rates have declined, the battle is not won. School nurses have the unique ability to make a difference in students' lives and in the choices that they make (Dychkowski, 1999). As health educators, nurses must educate and counsel based on research findings. Furthermore, it is imperative that nurses play an active role in following pregnancy rates to identify trends, reviewing district curriculum and helping to select appropriate programs, and scientifically evaluating outcomes of prevention programs.

Although the effects of the programs identified in this article have been modest, future prevention programs should incorporate the identified components of effective programs. Existing programs can continue to be strengthened by building on what is known to work. The school nurse should base programs on the age, culture, and level of risk of the target population. A logical connection should exist in the program between the components and the length and intensity of each prevention program. Measurable short-term and long-term outcomes that the intervention hopes to achieve should be identified from the beginning. School nurses have much to offer in the link among theory, program design, implementation, and evaluation. Rigorous evaluation of programs is desperately needed.

CONCLUSION

The national focus on lowering teenage pregnancy rates has been somewhat successful, but much remains to be done. The most promising prevention programs appear to be comprehensive in content and varied in delivery techniques. However, uniform scientific evaluation of the effectiveness of these programs is lacking. School nurses have a vital role to play in the fight to reduce teen pregnancy. They have a responsibility to help select or develop appropriate programs, scientifically evaluate program outcomes, and support the implementation of effective programs in their schools and community.

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