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ADOLESCENT PREGNANCY PREVENTION: A REVIEW OF INTERVENTIONS AND PROGRAMS

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ABSTRACT. *Adolescent pregnancy is a significant social concern. Although rates of adolescent pregnancy have decreased in recent years, they are higher than in any other industrialized nation. Adolescent pregnancy increases the risk of negative consequences for mothers and their children. With little theory to guide practice, pregnancy prevention programs have had little success. The most effective programs have extended beyond reproductive health to include life options, such as education and job skills. Future research is needed to understand factors that predispose teens to early childbearing and to develop developmentally and culturally appropriate disincentives to pregnancy. Roles for psychologists are reviewed in program development, evaluation, and implementation.* © *1999 Elsevier Science Ltd*

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ADOLESCENT PREGNANCY AND childbearing are important social concerns with implications for adolescent mothers, their children, and other family members (Furstenberg, 1976; Hofferth, & Hayes 1987; Maynard, 1996). Adolescents who give birth are more likely to have lower educational and occupational attainment, be single parents, and suffer the consequences related to poverty (Card & Wise, 1978; Furstenberg, Brooks-Gunn, & Morgan, 1987; Maynard, 1996; Mott & Marsiglio, 1985). In addition, the children of adolescent mothers have more cognitive and behavioral problems by the time they reach school age, fewer stimulating home environments, worse educational outcomes, and higher teen pregnancy rates when they themselves become adolescents (Brooks-Gunn & Furstenberg, 1986; Ketterlinus, Henderson, & Lamb, 1991). Finally, adolescents who become parents impose a significant impact on society through the high costs associated with public assistance and health care (Maynard, 1996).

During the 1980s there was national concern about the rising teen birth rates. Although rates continued to rise into the early 1990s, in recent years, there has been a

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downward trend in teen birth rates. In 1995, the birth rate for 15- to 19-year-old females in the United States was 56.9 per 1,000 (Moore, Romano, & Oakes, 1996). Statistics for 1996 indicate that the teen birth rate was 54.7 for women ages 15 to 19 (Guyer, Martin, MacDorman, Anderson, & Strobino, 1997). Despite the current concern for the high teen birth rates, the rates are much lower than they were in the 1950s and 1960s, when the birth rate for women 15 to 19 years of age was 89 (Alan Guttmacher Institute, 1994).

Despite this recent downward trend, the U.S. birth rate is much higher than any other industrialized nation. For example, in Great Britain the teen birth rate is 32 per 1,000 and in Sweden 13 per 1,000. There are also major ethnic differences, with African American and Hispanic adolescents having almost twice the birth rate of whites (Alan Guttmacher Institute, 1994).

As a result of the widespread concern about adolescent childbearing, numerous intervention programs have been established with the goal of reducing adolescent pregnancy. These interventions range from pregnancy prevention education, to access to contraceptive services, to community-based life option programs, and they utilize a variety of approaches including hospital or clinic-based services and school-based services (East & Felice, 1996; Howard & McCabe, 1990; Zellman, 1982). This review summarizes theories of sexual behavior, existing intervention approaches to adolescent pregnancy and childbearing, and the role of psychology in adolescent pregnancy prevention.

THEORETICAL FRAMEWORK OF SEXUAL BEHAVIOR

A comprehensive, multidimensional theoretical model is absent from the literature on teen pregnancy. Such a theoretical model, however, is a necessary prerequisite to applying the preventive intervention research cycle (Heller, 1996) to decrease the incidence of teen pregnancy. The diverse theoretical models that have been applied to teen pregnancy need to be organized so that empirical evidence supporting specific agents can be revised and more comprehensive approaches can be tested. However, in our current state little is known about the determinants of adolescent pregnancy.

Although adolescent pregnancy occurs in all segments of the society, it is much more prevalent among adolescents living in poverty (Alan Guttmacher Institute, 1994). Based on the culture of poverty perspective (Lewis, 1968), pregnancy and parenthood may appear to be very positive options for youth living in disenfranchised communities with high rates of crime and few positive role models. In this context adolescents may adopt patterns of sexual behavior, parenthood, and work that differ from the larger society, but over time become normative and intergenerational (Moore, Miller, Glei, & Morrison, 1995).

While some investigators have suggested an emotional deprivation model (Musick, 1993) whereby adolescents seek emotional closeness by having a baby, others suggest that for most adolescents pregnancy is unplanned and the byproduct of teens' impulsivity, inability to modulate behavior in the face of potential consequences, or sense of invulnerability, together with family and community models of adolescent childbearing (Horwitz, Klerman, Kuo, & Jekel, 1991). Early initiation of sexual intercourse is often linked to other problem behaviors, such as substance use and school problems (Peterson & Crockett, 1992).

With little theory to guide research or practice, some pregnancy prevention programs have drawn upon existing theoretical models, primarily from psychology and

sociology. Many of these models are behavioral in nature and focus on how individual characteristics interact with the social context.

Social learning models have been helpful in conceptualizing pregnancy prevention programs. According to social learning theory (Bandura, 1986), individuals perform specific behavior because they imitate or model specific behavior exhibited by others. Although social learning theory is based on the traditional behavioral principles of reinforcement and stimulus control, behavior that is imitated according to social learning theory may or may not lead to immediate reinforcement. Some pregnancy prevention programs have utilized this conceptual framework to emphasize role modeling from peers who are not engaging in unprotected sexual intercourse or having babies (East, 1996a).

Ecological theory emphasizes the role of adolescents' environment in understanding behavior (Bronfenbrenner, 1979). The social environment extends from contexts that are closest to the individual such as the family and peers, and extends to more distal social contexts, such as the community and the neighborhood. At the most distal level, teenagers may be influenced by the political, cultural, and economic context. A pregnancy prevention program that incorporates a parent component aimed at increasing positive parent–teen communication is an example of one level of an ecological framework.

Other theories, more sociologic in nature, also provide information on the linkages between society and adolescent sexual behavior. Moore and colleagues posited the social isolation perspective (Moore et al., 1995), which asserts that youth face a lack of connection to the labor force. Without these connections youth cannot achieve success and therefore have few options for becoming productive members of society. Parenthood is one of the few options available.

Finally, at the individual level there are biological theories about the impact of hormones and genetics on sexual behavior. The biological theories are represented by work on pubertal development and menarche and endocrine-behavior relationships (Udry, 1988). Some theories of adolescent pregnancy have integrated biological and social models of human behavior, making them an important approach in conceptualizing adolescent pregnancy prevention (Irwin & Millstein, 1986; Udry, 1990).

PREGNANCY PREVENTION EDUCATION

Pregnancy prevention education is a common strategy, often referred to as family life education. Most of these programs provide information about sexuality, reproduction, decision making, and sexual relationship issues (Christopher & Roosa, 1990; Drolet & Clark, 1994; Kirby, 1984). In addition, they often promote abstinence as the major method of contraception. Many of the abstinence-based programs focus on attitudes regarding early sexual initiation and communication with parents and peers about abstinence related values. In general, pregnancy prevention education programs have been successful in increasing teen's short-term knowledge about contraception and reproduction, however, long-term impact is less certain. For example, the goal of the Human Sexuality, Values, and Choices program (Donahue, 1987) was to reduce teen pregnancy through knowledge about reproduction and societal values regarding abstinence. The intervention involved 15 class sessions for seventh and eighth graders. The evaluation plan consisted of self-administered questionnaires to program participants and a comparison group of students from the same school who did not

receive the classes. Evaluation data were collected at baseline prior to beginning the program, immediately upon completion of the course, and at 3 to 4 months follow-up after the end of the program. Results indicated that there were significant changes in attitudes immediately after completing the program, but there were no long-term changes in attitudes at the 3- to 4-month follow-up period. Similarly, the Teen-Aid Family Life Education Project (Weed, DeGaston, Prigmore, & Tanas, 1991) found that abstinence education significantly changed the attitudes and behavioral intentions of middle school participants in a pretest/posttest evaluation measure; however, no long-term impact was found.

Some abstinence-based programs have incorporated the teen's family and have targeted parent–teen communication as a method to reduce teen pregnancy. For example, the FACTS & Feelings program (Miller, Norton, Jenson, Lee, Christopherson, & King, 1993) found that at 3-month follow-up there was an increase in parent–teen communication among program participants. The program used videos and brochures to assist parents and adolescents from age 12 through 14 in discussing sexual issues at home. This program randomly assigned 548 families to one of three groups: families receiving videos and brochures, families receiving only the videos, and families who did not receive the video or brochures. Although initial findings looked promising, 1-year follow-up data revealed that communication levels had returned to baseline, indicating the need to sustain program success.

In general, programs that provide adolescents with factual information and skills to negotiate difficult interpersonal situations are more successful than programs that focus on knowledge alone. This finding is consistent with predictions from ecological and social learning theory and emphasizes the importance of providing skills training within a context that is familiar to adolescents (e.g., role plays). One such program is Postponing Sexual Involvement (Howard & McCabe, 1990). This program was developed in Atlanta, Georgia and was designed to provide adolescents 16 years of age and younger with skills to resist peer pressure to engage in high-risk behavior. The main message of the program was to delay sexual intercourse. The program consisted of 10 sessions, led by a male and female senior high student and targeted low-income students. Data were collected at the beginning, middle, and end of the eighth grade, and at the beginning and end of ninth grade. By the end of the eighth grade, comparison group males were three times more likely to engage in sexual intercourse than program participants. At the end of the ninth grade these trends were still present. At the end of the eighth grade, comparison group females were 15 times more likely to have engaged in sexual intercourse than program females. By the end of the ninth grade, effects had declined, but comparison group girls were still more likely to engage in sexual intercourse than girls participating in the program. However, when pregnancy rates were compared, there were no differences (comparison group 18% and participants 16%), indicating that the information provided was not successful in helping sexually active adolescents avoid pregnancy (Howard & McCabe, 1990).

Similar findings were reported by another evaluation of the Postponing Sexual Involvement curriculum (ENABL; Education Now and Babies Later), conducted in middle schools in California (Kirby, Korpi, Barth, & Cagampang, 1995). The program included classroom instruction, school activities such as assemblies and rallies, and incentive items such as pencils, water bottles, and stickers. Results indicated that although there were differences in knowledge, there was no impact on pregnancy rates.

Similar findings have been reported by at least four other universal pregnancy prevention programs implemented in schools or communities (Kirby, Barth, Leland, &

Fetro, 1991; Kirby, Korpi, Adivi, & Weissman, 1997; Mitchell-DiCenso et al., 1997; Vincent, Clearie, & Schluchter, 1987). For example, Reducing the Risk (Kirby et al., 1991) was a sex education program that included 1,033 students in health education classes in high schools throughout California. They were assigned to either the Reducing the Risk curriculum or to the existing sex education curriculum. Follow-up at 18 months indicated that adolescents receiving the Reducing the Risk curriculum were less likely to have initiated sex than comparison group adolescents. In addition, among sexually active adolescents, those in the Reducing the Risk classes were less likely to engage in unprotected sex. However, no impact on pregnancy rates was found.

In sum, sex education and abstinence-based programs have generally not been successful in reducing pregnancy rates among teens. Although some programs have found changes in attitudes regarding sexual behavior and/or increased knowledge about reproduction and contraception, few programs have had a long-term impact. Programs with a theoretical framework, that have specific goals, employ small groups and peer educators, and include community-based components seem to have the most potential for success (Moore, Sugland, Blumenthal, Glei, & Snyder, 1995). As a result, program developers have begun to incorporate an educational/informational component of teen pregnancy prevention into larger, more comprehensive programs.

CONTRACEPTIVE SERVICES APPROACHES

Many adolescents receive contraception services through family planning clinics (Mosher, 1990). Data from the 1988 National Survey of Family Growth indicates that approximately 2.8 million 15- to 19 year-old females were seen by a health-care provider for family planning-related issues (Moore, Sugland, et al., 1995). Adolescents are more likely to use family planning clinics if services are teen friendly and offered in an accessible manner (Hughes, Furstenberg, & Teitler, 1995).

Although many of the studies conducted on the effects of family planning clinics on adolescent pregnancy found that family planning programs reduce adolescent pregnancy (e.g., Forrest, Hermalin, & Henshaw, 1981; Lundberg & Plotnick, 1990; Singh, 1986), they were often fraught with methodological limitations and lacked an experimental or quasi-experimental design. However, brief family planning visits alone do not have an impact on adolescent pregnancy prevention (Kirby, 1997). Despite such limitations, family planning clinics could be an important component of teen pregnancy prevention programs, particularly if regular access to contraception is combined with psychosocial counseling and community-based programs (Kirby, 1997).

Timing of contraceptive services is an important consideration to ensure that adolescents are protected prior to their first intercourse. Zabin and Clark (1983), for example, found that adolescents delay contraceptive services for almost a year after first intercourse. In addition, one third of adolescents made their first family planning clinic visit because they thought they were pregnant (Zabin & Clark, 1981).

Although there are few family planning programs that have been able to successfully document reduction in teen pregnancy rates, such programs may be useful in promoting healthy, responsible behavior, related to contraception. One clinic-based pregnancy prevention initiative in Philadelphia (RESPECT; Hughes et al., 1995) involved tailoring services to the needs of adolescents. It incorporated additional hours

for teens and trained staff regarding the special needs of adolescents. The program also offered a media campaign, and school- and community-based components. Results of this city-wide program indicated that although adolescents who received the teen-friendly services were more likely to continue using a birth control method than were control group youth who received traditional contraceptive services, the differences were not statistically significant.

Another program (Winter & Breckenmaker, 1991) involved both psychosocial counseling and medical appointments over two clinic visits. The evaluation utilized a large study sample (518 program participants, 738 comparison group participants). Results indicated that adolescents who received two visits had higher contraceptive use at 6 months follow-up than comparison group adolescents who had only one visit. In addition, pregnancy rates were lower for program participants (4.0%) than comparison group participants (7.8%). These findings are encouraging and suggest the need to provide integrated services.

School-based clinics provide primary health care to students who may otherwise face barriers to accessing care. Although school-based clinics often incorporate counseling and education into their programs, fewer than 18% actually provide contraceptive services on-site (Peterson & Brindis, 1995). In addition, their services are often limited to students, thus missing the highest risk youth who may have dropped out of school (Kirby, 1997).

One of the first of school-based programs was the St. Paul Maternal and Infant Care Project (MIC; Edwards, Steinman, Arnold, & Hakanson, 1980). This program provided comprehensive care in middle schools and high schools for over 20 years. Services included sex education, family planning counseling, and pregnancy testing with contraception provided at a nearby hospital clinic. An initial evaluation conducted in the 1970s found that there was a 56% reduction in birth rates between 1973 and 1976, however, there was no comparison group, so it is uncertain whether the reductions in pregnancy rates were due to program participation or to other factors.

One successful school-based program in Baltimore, MD provided middle and high school students with classroom instruction, group discussion, and individual consultation regarding sexuality and reproduction (Zabin, Hirsch, Smith, Street, & Hardy, 1986). A community clinic provided contraceptive services across the street from the high school and a nurse and a social worker provided individual counseling education about reproduction and contraception. Presentations were made in homeroom classes, during lunch hours, and after school. A peer leader component was also utilized for small group discussion. Results of this program indicated that pregnancy rates for adolescents participating in the program decreased 30%, while pregnancy rates for comparison group adolescents not enrolled in the program increased by 58% (Zabin et al., 1986).

Other programs have examined the effect of school-based health centers on contraceptive behaviors, but results have been equivocal. For example, one group of investigators found that students who utilized a school-based clinic had a delayed onset of first intercourse (Kisker, Brown, & Hill, 1994), while another group reported that involvement in a school-based clinic did not affect the onset of intercourse (Kirby, Waszak, & Ziegler, 1991). Both groups reported no effect on pregnancy rates.

In general, programs that provided access to contraception have had mixed results in reducing teen pregnancy rates. The most successful programs have targeted contraceptive use by promoting problem solving and decision-making skills and addressing barriers to contraception access (Moore, Sugland, et al., 1995). Strategies that have in-

cluded enhancing communication regarding contraception among the teen's family members have generally not been successful in reducing pregnancy rates (Moore et al., 1995; Namerow & Philliber, 1982). Although many adolescents receive contraception from family planning clinics, it is unclear whether family planning clinics change adolescent contraceptive behavior or pregnancy rates.

COMMUNITY-BASED LIFE OPTIONS PROGRAMS

In recent years, community-based pregnancy prevention programs have become more common. Some stem from grass-root agencies, such as Plain Talk, a program designed to enhance knowledge about sexuality and communication between adolescents and adults (Delgado, 1994). Others are partnerships formed between communities and hospitals or universities to develop community-based pregnancy prevention programs. For example, the Adolescent Pregnancy Prevention Coalition of North Carolina is a group of community members and professionals who assist groups in the community to implement programs to reduce adolescent pregnancy (Moore, Sugland, et al., 1995). The statewide coalition has followed state teen pregnancy rates since 1978. Although there has been a downward trend in pregnancy rates since the early 1990s, there has been no formal evaluation of the coalition.

Community media and outreach campaigns have also become more prevalent. For example, as part of a national program aimed at encouraging young men to buy condoms, a brochure including information about sexually transmitted diseases, pregnancy, and birth control was mailed to 16- and 17-year-old males living in low-income areas across the country. A telephone interview conducted 5 weeks after the mailing indicated that males who received the brochure had greater contraception knowledge. However, there were no differences between males who received the mailing and males who did not receive the mailing on actual condom use (Kirby, Harvey, Claussenius, & Novar, 1988).

Another community marketing campaign, Project Action (Polen & Freeborn, 1995), utilized public service announcements, condom vending machines and small group workshops focusing on decision-making skills. Results of the program indicated that during the campaign there was a significant increase in condom use with casual partners, however, after the campaign ended, condom use returned to preprogram levels.

Many community-based programs incorporate elements of ecological theory as they extend beyond pregnancy prevention to enhance adolescents' life options. For the most part, these programs have been successful in preventing pregnancy. Four of the five comprehensive programs included in this review were effective in reducing rates of pregnancy. The first program was the Teen Outreach Program (Allen, Kuperminc, Philliber, & Herre, 1994), a school-based program that included a community service component. The weekly educational discussion component includes topics such as decision-making, parenting, family relationships, communication skills, life options, and values clarification. Results indicated that adolescents who were less likely to become pregnant and to drop out of school while they were participating in the program.

The second program was the Children's Aid Society's Teen Pregnancy Prevention Program (Carrera & Dempsey, 1988). It provided comprehensive services including recreational programs, education regarding family life, physical and mental health services, a job club, mentoring, and guaranteed admission to Hunter College. The

program used a variety of approaches, including a performing arts component in which adolescents participated in music, dance, and drama. The program has been replicated in other areas and evaluation results indicated that adolescents participating in the program were more likely to complete school, attend college, and are less likely to become pregnant than the national average (Philliber, 1994).

The third program, and the only one that did not demonstrate a decline in pregnancy rates, was the Summer Training and Education Program (STEP). This program was designed to address the occupational and educational situations of highly disadvantaged adolescents in an effort to reduce adolescent pregnancy (Grossman & Sipe, 1992). This program had several components, including job training, a reading and math curriculum, information on reproduction, and problem-solving skills. Approximately 4,800 adolescents from disadvantaged areas were randomly assigned to treatment and control groups. The control group received only summer employment. Results of the evaluation indicated that there were significant increases in knowledge regarding reproduction and contraception, however, there was no impact on pregnancy rates.

The fourth program, entitled the Youth Incentive Entitlement Pilot Project (YIEPP; Olsen & Farkas, 1990), provided jobs to low-income adolescents. Jobs were offered both during the school year and during the summer. Results of the program indicated that adolescents who participated in the program were less likely to become pregnant than adolescents who did not participate in the program.

The final program examined the impact of concrete monetary investments in adolescents, rather than job training *per se* on rates of adolescent pregnancy. The Quantum Opportunities Program (QOP, Sylvester, 1994) paid program participants for each hour they participated in the program. They could also work toward a savings account for college or job training and receive bonuses for every 100 hours they participated in the program. Adolescents in the program received counseling and remedial work in math and English. Results of the program indicated that there were no differences between program participants and comparison group participants at 1-year follow-up, however, differences were observed at 2 years with fewer program participants becoming pregnant.

Community-based life options programs appear to be a promising approach in teen pregnancy prevention, perhaps because they are ecologically oriented and focus on skill-building in areas that extend beyond pregnancy. When adolescents gain competence and confidence in their academic or employment skills, they may feel less pressure to define success by becoming a parent. Increasing educational and employment incentives for adolescents may be an effective approach to preventing pregnancy among teens.

PROGRAMS AIMED AT REDUCING REPEAT PREGNANCY

Approximately 30 to 35% of all adolescent mothers have a repeat pregnancy within 2 years after their first delivery (East & Felice, 1996; Hofferth & Hayes, 1987). In general, programs aimed at reducing repeat pregnancy have not been successful (Bloom, Fellerath, Long, & Wood, 1993; Polit, Quint, & Riccio, 1984). One program aimed at reducing repeat pregnancy provided a monetary incentive in addition to peer support to reduce repeat pregnancies among adolescent mothers whose infants were less than 5 months of age (Stevens-Simon, Dolgan, Kelly, & Singer, 1997). A randomized con-

trol trial was utilized to place participants into one of four groups: monetary incentive and peer support, monetary incentive only, peer support only, or no intervention. Participants met once a week at community health centers and received a total of $7 per week if they did not become pregnant. Recent results of this program indicated that at 6, 12, 18, and 24 months there were no differences among intervention groups with regard to repeat pregnancy.

One program that has been successful is a home visitation program that provides intensive counseling and comprehensive health services (Olds et al., 1997). This rural program found that at 15 years postpartum, program participants had fewer repeat pregnancies and delayed the birth of the second child longer than comparison group mothers.

In sum, programs designed to reduce repeat pregnancy among adolescent mothers have generally not been successful. The one program that has been successful (Olds et al., 1997) was based on an ecological model that involved other family members, focused on the health and well-being of the adolescent and her first child, and extended beyond the prevention of a second pregnancy.

Characteristics of Effective Programs

Although there have been multiple approaches to the prevention of adolescent pregnancy, few programs have had a significant impact on reducing teen pregnancy. Kirby (1997) has summarized the primary characteristics of effective pregnancy prevention programs for teens. First, effective programs focus on sexual behaviors that lead to pregnancy, such as using contraception or initiation of sexual intercourse, and include clear messages about prevention. Second, effective programs are developmentally appropriate and culturally sensitive to the program participants. For example, programs may need to be tailored differently for middle and senior high school students and for African American and Hispanic adolescents. Third, effective programs are based on theories of behavior change. Social learning theory (Bandura, 1986) has been used by some program developers to address the societal pressures associated with teen pregnancy and to help adolescents resist these pressures. Theories that focus on perceived susceptibility to pregnancy and the costs and benefits of behavior associated with pregnancy also may be useful. Fourth, programs need to be of sufficient duration for the teen to acquire the skills that are necessary for pregnancy prevention (e.g., negotiation). Programs lasting 14 or more hours have more opportunity to complete educational activities. Fifth, programs that utilize a variety of teaching methods including didactic instruction, homework activities, and role playing may be more effective than those that rely on a single method. Sixth, successful programs incorporate societal/peer pressures related to sexual behavior. Seventh, successful programs offer modeling and practice with regards to communication and assertiveness. Finally, effective programs have staff who believe in the program and offer specific, skill building activities for participants.

Limitations

Most programs aimed at reducing adolescent pregnancy have not met the criteria outlined by Kirby (1997). First, programs have generally not been guided by a theoretical framework. A theoretical, hypothesis-driven basis would illuminate the specific goals and objectives of the program, emphasize the processes to be used during implemen-

tation, and clarify the evaluation plan (Kirby, 1997; Moore, Sugland, et al., 1995). A second limitation is that many of the evaluations associated with pregnancy prevention programs have had methodological problems and constraints. Sample sizes have often been small and the use of experimental designs has been infrequent, with few programs employing the use of random assignment. In addition, few programs have conducted long-term follow-ups. A third limitation is that programs have reported inconsistent results. While some programs appear to reduce teen pregnancy, similar programs do not. As a result, there is a need for more rigorous program replication. A fourth limitation is that as programs become more comprehensive with multiple program components, it is difficult to differentiate effective from ineffective components or to determine the level of intensity required by program participants. Some youth may require long-term, intensive intervention, whereas others may require merely information and contraceptives. Finally, a fifth limitation among pregnancy prevention programs is that most programs are developed without regard for knowledge already obtained from other programs (Moore, Sugland, et al., 1995). Programs need to disseminate the result of their evaluations, whether successful or not, to enhance the development of new and innovative interventions.

Implications for Psychologists

Psychology has much to offer teen pregnancy prevention. Given the lack of theory among most pregnancy prevention programs, psychologists could provide important expertise in the areas of program design and development. Psychologists may be particularly useful in linking theories of sexual behavior and adolescent development to prevention. One of the benefits of grounding intervention programs in theory is that clearly defined intervention strategies emerge. For example, programs based on social learning theory would include sessions on how to avoid behaviors through role playing and modeling of socially desirable behaviors by peers or teachers. In turn, a broader ecological perspective would call for a multifaceted approach requiring family, school, and/or community involvement.

In addition to program design and evaluation, psychologists may also be involved in program intervention. Psychologists providing counseling and therapy to adolescents and their families may be able to intervene at the individual and family levels. They can assist adolescents with mental health-related, issues including depression, sexual abuse, or substance abuse. Psychologists can also facilitate healthy development in the children of adolescent parents through interaction coaching and other developmental strategies.

Adolescent pregnancy and childbearing are associated with multiple problems and risk factors, including family marital disruption, lack of parental support and supervision, sexual abuse, drug and alcohol use, delinquency, low educational performance and expectations, and low expectations for the future (Zabin & Hayward, 1993). Pregnancy prevention programs need to consider these problems and provide appropriate intervention or referrals to mental health providers where necessary. Thus, the most effective programs are likely to be comprehensive and interdisciplinary (East & Felice, 1996). In addition to providing information about reproduction and contraception services, programs need to include psychosocially based components, including decision-making, problem-solving, and communication enhancement.

Finally, psychologists often work with adolescents in other settings including hospitals, schools, and private practice. Reproductive health is a critical developmental is-

sue for adolescents as they confront increasing pressure to be sexually active. Intervention into areas, such as stress and coping, problem-solving skills, communication skills, self-esteem, parent and peer relationships, and support should include a focus on pregnancy prevention.

AREAS FOR FUTURE STUDY

As this review has indicated, there are many unanswered questions in adolescent pregnancy prevention. Basic research needs to be conducted into the perceived benefits of pregnancy for youth, the role of older males in adolescent pregnancy, and the role of other family members. Research is also needed in the application of theories to program development and the most effective methods to reach adolescents.

There are multiple predictors of adolescent pregnancy and childbearing (Moore, Miller, et al., 1995). Poverty, family breakdown, school failure, problem behavior, abuse, and being the child of an adolescent parent increase the risk for adolescent pregnancy. Although many theories of sexual behavior point to the need to include personal, family, social, and cultural factors, there are relatively few programs that address these issues from a multifaceted approach. Pregnancy prevention efforts need to address issues that go beyond individual decisions about contraception and fertility, by recognizing the impact of family, neighborhood and community influences on reproductive behavior.

Few programs have included males or other family members in their interventions. As ecological theory indicates, involving family members and peers can be important intervention components. For many years research on adolescent pregnancy focused only on females, virtually ignoring males. However, in recent years studies have begun to address the partners of adolescent mothers (Hardy, Duggan, Masynk, & Pearson, 1989; Panzarine & Elster, 1983). Young fathers have many of the same characteristics as young mothers including low educational and occupational attainment and intergenerational patterns of early parenthood (Dryfoos, 1990; Panzarine & Elster, 1983). However, many fathers of the children born to teen mothers are not themselves teens (Hardy et al., 1989). Programs need to incorporate males and consider the role of males in teen pregnancy and childbearing.

Programs also need to intervene with other members of the teen's family and enlist their help and support. The intergenerational patterns of teen pregnancy and parenting have been well-established (Burton, 1990, 1996) and family instability often precedes adolescent pregnancy. Thus, programs to enhance family functioning and promote strong, cohesive families should lead to pregnancy prevention.

Recently, programs have also begun to focus on the younger sisters of teen mothers (East, 1996b). Females whose older sister was a teen mother were almost four times as likely to have initiated sexual intercourse than females whose older sister was not a teen mother. Adolescent mothers are strong role models for early parenthood to younger sisters (East, 1996b; East & Felice, 1992).

Future programs should be developmentally and culturally sensitive and address the specific needs of adolescent subgroups, including younger and older adolescents, as well as those from differing ethnic backgrounds (East & Felice, 1996). Culturally based programs focus on the positive contributions of a cultural group with the belief that by strengthening the awareness of cultural heritage, adolescents will be less likely to engage in health risk behaviors. Pregnancy prevention programs have begun to in-

corporate culturally based strategies (Foster, Greene, & Smith, 1990). For example, the Rites of Passage is an Afrocentric program focusing on African history, culture, and traditions (Asante, 1987). Although pregnancy prevention has been incorporated into such programs, there have been few evaluations.

Similarly, different strategies are needed for adolescents who have not yet experienced a first pregnancy and adolescents who have already given birth. In a recent study, East and Felice (1996) found that not returning to school within 6 months following delivery, receipt of governmental assistance, and increased child-care assistance from the teen's mother were all associated with a rapid repeat pregnancy within 2 years after first delivery. Programs in which young mothers return to school within 6 months postpartum are more successful in preventing repeat pregnancy and birth (Stevens-Simon, Parsons, & Montgomery, 1986) than programs only focusing on education and provision of contraception (Maynard & Rangarajan, 1994). However, some adolescent mothers may intentionally choose to become pregnant a second time (Matsuhashi, Felice, Shragg, & Hollingsworth, 1989), highlighting the importance of focusing on teens' motivations.

Finally, program evaluation and replication are crucial in the area of teen pregnancy prevention. We have learned that simple, single message programs are unlikely to be effective. As program effectiveness is demonstrated, such as programs that include life options (Allen et al., 1994; Carrera & Dempsey, 1988; Olsen & Farkas, 1990; Sylvester, 1994), replication studies are needed to examine the programs in other communities and with other youth.

Policies Aimed at Reducing Teen Pregnancy

In response to the high rates of teen pregnancy the federal government legislated the Adolescent Family Life Act in 1981 (AFL). The main objective of the AFL was to decrease the negative consequences associated with adolescent pregnancy and parenting. As part of this legislation the Adolescent Family Life Program was created as part of the Office of Population affairs of the U.S. Public Health Service. The AFL programs have funded both demonstration, care, and research projects related to adolescent pregnancy and parenting.

In recent years other organizations have been created to reduce the high rates of pregnancies and birth to teens. For example, The National Campaign to Prevent Teen Pregnancy has a goal to reduce teen pregnancy by one third by the year 2005. Numerous state initiatives have also been developed. For example, the California Department of Education implemented a grant program to prevent teen pregnancy targeting high-risk youth (California Senate Office of Research, 1997). Similarly, the State of Maryland formed the Governor's Council on Adolescent Pregnancy Prevention and funds pregnancy prevention programs.

CONCLUSIONS

In summary, there have been few successful teen pregnancy prevention programs, largely because there are few effective theories to guide program development and evaluation. Programs that have been most successful have extended beyond reproductive health to include life options, such as education and job skill training. Psychologists have much to offer in the link between theory and program design and evalua-

tion, and in program implementation. Future research is needed to understand factors that predispose teens to early childbearing and to develop developmentally and culturally appropriate disincentives to pregnancy. Only through such efforts will we be able to identify the most effective interventions that will reduce teenage pregnancy and childbearing and the negative sequelae associated with it.

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