HHS Public Access

Author manuscript

Annu Rev Public Health. Author manuscript; available in PMC 2015 March 05.

Published in final edited form as:

Annu Rev Public Health. 2013 ; 34: 253–270. doi:10.1146/annurev-publhealth-031811-124619.

Promoting Healthy Outcomes Among Youth with Multiple Risks: Innovative Approaches

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Abstract

Adolescent behavior problems such as substance use, antisocial behavior problems, and mental health problems have extremely high social costs and lead to overburdened mental health and juvenile justice systems in the United States and Europe. The prevalence of these problems is substantial, and at-risk youth often present with a combination of concerns. An understanding of risk and protective factors at multiple levels, including the child, family, peer, school, and community, has influenced intervention development. At the individual and family levels, the most effective and cost-effective programs work intensively with youth and their families or use individual and group cognitive-behavioral approaches. However, there is a paucity of careful studies of effective policies and programs in the juvenile justice system. Research is needed that focuses on adoption, financing, implementation, and sustainable use of evidence-based programs in public service systems. In addition, the field needs to understand better for whom current programs are most effective to create the next generation of more effective and efficient programs.

Keywords

problem behavior; antisocial behavior; interventions; prevention; comorbidity

INTRODUCTION

Adolescence has long been recognized as the developmental period during which delinquent and criminal behaviors are most likely to emerge. Adolescent problem behaviors include high rates of antisocial behavior, delinquency, substance use, and other risky behaviors and, when they occur together, signal substantial risk for difficulties that continue into adulthood. Adolescence is known to be characterized by a greater rate of problem behaviors than are either prior or subsequent stages of development, which has led to intense interest in how multiple influences prior to and during adolescence impact variation in adolescent functioning (45).

DISCLOSURE STATEMENT

Dr. Greenberg is an author of the PATHS® Curriculum and has a royalty agreement with Channing-Bete, Inc. Dr. Greenberg is a principal in PATHS™ Training, LLC.

Adolescence is a watershed period of development because it presents youth with both opportunities and challenges that can have lasting effects across the life span. Adolescence is characterized by rapid changes in biological, physical, psychological, and cognitive development (78, 79, 131). The biological and emotional changes increase youths' vulnerability to emotional and behavioral disorders as indicated by the increased incidence of almost every form of mental/emotional disorder during adolescence (91). Furthermore, the growing independence of youth combined with the social/media and peer-related pressures increase teens' involvement in health-compromising behaviors (87). How adolescents navigate these developmental changes is linked to adjustment in young adulthood and later life (27, 131). This article reviews the epidemiology, risk, and protective factors associated with adolescent problem behaviors and reviews the most promising interventions to reduce their impact.

THE EPIDEMIOLOGY OF YOUTH MENTAL AND BEHAVIORAL DISORDERS

The behavioral and emotional challenges associated with adolescence are of considerable public health concern. We discuss prevalence and trends for substance use, antisocial behavior, and mental disorders in the United States. Little careful epidemiological or longitudinal data exist on lower- and middle-income countries (17).

Prevalence and Trends

Substance use—In spite of recent declines in the rates of alcohol use, recent reports estimated that 50% of adolescents have been drunk by the time they finished high school, and 33% reported having had alcohol by eighth grade. Fifteen percent of eighth graders reported having been drunk (70). Johnston et al. also reported that 45% of youths had tried cigarettes by the time they were seniors in high school, and one out of five twelfth graders reported that they currently smoked. Additionally, 47% reported having tried an illicit drug by twelfth grade. National rates for substance use disorders for youth aged 13–18 are estimated at 11.4% (17).

Mental disorders—The rates of mental disorders increase in adolescence (3, 4): One in five adolescents reports mental health problems (73). A striking 50% of adult mental disorders have an onset during or before adolescence (10). National rates for behavioral disorders for youths aged 13–18 are estimated at 19.1% (91). Data also show substantial increases in the rates of anxiety and depression in US adolescents compared with previous generations (136). Two nationally representative samples show that more than 10% of youth report moderate-to-severe symptoms of depression (114) and 14% report any mood disorder (91). These problems in adolescence have been linked to adult criminality, substance use disorders, psychopathology (88, 108, 109), and morbidity in adult life (87).

Antisocial behavior and delinquency—Antisocial behavior problems in adolescence represent a major dilemma for American society. Homicide is the second leading cause of death for young people ages 10–24 years old; 86% of victims are male and 14% are female (18). In 2008, more than 656,000 young people ages 10–24 were treated in emergency departments for injuries sustained from violence (18). In a 2009 nationally representative study of youth in grades 9–12 (19), 31.5% reported being in a physical fight in the past year

with almost twice as many males as females involved; 17.5% reported carrying a weapon (gun, knife, or club); and 19.9% reported being bullied on school property in the previous year with a slightly higher prevalence for females (21.2%) than males (18.7%). Furthermore, national statistics indicate that youth accounted for 16% of all violent-crime arrests in 2008 (106). Numerous longitudinal studies in the United States, Western Europe, and Australia have led to the consistent finding that antisocial and deviant behavior that emerges early in the life course tends to continue into childhood, adolescence, and adulthood (38, 44, 104).

Problem covariation—Although some youth have only one problem or concern such as substance abuse, conduct problems, depression, or anxiety, comorbidity of these problems indicates greater continuity of disorder and impact into adulthood. A substantial empirical literature on covariation of problems has supported the model of problem behaviors, first proposed by Jessor in 1977 (69). This model proposed that there was a syndrome of problem behaviors that were commensurate with the adoption of an unconventional, deviant lifestyle (68). Substantial evidence indicates that delinquent behaviors are highly correlated with early sexual debut and risky sexual behavior, academic failure, dropout, and violence in the United States as well as in other upper-income societies (94). Studies demonstrate that increases in one behavior are also linked to increases in others. For example, increases in alcohol use are related to increases in illegal drug use, delinquency, and academic problems (39). Similarly, early alcohol use and aggression show an interactive relationship; one behavior predicts increases in the second. Statistical modeling indicates that there is one overall higher-order factor for problem behavior that also has second-order subfactors for specific problems.

Although there are substantial relationships between risky behaviors, there is also substantial person-level variation; some youth show only transient and single concerns. However, other youth exhibit multiple problem behaviors (42). This variation is illustrated by the findings from the Pathways to Desistance study, which followed 1,300 serious juvenile offenders for 7 years after their first conviction. The findings indicate continuing relationships between substance use and offending into young adulthood; 35% of youth met *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) criteria for drug or alcohol abuse/dependence at first arrest. Moreover, those with a substance use disorder had higher rates of delinquency and arrest (98).

Comorbidity and the key role of chronic antisocial behavior—Because of its pervasive effect on all aspects of society—it impacts family life, academic achievement and graduation rates, costs associated with criminality, and victims' pain and suffering—chronic antisocial conduct problems in adolescence represent the greatest concern. In addition, chronic antisocial behavior also shows substantial comorbidity with both depression (57) and substance abuse (5). Conduct disorders account for the majority of referrals to outpatient child and adolescent mental health clinics (86) and placements in special education classes (72).

Although the age-crime curve for delinquency indicates that aggregate crime rates peak in the teenage years and then begin to decline (13, 45), some offenders continue serious and persistent antisocial behavior well beyond adolescence (20) and exhibit antisocial

personality disorder in adulthood (74). Even though the base rates of adolescent delinquency and violence are high in adolescence, a small minority of persons perpetrate the great majority of violent acts. In the well-studied Philadelphia cohort of 2,845 boys born in 1958, study data estimated that ~4% of the population (16% of juvenile offenders) represent 51% of all police contacts (26).

The Costs of High-Risk Youth

Economic analyses have estimated the costs of high-risk youth, defined as those who regularly commit crimes, are violent to others, engage in heavy substance use, and are likely to drop out of high school. The present value of saving a single high-risk youth from a life of crime is estimated to be $2.6–$5.3 million at age 18, and such estimates are adjusted to account for the fact that the three categories of crime, drugs, and high school dropout are not mutually exclusive. Costs savings are higher if problems can be averted before adolescence because youth who pursue a lifetime of crime often begin offending prior to adolescence (43).

Because of the cumulative and increasing costs that arise from multiple arrests and the deepening of the offender process, early interventions that divert high-risk youth early in their criminal career are especially cost-effective. For example, the costs through age 26 for youth with one lifetime police contact are estimated to be $200,000; costs for youth with 2+ police contacts are estimated at 1.3 million; and costs for youth who are persistent offenders (i.e., those who have 15+ police contacts) are estimated between $3.6 and $5.8 million (26).

RISK AND PROTECTIVE FACTORS

Identification of risk and protective factors that may work together to influence the development of youth behavior problems has deepened our understanding of how to prevent complex adolescent health and behavior problems. The influence of risk and protective factors on development may be additive and/or interactive. Risk and protective factors can be best characterized into one of six domains: child, peer, family, demographic, school, and community/policy.

Child-Related Factors

A key risk factor for problem behavior is the child's self-regulatory abilities (24, 55). Children who are characterized by poor behavioral regulation (the ability to control or regulate impulsive behaviors) and emotion regulation (ability to modulate high states of negative emotion) are at great risk for all forms of problem behavior, poor academic outcomes, and substance use problems (93). Poor regulation likely interacts with other risk factors (i.e., youth with poor regulation skills may be less equipped to resist peer pressure) (47).

These regulation difficulties have been linked to deficits or delays in the development of the executive functions of inhibitory control, working memory, and planning (110). Various theoretical models have conceptualized differences at the neural level for youth who have low regulation skills. These models have identified structural differences in subareas of the prefrontal cortex as well as functional explanations for how risk is conferred by individual

differences in how youth process reward-related contingencies in cognitive processing (48, 107).

Peer-Related Factors

Deviant peer relationships, associating with other youth who engage in deviant behaviors (e.g., antisocial behavior, early substance use), is one of the strongest risk factors for problem behavior, especially delinquency (35, 95). Youth are more likely to use drugs and engage in delinquency if their peers are doing so (123). Research illustrates that deviant peer groups may engage in deviancy training, using humor and the exchange of stories to encourage and reinforce problem behavior (35). Although there has been considerable controversy regarding the impact of deviant peer groups in the treatment process (139, 140), some investigators believe risk for increased problem behavior is heightened when youth are treated in some group contexts or reside in group homes (22, 115). That is, if youth who exhibit problem behavior are treated together, it may increase their risk for additional problem behaviors.

The influence of peers begins prior to adolescence. Elementary-aged children who are aggressive and experience peer rejection are more likely to develop hostile attributions, to associate with other rejected children who provide few opportunities for positive social skill development, and to continue to progress toward problem behavior (37). Thus many youth who exhibit antisocial behaviors may have a history of deviant peer relationships that began prior to adolescence and that continues through the adolescent period.

Family-Related Factors

Substantial evidence indicates that parental warmth and caring influence adolescent problem behaviors. Low-quality parent-child relationships, poor communication of parental values and expectations, and parenting strategies, such as harsh discipline and low levels of parental monitoring, have been associated with antisocial behavior and early substance use (14, 24). In contrast, positive parent-child relationships, effective communication, healthy attachments, and an authoritative parenting style (e.g., high in warmth and effective discipline) can be protective factors (2, 12, 32).

Much of the effect of parenting occurs through its influence on other risk factors, particularly the development of regulation and the selection of friends who engage in problem behavior. Youth who experience insensitive, harsh parenting or those who are poorly monitored are less likely to develop effective emotional regulation strategies and more likely to form deviant peer relations (14, 34, 96). Some aspects of the parenting relationship may be the result of various aspects of genetic transmission (15). More importantly from an intervention standpoint, quality parenting in childhood and adolescence can reduce the potentiation of genetic risk and divert youth from risky trajectories (6).

Demographic Factors

Adolescents are also strongly influenced by the broader family context, including family income, family structure, and the quality of marital relationships. Poverty has been associated with greater rates of delinquency, school failure, and dropout (99). Some of the

effects of poverty are mediated by stressful family circumstances that may result in less warmth and poor family management in low-income families (11, 90). Being raised in a single-parent home increases the likelihood of living in poverty and other risks, but the manner in which the custodial parent manages the family life may be as or more important than the family structure. Youth raised in homes with high rates of interparental conflict are also at increased risk for aggression, delinquency, and substance use (31).

School-Related Factors

Both school failure and low commitment to school increase the rate of antisocial behavior (44, 70). Students who feel more connected to their schools and cared for by teachers show higher academic motivation and earn higher grades. Students who feel more connected to their school are also less likely to engage in problem behavior, such as delinquency (59, 100).

Community Factors

Community characteristics have also been linked to substance use and delinquency. Yoshikawa et al. (143) have found associations between growing up in concentrated poverty and living in disadvantaged communities with low academic achievement, school dropout, and delinquency. High-crime neighborhoods may increase children's exposure to violence and can be highly detrimental. Dodge & Pettit (38) link exposure to violence to increased risk of antisocial behavior. Other community characteristics, such as the availability of liquor stores and the enforcement of laws on selling liquor, have also been linked to substance use and delinquency. Youth whose communities provide easy access to obtain alcohol and other drugs and/or have permissive norms are at great risk (24, 25, 58).

Theories on Risk and Protective Factors

Risk factors often potentiate each other, and clear evidence shows that a greater number of risks predicts more antisocial behavior (94). Taking a developmental perspective, risk factors are likely to have a cascading influence: One risk factor in one domain often leads to risk in another domain (38). For example, a study of children in three US cities and one rural location found the following progression for both boys and girls: Early disadvantage predicted early harsh and inconsistent parenting, which predicted social and cognitive deficits, which led to elementary school social and academic failure, which predicted parental withdrawal from supervision and monitoring, which increased the likelihood of adolescent association with deviant peers, which predicted the ultimate outcome of serious violence in adolescence (37).

A central theoretical focus of research has been understanding the key role of parenting practices in a chain leading to antisocial behavior. Patterson and colleagues (103) outlined a cycle of coercive patterns, where ineffective parenting in early childhood exerts cumulative effects over time, leading to child aggression, peer rejection, and academic failure in middle school and peer deviance and delinquency in adolescence. Both social control theory (66) and the Seattle Social Development Model (16) suggest that youths' bonds to their parents and prosocial institutions, such as schools, influence risky behaviors. Prosocial bonds that youth develop to parents, teachers, and other adults may act as informal controls that support

the internalization of positive values and prosocial behavior. In contrast, students without prosocial bonds may develop stronger connections with deviant peers, may assume the values and norms of such peers, and are more likely to engage in risky behavior.

INTERVENTIONS THAT WORK

Over the past two decades, a number of interventions have been carefully tested to examine their effects on youth mental disorders, delinquency, and serious substance abuse. Here we highlight the most effective programs in the US context as well as a number of promising approaches. They focus on individual treatment/rehabilitation, family/ecological approaches, and policies and programs related to juvenile courts.

Cognitive-Behavioral Treatments

Cognitive behavior therapies (CBTs) have been widely used as a primary therapeutic model in both individual and group treatment of adolescents with aggression, substance use disorders, delinquency, and comorbid conditions. CBT encompasses a variety of methods aimed at present-focused, goal-directed behavior change. CBT focuses on correcting dysfunctional thinking and behaviors associated with various problem behaviors (75).

Meta-analyses of CBT programs have shown effectiveness in reducing recidivism rates (75, 139). Analyses for juvenile offenders showed greater effect sizes with higher-risk offender populations and when programs incorporated anger control and interpersonal problem-solving components. One brand-name program example is Aggression Replacement Therapy (ART), which is a ten-week intervention that includes training in social skills, controlling anger, and moral reasoning. ART has shown effects on aggression, delinquency, and recidivism (51). Other promising models include Dialectical Behavior Therapy, which combines cognitive therapy with modules on mindfulness, distress tolerance, and emotional regulation and CBT models focusing on child trauma, although there is still little quality outcome data on the effectiveness of these approaches (92). A meta-analysis indicated that CBT is effective for substance use problems in teens (139).

Family-Based Programs

With logic models based on the risk and protective factors discussed above, family-based interventions have been identified as effective approaches to addressing youth substance use and delinquency and improving academic outcomes (82, 139).

The Family Check Up—The Family Check Up (FCU) is part of an adaptive tiered intervention called the Adolescent Transitions Program (ATP), which is delivered in middle schools. ATP includes both a universal intervention, which involves a family resource center that provides brief consultations and general information on parenting, as well as a more targeted intervention. Youth identified as at risk for problem behavior are offered the FCU, which includes three sessions of child and family assessments and a feedback session. The FCU aims to help families identify strategies for change and to motivate them to improve parenting skills such as communication, encouragement, and parental involvement/quality time. After receiving feedback, families who require additional services are offered them (36).

Compared with youth in a randomized control group, youth receiving FCU had lower rates of increases in substance use, antisocial behavior, and deviant peer friendships and showed improved academic outcomes in both the middle-school and high-school periods (28, 132, 137). FCU youth also had fewer arrests during high school (29). Improvements in parenting significantly mediate the outcomes of risky behavior via higher parental monitoring and reductions in family conflict (33, 137). Studies also suggest that program effects on antisocial behavior may be mediated by reductions in deviant peer relationships (137).

Functional Family Therapy—Functional Family Therapy (FFT) is a selective and indicated intervention that focuses on changing interactions in the family and has demonstrated efficacy for reducing delinquency and substance use. It has three phases of treatment—engagement/motivation, behavior change, and goal-skills—which last, on average, three months (125). Originally tested through randomized trials of juvenile justice–involved youth, FFT has been associated with reductions in the number of arrests and recidivism when compared with community services or traditional probation (71). Early studies found that 26% of youth in FFT were rearrested, compared with 47%–73% of those receiving other types of treatment or no treatment (1, 71). FFT has also shown some effects for marijuana use among substance-using adolescents (138, 139). Researchers have also linked FFT to reductions in family negativity and blame (125, 126).

The effects of FFT on delinquency have been smaller, albeit still significant when implemented under real-world conditions (52, 53). Therapist adherence is critical for effects to be seen, and when treatment fidelity is low, no significant effects are found (124).

Multisystemic Therapy—Multisystemic Therapy (MST) is designed for youth at risk of out-of-home placement. The MST model focuses intensive intervention to change the youth's ecology: individual, family, peer, school, and marital risk factors. MST is organized by nine principles and lasts ~3–5 months, and therapists are "on call 24/7" (64). MST has a strong research base demonstrating its effects in 18 randomized controlled trials (65). Program effects include long-term reductions in rearrest, severity of crimes committed, reduced risk of out-of-home placement, and improvements in academic outcomes (64, 65). Studies have found intervention effects on delinquency that persist into adulthood: Youth receiving individual therapy were 4 times more likely to be rearrested and nearly 3 times more likely to be arrested for a violent offense than were MST-treated youth up to 14 years after the intervention (119, 120). Some evidence also indicates that MST may have effects on substance use (63, 65). MST has been adapted for families with a history of maltreatment, and participants have shown lower rates of youth mental health problems, parental distress, and placement changes 16 months posttreatment, but investigators did not find program effects on reports of reabuse (134). As with other family programs, MST's effects on antisocial behavior were mediated by improvements in parental management and reduced associations with delinquent peers (61, 65).

MST has also been shown to be effective when implemented in real-world conditions. Independent replications by Ogden et al. (101) and Timmons-Mitchell found significant, albeit smaller, effects (101, 135), although one replication in Sweden showed no program effects among youth with conduct disorders (133). As with FFT, treatment adherence is

essential for outcomes, and low fidelity has been linked to fewer program effects (67, 101, 133).

Multidimensional Family Therapy—Multidimensional Family Therapy (MDFT) is a three-stage program based on the principles of family systems theory (30). MDFT aims to improve parenting skills as well as youth social, coping, and regulation skills, while also addressing issues in the broader family system and youth interactions in other areas such as the peer and school settings (82). Randomized efficacy trials have shown that MDFT is associated with reductions in adolescent substance use, delinquency, and associations with deviant peers and with improvements in classroom behavior and family functioning compared with youth receiving group therapy (85). A comparative effectiveness study found that MDFT and CBT both have significant initial effects on reducing marijuana and alcohol use. However, at 12-month follow-up, youth receiving MDFT were more likely to sustain lower ratings of problem severity and higher rates of abstinence than were youth receiving CBT (83). Some evidence also indicates that MDFT may be more effective than other services for youth who have a higher severity of problems and greater comorbidity (60). Effectiveness trials have also shown program effects. When implemented in community agencies, youth receiving MDFT reported lower substance use, delinquency, and distress than did youth in a group intervention. Furthermore, the program demonstrated significant effects on theorized risk factors, including fewer deviant peer associations, increased positive family interactions, and improved academic outcomes (84).

Brief Strategic Family Therapy—Brief Strategic Family Therapy (BSFT) aims to improve family functioning and strengthen the connections between the family and other systems, such as schools. Similar to FFT and MST, BSFT aims to change family-interaction patterns by using planned, strategic, and problem-focused interventions. Efficacy studies show that youth receiving BSFT had lower posttreatment levels of marijuana use and delinquency and improved parent reports of family functioning than did those in a control group (116, 117). However, results for substance use have been mixed (112). Greater adherence to the program model was associated with improved client outcomes (111). BSFT has not received an independent evaluation and currently would be considered promising (65).

Multidimensional Treatment Foster Care—Multidimensional Treatment Foster Care (MTFC) is an indicated program that delivers intensive services to youth already exhibiting early signs of behavior problems. The program delivers intensive services to youth within trained foster homes. Foster parents are given 20 h of preservice training, are supervised during weekly group meetings and daily phone calls, and have 24/7 access to case-manager consultation. MTFC focuses on providing constant youth supervision and monitoring and rewarding positive behaviors (41).

MTFC has been rigorously evaluated in several randomized controlled trials and has shown significant effects on delinquency, academic outcomes, and teenage pregnancy rates. MTFC appears to be effective for both girls and boys. For girls, MTFC was associated with improvements in school attendance and reductions in delinquency, teenage pregnancy, the number of days in locked settings, and the number of criminal referrals up to two years after

the intervention (22, 81). For boys, MTFC has been associated with lower rates of delinquency, violent offending, and criminal referrals compared with those in group care (40, 41). Effects of MTFC on delinquency have been mediated by improved parent management and reduced association with deviant peers (23, 40, 80). A less intensive version of MTFC known as KEEP (Keeping Foster Parents Trained and Supported) was tested in a randomized trial in San Diego. Youth in the KEEP program demonstrated fewer behavior problems than did those in the control group (23).

Meta-analysis and comparative effectiveness—Family-based programs have been effective as well as cost-effective. A meta-analysis that synthesized 17 different intervention studies including CBT and family therapy programs found that CBT and family programs have significant but modest effects on youth outcomes (average prepost effect was 0.45 for treatment conditions compared with 0.20 for the control group) (139). These effects may be smaller when compared with usual services: A meta-analysis that combined 24 studies on family-based interventions found an average effect size of 0.2 when family-based interventions were compared with usual treatment (7, 139). At present, little evidence shows that any one of these brand-name programs is more effective than others (7, 139). The field clearly needs studies that assess comparative effectiveness.

Court-Based Programs

Numerous program and policy initiatives in the juvenile court system have sought to reduce youth delinquency and reoffending. These include restorative justice, adolescent diversion programs, and changes in adjudication and sentencing (46).

Restorative justice—The goal of restorative justice is to increase the involvement of criminal offenders with the victims of their crime and the greater community. The offender voluntarily meets with the victim to discuss the crime and to determine ways to repair the harm. In spite of growing popularity, there has been little rigorous independent evaluation of restorative justice programs, and little is known about their effects over time. A systematic review concluded that restorative justice is a promising approach for both adults and youth (76). However, restorative justice may reduce rates of recidivism only for more serious juvenile crimes and not for misdemeanors or offenses such as drunk driving (128). It should be noted that most evaluations did not include true randomization, and the program's voluntary nature may introduce selection bias that presents an obstacle to obtaining reliable estimates of program effects because offenders may refuse to participate in the programs (76). Thus, restorative justice may have greater impact on high-risk youth who commit more serious offenses. More research is needed on the long-term impacts of restorative justice on the victims and on reoffending (9).

Adolescent Diversion Program—Other programs, such as the Adolescent Diversion Program (ADP), suggest that contact with the juvenile justice system may increase the risk of future crime. This type of program diverts youth from the justice system and instead provides them with community-based services. Program developers theorize that youth contact with the juvenile justice system may increase the likelihood that youth are negatively labeled, thereby making it more difficult for them to develop prosocial relationships with

peers and other adults. Randomized trials of the ADP suggest that youth in the ADP who are diverted from the justice system and are instead provided with community-based services are less likely to have future contact with the police and courts (129).

Residential treatment programs—A number of systematic reviews have examined the effects of various forms of residential treatment for sentenced youth, including intensive wilderness programs. Although the reviews' assessments of program effectiveness differed —some programs showed positive effects and others showed no effects or negative effects (89)— considerable evidence suggests that greater therapeutic time and higher-quality treatment are associated with stronger positive effects (142). In contrast, boot camps did not show positive effects as compared with effects from traditional detention centers for sentenced youth (141). Thus, one could conclude that rehabilitation-focused programs are more effective than programs relying on sanctions and punishment. The Pathways to Desistance study indicated that neither institutional placement of high-end offenders nor length of sentence were related to recidivism (97). However, youth who received substance abuse treatment for at least 90 days were less likely to reoffend (24).

A fundamental difference between punishment and rehabilitation-focused programs is that rehabilitation-focused programs focus on the process of cognitive change. Programs using some form of CBT that successfully transform the individuals' cognitions about themselves, their past behavior, and their attitudes toward the future appear to increase the odds that youth will avoid potential risky situations in the future as well as take advantage of potential positive opportunities (89).

Cost-Benefit of Interventions

Given that the actions of high-risk youth incur very high costs to society and victims, investigators have conducted substantial research on the potential economic savings of programs. Studies that use cost-benefit analysis explore how programs may offer savings to the criminal justice system, reductions in crime, labor market gains, and increases in the likelihood of high school graduation.

The Washington State Institute for Public Policy has conducted the most extensive analysis of the economic benefits for evidence-based programs (77). A recent report suggests that the cost savings for Aggression Replacement Therapy (ART), Functional Family Therapy (FFT), Multisystemic Therapy (MST), and Multidimensional Treatment Foster Care (MTFC) are substantial. The benefits of these programs range from $31,249 to $70,370 per program participant from savings related to criminal justice, employment, mental health, and crime victim costs. For youth on probation, every dollar spent on FFT leads to a benefit of $10.43, and every dollar spent on ART leads to a benefit of $20.70. The benefit-to-cost ratio for MST is $4.36 and for MTFC is $4.95. These analyses suggest that programs have positive effects not only for youth participants but also for the general taxpayer, as well. We need further economic analysis on other programs that have shown reductions in risky outcomes.

RESEARCH NEEDS AND LIMITATIONS

Type 2 Translational Research

Despite the growing proof that evidence-based programs can reduce the serious and costly problems of high-risk youth, these programs remain underutilized in practice. In contrast, the vast majority of programs used in mental health, child welfare, education, and juvenile justice systems are not evidence based (99, 130). The field of type 2 translational research aims to fill this gap by understanding how factors related to the dissemination, adoption, implementation, and sustainability of evidence-based programs influence their ongoing use in public service systems. This focus includes understanding the necessary organizational and managerial infrastructure as well as how financial factors and policies can influence uptake and sustained use (130).

Interventions are most effective when they are implemented with a high level of treatment fidelity, including adherence to the program model and sufficient dosage (130). In fact, evidence-based programs implemented with low fidelity may have small or no impacts on youth outcomes (8, 62, 63). The importance of fidelity has led program developers to create training and technical assistance programs to aid in the dissemination and implementation of their programs (21, 122, 127). Yet, studies have not identified the cost of the intensive training necessary to reach fidelity as a barrier to adoption (102, 105, 121). Having a local champion and the use of innovative funding strategies (such as third-party payment or coordinated funding provided by multiple sources) have been linked to higher-quality implementation and sustainability of interventions (113, 118). More research is needed to identify the most effective models for intervention financing, training, and technical assistance.

Staff turnover is high in many social service agencies (21), and high turnover can be a barrier to the successful implementation of interventions (54). Some recent studies suggest that the ARC model (availability, responsiveness, and continuity), an organizational intervention designed to identify and address implementation barriers and improve workplace culture and climate, can substantially reduce worker turnover in social service agencies (49). Furthermore, integrating the ARC model with MST has shown particularly strong effects on youth outcomes. In a recent randomized trial of youth referred to the juvenile court system, youth assigned to both MST and ARC had lower problem behavior than did those assigned to just one intervention or to usual services six months after treatment. Eighteen months after treatment, youth receiving both ARC and MST had lower rates of out-of-home placements than did those receiving usual services (50). More research is needed on how to infuse effective interventions into existing service systems.

Productive Efficiency: Identifying Effective Components

To deliver the most effective programs as efficiently as possible, new studies will be needed that focus on productive efficiency. Although productive efficiency can be conceptualized in different ways, here we define it as obtaining maximum possible outcomes from the most economical set of resource inputs (i.e., treatment model). By using comparative-effectiveness designs that examine either different options or delivery strategies of a

particular program, or by contrasting two differing programs, investigators can estimate the differential costs of programs or effects of varying program lengths or intensity using incremental cost-effectiveness ratios (56). However, it will be important to examine the numerous outcomes that might be obtained for high-risk youth and to estimate these ratios over time (at least one to two years after intervention ends) to estimate valid differential cost estimates and savings.

Comorbidity and Differential Effectiveness

Although some research has examined the question of differential effectiveness of interventions for problem behavior by gender, race, or other pretreatment characteristics such as family status, urbanicity, degree, and comorbidity, there is a paucity of research on which factors (moderators) may lead to differential responses to treatment. As these programs further enter public systems and have substantially larger sample sizes, careful research on differential effectiveness for children with different characteristics, needs, and ecological circumstances will be necessary to understand further who derives the most effective benefits from programs and how to modify programs to improve their effectiveness for particular subgroups of youth and their families.

CONCLUSIONS

Adolescent problem behaviors, such as delinquency, substance use, and mental health problems, frequently co-occur, and youth who demonstrate more than one risky behavior face a high probability for difficulties into adulthood. Interventions have been developed to address risk and protective factors at the individual, family, peer, school, and community levels. Family-based and individual cognitive behavioral interventions appear to be the most effective programs for reducing risk. More research is needed to understand the adoption, implementation, and sustainability of evidence-based interventions. In addition, we need to understand better for whom current programs are most effective to create the next generation of more effective and efficient programs.

ACKNOWLEDGMENTS

Work on this paper was supported by research grant F31-DA028047 from the National Institute on Drug Abuse. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute on Drug Abuse or the National Institutes of Health.

ABBREVATIONS

Risk factor	a variable associated with an increased probability of developing a problem
Protective factor	a variable associated with a decreased probability of developing a problem
Comorbidity	the presence of more than one problem behavior or disorder
Chronic antisocial behavior	recurrent aggressive behaviors that lead to injury to others, abuse, or arrest

Age-crime curve	bell-shaped pattern of criminal behavior over time; criminal behavior increases and peaks during adolescence and then declines in young adulthood and beyond
Deviant peer relationships	friendships with youth who engage in behaviors that deviate from societal standards, such as delinquency, illegal substance use, or other antisocial behaviors
Cognitive behavior therapy (CBT)	aims to change behavior by identifying dysfunctional thinking patterns and replacing them with more adaptive thoughts
Universal intervention	prevention program that targets the general population without consideration of individual risk factors
FFT	Functional Family Therapy
Treatment fidelity	extent to which an intervention is delivered with high adherence to the program manual or model
MST	Multisystemic Therapy
BSFT	Brief Strategic Family Therapy
MTFC	Multidimensional Treatment Foster Care
Indicated intervention	prevention program that targets individuals at high risk of developing problem behaviors and who may be demonstrating early signs of developing problems
Cost-benefit analysis	the systematic process for calculating and comparing the benefits and costs of a program
Type 2 translational research	the study of factors that influence the adoption, implementation, and sustainability of evidence-based interventions
Evidence-based program	has demonstrated efficacy or effectiveness through randomized controlled trials
Differential effectiveness	the extent to which a treatment has the same effects on different study populations

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