

CHAPTER 1

The Emerging Science of Drug Abuse Prevention

WILLIAM J. BUKOSKI

INTRODUCTION

Over the past 15 years, prevention science has emerged as a formal biopsychosocial discipline focused upon knowledge development and the application of research findings to the improvement of practice (NIH, 1998). Basic and behavioral scientific studies funded by the National Institutes of Health (NIH) have identified highly promising prevention theories and interventions focused upon a variety of public health problems to include smoking, drug abuse, alcohol abuse, HIV/AIDS, child abuse, physical inactivity and the management of chronic conditions such as asthma, arthritis, and heart disease. However, the continued progress of drug abuse prevention science depends upon future integration with basic neurobiological, genetic, and behavioral research in order to better identify specific underlying biopsychosocial pathways to substance use disorders and to develop scientifically tested and highly efficacious targeted preventive interventions to reduce liability to and the incidence and prevalence of substance use disorders in the general population and in subgroups at heightened risk.

WILLIAM J. BUKOSKI • National Institute on Drug Abuse, National Institutes of Health, Bethesda, Maryland 20892

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LANDMARKS OF DRUG ABUSE PREVENTION SCIENCE

Given over 25 years of etiological and epidemiological research, several appropriate frameworks and models for drug abuse prevention have been identified to include the public health model, the communicable disease model, and the risk and protective factor model (Bukoski, 1991). Common to these models is the tenet that scientific knowledge of the etiology and progression of disease across the life span offers the key to the development of effective prevention interventions.

A landmark study of risk and protective factors research for alcohol and drug abuse in adolescence and early adulthood by Hawkins et al. (1992) firmly established the scientific validity of prevention science. Seventeen clusters of risk and protective factors were identified by these researchers in their review of hundreds of etiologic studies. These included laws and norms, availability, extreme economic deprivation, neighborhood disorganization, physiological factors (biochemical, genetic, and personality traits such as sensation seeking), family drug behavior, family management practices, family conflict, low bonding to family, early and persistent problem behaviors, academic failure, low bonding to school, peer rejection in elementary grades, association with drug-using peers, alienation and rebelliousness, attitudes favorable to drug use, and early onset of drug use.

In addition, this study identified separate and distinct protective factors that mediate or moderate the effects of exposure to multiple risk processes. For example, protective factors for children exposed to stressful life events include a child's positive temperament, supportive family systems, reinforcement of adaptive coping, and inculcation of positive values (Garmezy, 1985). According to emerging research, protective factors may produce an enduring shield or level of resilience against a variety of risk factors that may be reflected in resilient children's display of social problem-solving skills and belief in their own self-efficacy (Rutter, 1985). Recently, Glantz and Johnson (1999) expanded the discussion by exploring the implications for prevention science of current developmental research related to protective factors, resilience, and positive life adaptations.

Hawkins et al. (1992) concluded that theory-based drug and alcohol prevention interventions should have dual goals. The first is to reduce or eliminate the effects of risk exposure. The second is to enhance protective processes and thereby promote the synergism necessary to potentiate the effects of multiple risks.

Additional landmark events have advanced prevention science. For example, in a significant paper titled the "Science of Prevention," Coie et al. (1993) articulated that one of the major goals of prevention research is to test specific theories of risk and protective factors by first specifying the chain of events that then become the targets of the intervention and then to conduct controlled field trials to assess the underlying etiology and efficacy of the preventive intervention to alter the trajectory of risk and the emerging dysfunctional behavior, such as drug abuse. Second, these authors argue for prevention research trials that target those at high risk of the disorder. They recommend that prevention researchers conduct prospective, longitudinal studies to assess the efficacy of prevention interventions to alter the course of developmental psychopathology; that prevention researchers study transactional processes reflected by "person \times environmental interactions"; that prevention research focus upon the powerful role played by cultural beliefs, norms, and behaviors; that prevention research adopt general systems theory by exploring prevention effects resulting from the interactions between multiple developmental influences to include family, school, peer, work place, community, and biology; and that prevention research carefully address the interaction of social influences and biology across the development life course.

Another landmark event for prevention science occurred with the publication of the Institute of Medicine's (IOM) report on "Reducing Risks for Mental Disorders." This systematic review (Mrazek & Haggerty, 1994) revealed that there is a substantial knowledge base of biological and psychosocial risk and protective factors associated with a variety of serious health problems to include Alzheimer's disease, schizophrenia, alcohol abuse and dependence, depressive disorders, and conduct disorders. In addition, the report identified a number of well-controlled prevention intervention research trials that demonstrated the scientific efficacy of prevention to reduce the risks for a variety of health problems related to physical health, parenting and family functioning, family preservation, prenatal and infant care, enhancing child development, promoting social competence, academic achievement, school reorganization, substance abuse, conduct disorder, social environments, violence prevention, marital relationships, challenges to childbearing and childrearing, occupational stress and job loss, depressive disorders associated with poverty and minority status, stress on family care providers of the chronically ill, coping with widowhood and bereavement, and co-morbidity of multiple disorders.

Mrazek and Haggerty also advanced the conceptual basis of prevention by their introduction of the mental health spectrum. According to these authors, the medical prevention model (primary, secondary, and tertiary prevention) was best suited to medical disorders and was not well suited to mental health problems. For example, they suggested that it is very difficult to establish a "case" of mental disorder as is done with medical disorders. There is disagreement as to what constitutes a case of mental disorder, in that symptoms may exist even though a disorder does not meet all conditions of DSM-III-R. Finally, the mental disorders of children (birth to age of 5) are difficult to diagnose as a psychiatric case because the problems relate more to impairment in psychosocial development or cognitive functioning.

As a result, the authors proposed an alternative to the medical model and called that model "the mental health intervention spectrum." Under this model, the term "prevention" includes three levels of intervention: "universal, selective, and indicated." Prevention interventions are implemented prior to the initial onset of a diagnosed disorder. Once the diagnostic threshold is reached by satisfying the requirements of a nosology such as DSM-III-R or DSM-IV, then "treatment" programs are appropriate. These would include case identification and standard treatment for known disorders. The final level is "maintenance," which includes interventions that assist with compliance to treatment regimens and to the reduction of relapse and recurrence of the disorder and after care to include rehabilitation.

An important feature of this model is the recommendation that ALL three levels of prevention interventions should be implemented in a practice setting. Mrazek and Haggerty acknowledge that "universal preventive interventions" should be targeted to the general population, e.g., prenatal care, childhood immunizations. Subgroups of the population that present greater than normal biological, psychological, or social risk associated with developing a disorder would also receive an appropriate "selective preventive intervention." Examples would include home visitation for low-birth-weight babies, preschool for disadvantaged children, and support groups for elderly widows. Finally, an "indicated preventive intervention" would be implemented for those with detectable signs or symptoms of developing the disorder. One example is parent-child interaction training for families with a child presenting behavioral problems, but whose behaviors are not sufficiently severe to warrant a clinical diagnosis.

This publication coalesced the scientific importance of the risk and protective factor model for prevention, demonstrated that prevention science had already designed and tested a number of theory-based interventions that demonstrated their efficacy to reduce the risk of a variety of mental disorders, and highlighted the importance of assessing a series of preventive interventions

along a program continuum from universal through selective to indicated in order to address the range of early biological and behavioral indications of increased vulnerability to the subsequent emergence of the disorder at a clinically diagnosable level.

This IOM report increased the importance in prevention science of developing a series of “targeted interventions” that best address the biopsychosocial risk profiles of individuals at a specific developmental stage, thereby increasing the chances of producing positive and enduring preventive effects over time. The report also reinforced the importance of studying both proximal and distal variables. In the language of prevention, proximal variables are hypothesized to mediate the effects of the “distal” outcomes targeted by the intervention (Buchner and Cain, 1998).

Another landmark event in prevention science was the release of NIDA’s publication titled “Preventing Drug Use Among Children and Adolescents: A Research-Based Guide (1997). This publication clearly established the beginning of the evidence-based drug abuse prevention movement that has emerged across the country over the past 5 years.

Based upon numerous well-designed, randomized controlled trials of theory-based drug abuse prevention interventions in schools, with families, in the workplace, and in the community, NIDA’s research led to the formulation of clearly stated evidence-based drug abuse prevention principles that could be applied at the community level.

These principles articulate in practical terms the cumulative research evidence that supports the premise that adolescent drug abuse can be prevented by the implementation of tested prevention programs and policies that target the reduction or amelioration of individual, family, peer, school, and community risk factors, and that enhance protective factors and processes salient to adolescent drug abuse onset and progression.

Even though this publication has been widely disseminated to the prevention practice and research communities, a restatement of these seminal drug abuse prevention principles is warranted.

- “Prevention programs should be designed to enhance ‘protective factors’ and move toward reversing or reducing known ‘risk factors.’”
- Prevention programs should target all forms of drug abuse, including the use of tobacco, alcohol, marijuana, and inhalants.
- Prevention programs should include skills to resist drugs when offered, strengthen personal commitments against drug use, and increase social competency (e.g., in communications, peer relationships, self-efficacy, and assertiveness), in conjunction with reinforcement of attitudes against drug use.
- Prevention programs for adolescents should include interactive methods, such as peer discussion groups, rather than didactic teaching techniques alone.
- Prevention programs should include a parents’ or caregivers’ component that reinforces what the children are learning—such as facts about drugs and their harmful effects—and that opens opportunities for family discussions about the use of legal and illegal substances and family policies about their use.
- Prevention programs should be long term, over the school career with repeat interventions to reinforce the original prevention goals. For example, school-based efforts directed at elementary and middle school students should include booster sessions to help with critical transitions from middle to high school.
- Family-focused prevention efforts have a greater impact than strategies that focus on parents only or children only.
- Community programs that include media campaigns and policy changes, such as new regulations that restrict access to alcohol, tobacco, or other drugs, are more effective when school and family interventions accompany them.

- Community programs need to strengthen norms against drug use in all drug abuse prevention settings, including the family, the school, and the community.
- Schools offer opportunities to reach all populations and also serve as important settings for specific subpopulations at risk for drug abuse, such as children with behavior problems or learning disabilities and those who are potential dropouts.
- Prevention programming should be adapted to address the specific nature of the drug abuse problem in the local community.
- The higher the level of risk of the target population, the more intensive the prevention effort must be and the earlier it must begin.
- Prevention programs should be age specific, developmentally appropriate, and culturally sensitive.
- Effective prevention programs are cost-effective. For every dollar spent on drug use prevention, communities can save 4 to 5 dollars in costs for drug abuse treatment and counseling.”

Since the publication of NIDA’s drug abuse prevention principles, numerous Federal agencies have launched special programs to identify and disseminate evidence-based drug abuse prevention programs and policies that have been thoroughly tested and shown to be efficacious. Frequently, these federal efforts expanded the search of evidence-based prevention programs beyond substance abuse to those targeting youth violence and juvenile delinquency.

For example, the U.S. Department of Education has developed an expert panel process to identify exemplary and promising drug prevention programs that could be used as part of their Safe and Drug-Free Schools national program (http://www.ed.gov/offices/OESE/SDFS/model_programs.html).

To receive an exemplary rating, a prevention program must have at least one study demonstrating its efficacy to prevent substance abuse, school violence, or other conduct problems, and to receive a strong or adequate rating on the evaluation criteria established by the committee. A promising program also would have had at least one efficacy study demonstrating positive outcomes or an efficacy study that indicated a positive program effect on one or more risk or protective factor. A promising program would have received a minimally acceptable or adequate rating on the evaluation criteria used by the committee.

As a result of this extensive review process, the Department of Education identified nine exemplary programs with advanced research evidence to support their claim, e.g., Athletes Training and Learning To Avoid Steroids (ATLAS), Life Skills Training, Project TNT (Towards No Tobacco Use), The National Center on Addiction and Substance Abuse at Columbia University’s Striving Together to Achieve Rewarding Tomorrows (CASASTART), OSLC Treatment Foster Care, Project Alert, Project Northland, Second Step: A Violence Prevention Curriculum, and the Strengthening Families Program: For Parents and Youth 10–14. On their list are also 33 promising programs that have good scientific evidence to support their claims of efficacy, e.g., All Stars, Child Development Project, Lion’s-Quest Skills for Adolescence, Preparing for the Drug-Free Years, Project STAR, etc. Further information on review criteria and program descriptions are available at the previously cited home page.

The Center for Substance Abuse Prevention (CSAP), Substance Abuse and Mental Health Services Administration (SAMSHA) established a “National Registry of Effective Prevention Programs.” In this system, reviewers rate program research on 15 criteria to include theory, outcomes, measures, data analysis, and program integrity (<http://www.samhsa.gov/centers/csap/modelprograms/programs.cfm>).

CSAP has identified 44 model programs as of April 11, 2002, and includes drug abuse prevention programs such as All-Stars, Athletes Training and Learning To Avoid Steroids (ATLAS), Brief



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