

The term “evidence-based programs” is becoming quite common in prevention and human service work. However, many still struggle to recognize the importance of evidence-based programs and to understand what qualifies as “evidence-based”. The language used may even seem to confound the issue further. The terms evidence-based, research-based, science-based, blueprint programs, model programs, promising programs, and effective programs are often used interchangeably. Different agencies and groups have adopted different criteria to determine whether or not a program is evidence-based. In this fact sheet, we examine definitions of, and standards and reasons, for using evidence-based programs.

The genesis of evidence-based programs

As the field of prevention science evolved over the last two decades, early attention was paid first to developing preventive interventions that were grounded in a sound underlying theory of the causes and solutions to poor outcomes and problem behaviors (such as substance abuse or youth violence), and later to demonstrating the effectiveness of these interventions through well-designed evaluation studies. As more programs were evaluated in rigorous studies (randomized controlled trials or quasi-experimental studies), a body of evidence accumulated to allow the identification of “effective programs”. As that body of evidence grew, policy makers and funding sources began to encourage, and eventually to require, the use of these tested programs. This led the sponsoring agencies to develop criteria for application to evidence of effectiveness and to publish lists of programs that met these criteria.

Standards for evidence-based programs

A number of agencies and organizations have now identified standards to determine a program’s effectiveness. The University of Colorado’s Center for the Study and Prevention of Violence (CSPV) was one of the first groups to apply specific criteria in determining effectiveness. The programs identified by the CSPV, called Blueprints for Violence Prevention, are now divided into Model and Promising programs based on ratings of (1) strong research design, (2) evidence of significant prevention or deterrent effects, (3) multiple site replication, and (4) sustained effects.



The Center for Substance Abuse Prevention (CSAP), via its National Registry of Effective Prevention Programs (NREPP), uses 15 criteria to distinguish effective programs from promising programs. Programs are divided into three categories: Model, Promising, and Effective. Some of the criteria include: underlying theory, intervention fidelity, process evaluation, sampling strategy and implementation, and outcome measures.

The U.S. Department of Education divides its programs into Exemplary and Promising using seven criteria, including: (1) relevant evidence of efficacy/effectiveness based on methodologically sound evaluation, (2) program goals with respect to changing behavior and/or risk and protective factors, which are clear and appropriate for the intended population, and (3) a clearly stated rationale underlying the program, and alignment of the program’s content and processes with its goals.

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The Substance Abuse and Mental Health Services Administration (SAMSHA) uses the term “science-based programs”, which it defines as “programs which have been reviewed by experts in the field according to accepted standards of empirical research. Science-based programs are conceptually sound and internally consistent, have sound research methodology, and can prove that effects are clearly linked to the program itself and not to extraneous events” (SAMSHA, 2005).

The No Child Left Behind Act (2001) requires the use of science-based programs. In this case scientifically based research is defined as “research that involves the application of rigorous, systematic, and objective procedures to obtain reliable and valid knowledge relevant to education activities and programs. This research includes systematic, empirical methods; rigorous data analyses; relies on measurements or observational methods; is evaluated using experimental or quasi-experimental designs; allows for replication; and accepted by peer-reviewed journal(s) or by a panel of independent sources.”

“For a program to be considered evidence-based, it must have been tested in a well-designed and methodologically sound study, and have been shown to produce significant reductions in poor outcomes or associated risk factors.”

In April 2004, the Society for Prevention Research (SPR) adopted a set of standards “to be used by diverse organizations seeking to identify tested and effective prevention programs worthy of replication, adoption, or dissemination...the widespread use of these criteria will lead to consistent and high standards for determining whether programs have been scientifically shown to be efficacious, effective or ready for dissemination” (Society for Prevention Research, 2004).

This list of organizations and definitions shows that “evidence-based” has been interpreted differently by different groups and has been called by different names. Most of these definitions, however, share a common set of core characteristics that make up the de-facto determination of “evidence-based programs”. For a program to be considered evidence-based, it must have been tested in a well-designed and methodologically sound study, and have been shown to produce significant reductions in poor outcomes or associated risk factors.

Randomized Controlled Trials

Although a number of research designs can be used to determine the effectiveness of a prevention program, the randomized controlled trial (RCT) is widely considered the most scientifically rigorous. In a RCT, a target population is divided and randomly assigned to either receive the preventive intervention or to be assigned to a “no-treatment” comparison condition or to an alternative intervention. The combined use of both random assignment and a comparison group is intended to control for selection bias as well as extraneous variables that may cause post-intervention differences. A less rigorous alternative is the quasi-experimental study, in which the assignment to intervention or comparison conditions is not random. Because analytic methods allow researchers to adjust for pre-test differences in the intervention and comparison conditions, the quasi-experimental study is still considered a fairly rigorous form of evaluation.

Further, the body of research demonstrating evidence of effectiveness must have undergone review by experts in the field in order to identify possible methodological flaws in the research or statistical analyses. This is usually, though not exclusively, accomplished through publication of the findings in a peer-reviewed scientific journal. Programs that meet these criteria can be assumed to have a strong theoretical foundation (making them research-based or science-based). Thus all evidence-based programs can be considered research- or science-based, but not all research-based programs have demonstrated evidence of effectiveness. The criteria of these different groups vary in terms of their level of evidence. The SAMSHA criteria require evidence from one well-designed study (either RCT or quasi-experimental). The CSPV Blueprints criteria require a RCT plus replication of that study’s findings in an additional study. The Society of Prevention Research requires multiple RCTs with at least one study conducted by an independent investigator not involved in the development of the intervention. Each set of criteria therefore represents a different point along a continuum of evidence and scientific rigor. Even when programs are considered evidence-based, additional characteristics should be considered in the decision to adopt a program. These include the capacity of the program for replication (i.e., is there an infrastructure in place to support training and ongoing technical assistance?); the practicality or cost-effectiveness of the program (do the benefits of the program warrant the investment of resources?); the relevance of the program to the target population; and the likelihood that the program’s benefits will be sustained over time. In some cases, these criteria have been included in an agency’s determination of “evidence-based”.

Why do we need evidence-based programs?

Federal and state sponsoring agencies are demanding accountability from programs and understandably wish to see results from the investment of state and federal prevention dollars. For example, one of the largest sources of federal substance abuse prevention funding, the Office of Safe and Drug-Free Schools, requires school districts to adhere to 'Principles of Effectiveness' by choosing from a list of approved programs.

Beyond the practical issue that evidence-based programs are more commonly being required by sponsoring agencies, professional and fiscal responsibility dictate the use of these programs whenever possible. In times of shrinking budgets and increasing federal and state deficits, policy makers and practitioners must make efficient use of prevention resources by opting for programs that have the greatest likelihood of producing positive effects. Because evidence-based programs have been rigorously tested, we can be confident that if they are implemented with fidelity, they will be effective. Evidence-based programs consistently demonstrate positive outcomes and are reliable over time (SAMSHA, 2002). Further, research has shown that even well-intentioned, theoretically sound, and often very popular prevention programs sometimes show no positive effects, and in some cases actually increase poor outcomes (Ennet, Tobler, Ringwalt & Flewelling, 1994). Given the possibility that prevention programs might actually exacerbate poor outcomes for children and families, there is a responsibility to utilize strategies that have been thoroughly tested and are proven to work.

Although the empirical support for prevention programs continues to grow, more research is needed to continue to strengthen the evidence and impact of preventive interventions. First, there is a need to add qualitative research

to understand how, why and for whom these programs are effective. Second, there is a need for further replications of many of these programs, as well as replications with different ethnic and cultural populations. Finally, there are still a variety of outcome areas for which there are few or no evidence-based programs (for example, the prevention of anxiety disorders or maladjustment due to exposure to violence). Policy makers and practitioners should continue supporting efforts to strengthen the research base for empirically supported prevention programs as well as continuing to advocate for their use.

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Resources on Evidence-based Programs

- Substance Abuse and Mental Health Services Administration (SAMHSA) National Registry of Effective Prevention Programs (NREPP) <http://www.modelprograms.samhsa.gov/>
- Centers for Disease Control Effective Programs <http://www.cdc.gov/HealthyYouth/partners/registries.htm>
- Society for Prevention Research www.preventionscience.org or www.preventionresearch.org
- University of Colorado Blueprints for Violence Prevention <http://www.colorado.edu/cspv/blueprints/>
- U.S. Department of Education List of Exemplary & Promising Prevention Programs www.ed.gov/offices/OERI/sdfs

Effectiveness vs. Efficacy

Although evidence-based programs are considered in common parlance to have demonstrated “effectiveness,” the scientific community further delineates programs as being efficacious or effective. In research terms, programs that have been evaluated in a study in which the researcher artificially controls the study environment are said to have demonstrated efficacy. An efficacious program has demonstrated that it can produce positive outcomes when all conditions are right. Generally, once a program has demonstrated efficacy, it is then evaluated in more naturally occurring, “real-world” conditions. Although evidence-based programs have demonstrated positive outcomes in a controlled study, not all have demonstrated true “effectiveness” by being evaluated in more natural conditions. This is another facet of evidence that should be considered when selecting a preventive intervention.

The mission of the Prevention Research Center for the Promotion of Human Development is to promote the well-being of children and youth and to reduce the prevalence of high-risk behaviors and poor outcomes in children, families and communities. The Center examines how communities can work together with families, schools, community groups, and industry to promote healthy lifestyles for children, youth, and families, and develops clinical trials of innovative models to promote competence and prevent maladaptive outcomes for children. Researchers at the Center design and implement program evaluations and research studies. The Center also provides technical assistance in evidence-based programs and interventions. To learn more about the Penn State Prevention Research Center please visit our website at www.prevention.psu.edu.

This fact sheet was prepared by Sandee J. Kyler, Brian K. Bumbarger, and Mark T. Greenberg at the Prevention Research Center, The Pennsylvania State University. Please address correspondence to Brian K. Bumbarger, S109 Henderson Building, University Park, PA 16802-6500. Phone: (814) 865-2617 Email: bkb10@psu.edu

This Fact Sheet is produced by the Penn State Prevention Research Center under grant # 2004-PC-ST-14568 from the Pennsylvania Commission on Crime and Delinquency. The opinions, findings, conclusions, and recommendations expressed in this document are those of the authors alone and do not necessarily reflect the opinions of the Pennsylvania Commission on Crime and Delinquency.

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U.Ed. HHD 05-100

Prevention Research Center for the Promotion of Human Development
College of Health and Human Development
The Pennsylvania State University
109 South Henderson Building
University Park, PA 16802-6504

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