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TECHNICAL REPORT

Interventions to Improve Student Mental Health

A Literature Review to Guide Evaluation of California's Mental Health Prevention and Early Intervention Initiative

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Sponsored by the California Mental Health Services Authority



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The research described in this report was prepared for the California Mental Health Services Authority and was conducted within RAND Health, a division of the RAND Corporation.

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Preface

This review is one of a series of three literature reviews conducted by RAND to inform its evaluation of the California Mental Health Services Authority (CalMHSA) Prevention and Early Intervention (PEI) initiatives. CalMHSA is an organization of county governments working to improve mental health outcomes for individuals, families and communities. Prevention and Early Intervention programs implemented by CalMHSA are funded through the voter-approved Mental Health Services Act (Prop. 63). Prop. 63 provides the funding and framework to expand mental health services to previously underserved populations and all of California's diverse communities.

CalMHSA's PEI initiatives fall into three related areas: stigma and discrimination reduction, suicide prevention, and student mental health, with several programs within each initiative area. RAND is charged with conducting evaluations at the program, initiative, and statewide levels. We reviewed the evaluation literature in each PEI initiative area to understand the state of the art in each area, including relevant theories of change, what is and is not known about PEI program effectiveness, and what kinds of methodologies have been previously used in evaluations of PEI programs. These are not comprehensive reviews of the broader literatures addressing the topics of mental health stigma, suicide, and student mental health.

The information contained in this report should be of interest to a wide range of stakeholders both within and outside the state of California, from organizations and counties implementing PEI programs, to policymakers making key funding decisions in this area. It will help stakeholders understand the evidence base for preventive interventions, including what kinds of programs have empirical support, and the areas where further evaluation is needed.

This document was prepared with the input of stakeholders across the state of California. In particular, members of the Statewide Evaluation Experts (SEE) Team provided input to guide the development of the document and feedback on a draft of the report. The SEE is a diverse group of CalMHSA partners and community members, including CalMHSA board members, representatives of counties of varied sizes, representatives of the California Mental Health Directors Association, a representative from the California Institute for Mental Health, members of the Mental Health Services Oversight and Accountability Commission, a representative from the California State Department of Mental Health, individuals with expertise in cultural/diversity issues, behavioral scientists with evaluation expertise, and consumers and family members who have received mental health services.

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Summary

Mental health problems are common among children and adolescents; approximately 25 percent of children experience a mental health disorder annually, and 40 percent of adolescents meet lifetime diagnostic criteria for multiple mental health disorders (Merikangas et al., 2010a; Merikangas et al., 2010b; Kessler et al., 2005). Mental health disorders can greatly affect children and adolescents' functioning in multiple domains, including at school, in the home, with friends, and in communities (Kovacs and Goldston, 1991; Renouf, Kovacs and Mukerji, 1997; Asarnow et al., 2005; Jaycox et al., 2009).

Given the high prevalence of mental health disorders among children and adolescents, schools have developed programs to meet students' mental health needs. These student mental health (SMH) programs can range from universal to highly targeted. Universal programs are designed to increase awareness of and sensitivity to mental health issues in students—for example, by supporting students coping with stress and encouraging student help-seeking behaviors. The more-targeted programs are designed to provide staff or faculty skills to identify and respond to specific mental health issues or populations (e.g., suicide prevention, substance use). Evaluating the diverse array of SMH programs is critical to improving their effectiveness.

In this document, we provide an overview of selected scientific literature related to the evaluation of SMH programs. This review was conducted to inform RAND's evaluation of the California Mental Health Services Authority (CalMHSA) Prevention and Early Intervention (PEI) initiatives. CalMHSA is an organization of county governments working to improve mental health outcomes in the state of California. SMH is one of three key initiative areas, and we focused our review on research that is most relevant to the CalMHSA evaluation.

First, we review data on the prevalence of youth mental health disorders, as well as on the use of mental health services provided by schools and campuses. In addition, we describe the role of schools in addressing student mental health concerns. We outline a conceptual model for guiding the evaluation of SMH programs. We also touch on issues related to the evaluation of cross-system collaborations that can influence students' access to resources and services. Finally, we review some of the challenges associated with evaluating SMH programs.

The literature on evaluating SMH programs suggests that such programs can be effective. Evaluations examining short-term changes in knowledge, skills, and attitudes resulting from SMH programs have consistently shown that such programs can improve staff, faculty, and student knowledge of mental illness; skills for identifying and referring students with symptoms; and attitudes toward mental illness (Kelly et al., 2011; Rodgers, 2010; Reis and Cornell, 2008; Ward, Hunter and Power, 1997; Wyman et al., 2008). A number of studies show that SMH programs can result in intermediate positive changes in staff, faculty, and student behaviors (e.g., Horner, Sugai and Todd, 2005; Sumi, Woodbridge and Javitz, 2012). Evaluation of the long-term effects (e.g., student mental health service utilization, improved student mental health, lower dropout rates) of SMH programs on mental health are less common, but the programs that do show effects (e.g., Botvin et al., 1995; Botvin et al., 2001; Ellickson et al., 2003; Greenberg

et al., 1995; Horner, Sugai and Todd, 2005) are commonly more comprehensive and intensive, of longer duration, are well structured, and attend to key components of implementation.

In addition to reviewing design and measurement issues related to evaluating SMH programs, we also highlight the continuing need for research exploring a full range of outcomes of SMH programs. Although evaluations may often consider structure, process, and short-term outcomes (e.g., knowledge, attitudes, skills), often these are not linked to intermediate student outcomes, such as increased student help-seeking or increases in student referral for mental health services, or long-term student outcomes, such as decreased mental health symptoms. Linking these different outcomes would provide a more comprehensive understanding of the effects of SMH programs.

Acknowledgments

The RAND Health Quality Assurance process employs peer reviewers, including at least one reviewer who is external to the RAND Corporation. This study benefited from the rigorous technical reviews of Sharon Hoover Stephan and Joshua Breslau, which served to improve the quality of this report.

Abbreviations

AOD	alcohol and other drug
ASIST	Applied Suicide Intervention Skills Training
BASICS	Brief Alcohol and Screening Intervention for College Students
CalMHSA	California Mental Health Services Authority
C/U	college/university
ES	elementary school
GPA	grade point average
HS	high school
IY TCM	Incredible Years Teacher Classroom Management
MS	middle school
OBPP	Olweus Bullying Prevention Program
OMH	overall mental health
P	peer-to-peer
PBIS	Positive Behavioral Interventions and Supports
PEI	Prevention and Early Intervention
QPR	Question, Persuade, Refer
RA	resident assistant
RCT	Randomized Controlled Trial
RiPP	Responding in Peaceful and Positive Ways
RTI	Response to Intervention
SMH	student mental health
SOS	Signs of Suicide Program
SP	Suicide prevention
T	Training
TKSS	Teacher Knowledge and Skills Survey
YSPP	Youth Suicide Prevention Program

Introduction

An estimated 25 percent of children experience a mental health (MH) disorder annually (Merikangas et al., 2010a; Merikangas et al., 2010b; Kessler et al., 2005). Forty percent of adolescents meet lifetime criteria for multiple disorders, with age of onset in childhood or early adolescence. These conditions have wide-ranging effects. Mental health disorders can affect students' functioning in school, at home, with their friends, and in their communities (Kovacs and Goldston, 1991; Renouf, Kovacs and Mukerji, 1997; Asarnow et al., 2005; Jaycox et al., 2009), which in turn may interfere with students' successfully attaining key developmental milestones (Kovacs and Goldston, 1991).

Schools have long played a central role in addressing the emotional and behavioral needs of K–12 students. Schools are the setting in which many early mental health problems are first identified. Educational settings offer greater access to services than referrals and ongoing treatment in specialty treatment settings (Jaycox et al., 2010). As a result, student mental health (SMH) programs are increasing in popularity in the United States (Foster, United States Department of Health and Human Services and Center for Mental Health Services (U.S.), 2005) and in other countries (Rowling and Weist, 2004).

In our review of the literature, we find that there has been a substantial growth in the use of SMH programs and services, in both K–12 schools and among colleges and universities. This review was conducted to inform RAND's evaluation of the California Mental Health Services Authority (CalMHSA) Prevention and Early Intervention (PEI) initiatives. CalMHSA is an organization of county governments working to improve mental health outcomes, and SMH is one of its three key initiative areas. These initiatives include universal programs for all students, and targeted programs, such as those being conducted by the CalMHSA SMH initiative Program Partners, programs that focus on students or groups of students at higher risk for mental health problems, and intensive treatment programs for students with mental health problems.

As described below, evaluations of SMH programs assess a wide range of outcomes (see Durlak et al., 2011; Center for Health and Health Care in Schools, School of Public Health and Health Services; and The George Washington University, 2001–2011). These include structure and process outcomes, such as the development of SMH sensitive curriculums and faculty participation in SMH program training; short-term outcomes, such as changes in staff and faculty knowledge and attitudes about mental health disorders; intermediate changes in reported or observed behavior among students, such as increased help-seeking behavior or improved stress management; changes in faculty members referral of distressed students; and changes in the school environment. Changes in short-term outcomes, such as knowledge and attitudes, are relatively easy to assess, often through pre-post training surveys, and are often evident within a brief period of time. Although it is expected that changes in the knowledge, skills, and attitudes of staff delivering SMH programs would temporally precede changes in intermediate outcomes, such as improved coping or help-seeking behavior, relatively few evaluations have demonstrated that changes in short-term outcomes are linked to changes in intermediate student outcomes.

Evaluations of the effect of SMH programs on student outcomes have also examined a range of long-term outcomes including both mental health (e.g., suicide attempts, depression, substance

use) and academic (e.g., dropout rates) outcomes. However, these types of evaluations are less common because of both data collection and methodological challenges. Demonstrating significant change in student mental health outcomes as a result of the implementation of SMH programs is somewhat challenging to capture in a typical evaluation study, as changes in student mental health outcomes in response to school-level initiatives often require months, if not years, to emerge. Moreover, methods to increase the validity and reliability of measuring student mental health outcomes pose additional challenges, as data collection must move beyond collecting basic self-report surveys from students and identify (and collect data from) a comparison population that has not been exposed to the intervention. For these reasons, evaluations of long-term student mental health outcomes are time- and resource-intensive. Evaluations of structured programs in which one expects change in a clearly defined set of behaviors, such as increased student engagement in mental health services or decreased dropout rates, are best suited to demonstrate change in long-term outcomes.

This report provides an overview of the epidemiology and scientific literature related to the evaluation of SMH programs. The discussion is divided into three sections. The first provides an overview of the prevalence of youth mental health disorders and use of school and campus mental health services and describes the role of schools in addressing student mental health concerns. Additionally, we outline our logic model that serves as the framework of the review of the effects and evaluation of SMH programs. The second section outlines our review of the evaluation efforts in the student mental health literature. Because of the breadth of SMH initiatives, we focus on exemplars of evaluation efforts or prevention programs most relevant to the CalMHSA Prevention and Early Intervention (PEI) SMH initiative funded programs (see the appendix for a summary of key evaluations of SMH programs). In the third section, we conclude by summarizing some of the challenges in evaluating SMH programs.

Student Mental Health Problems and the Role of School-Based Services

Prevalence of Mental Health Problems Among Youth

In recent years, mental health disorders among children have received increased publicity, especially after the Surgeon General's warning that "the nation is facing a public crisis in mental healthcare for infants, children and adolescents" (U.S. Public Health Service, 2000). Among adolescents experiencing a mental health disorder, anxiety is the most common lifetime condition (32 percent), followed by behavior disorders (19 percent), mood disorders (14 percent), and substance use disorders (11 percent); approximately 40 percent of adolescents meet lifetime criteria for multiple disorders. Age of onset of all classes of disorder often occur in childhood (e.g., 6 years old for anxiety disorder) or early to mid-adolescence (e.g., 11 years old for behavior, 13 years old for mood, and 15 years old for substance use disorders) (Merikangas et al., 2010b). However, the prevalence of alcohol and other drug (AOD) use, which often occurs along with mental health problems, increases substantially among youth in the United States during the middle school and high school years (Donovan, 2007; Johnston et al., 2009), with alcohol and marijuana use tripling from 6th to 8th grade (D'Amico et al., 2005).

The Role of Schools and Campuses in Student Mental Health

Schools play a key role in providing mental health services to youth. Primary and secondary school-age students are more likely to receive mental health services in school than in any other setting (Burns et al., 1995; Jaycox et al., 2010). School and campus mental health services, staff, and faculty are uniquely positioned to identify students at risk for mental health problems and to help intervene when problems arise. They are well positioned to serve as an initial point of contact for many student mental health interventions by being in a position to educate students, knowing when to identify at-risk behaviors, and referring students for mental health services.

In addition to staff-led programs, peer-to-peer SMH programs have gained popularity, particularly within higher education systems, because peer educators and counselors offer additional reach to students and have been shown to be as effective as professionals at delivering some student mental health services (Ender and Newton, 2000; Mastroleo et al., 2008). Moreover, peer counselors may be able to connect and communicate with other students in ways that faculty, staff, and administrators cannot (i.e., similar life stages, common language, and understanding the social environment). In recent years, a few schools and campuses have also capitalized on the boom in social media and Internet use, allowing them to increase access to mental health resources for both students in need and for the general school population through these media, although we are unaware of any empirical evaluations of the effects of these efforts.

Assessments of SMH services and programs in schools and on campuses show a variety of positive effects, including improved access to care (Burns et al., 1995; Catron, Vicki and Weiss, 1998; Rones and Hoagwood, 2000), enhanced preventive services (Elias, Gager and Leon, 1997), increased early problem identification (Weist et al., 1999), and decreased stigma and provision of services in a more natural setting (Atkins et al., 2001; Nabors and Reynolds, 2000). However, despite their growth in recent years (Brener, Martindale and Weist, 2001; National Center for Chronic Disease Prevention and Health Promotion, 1995; National Center for Chronic Disease Prevention and Health Promotion, 2001; National Center for Chronic Disease Prevention and Health Promotion, 2007), SMH programs and interventions in K–12 schools remain unavailable to many students who could benefit from them. Studies estimate that approximately 50–80 percent of children with mental health problems have an unmet need for mental health care (Merikangas et al., 2010a; Kataoka, Zhang and Wells, 2002).

In the last decade, colleges and universities have also been playing an increasingly important role in addressing the mental health needs of youth, with a substantial increase in the number of students seeking help for serious mental health problems, such as depression and anxiety, at college and university campus counseling centers. The 2011 National Survey of Counseling Center Directors found that 37 percent of counseling center clients in colleges and universities had significant mental health problems, such as depression, anxiety, suicidal ideation, alcohol abuse, and eating disorders—a sharp increase from 16 percent in 2000 (Gallagher, 2010).

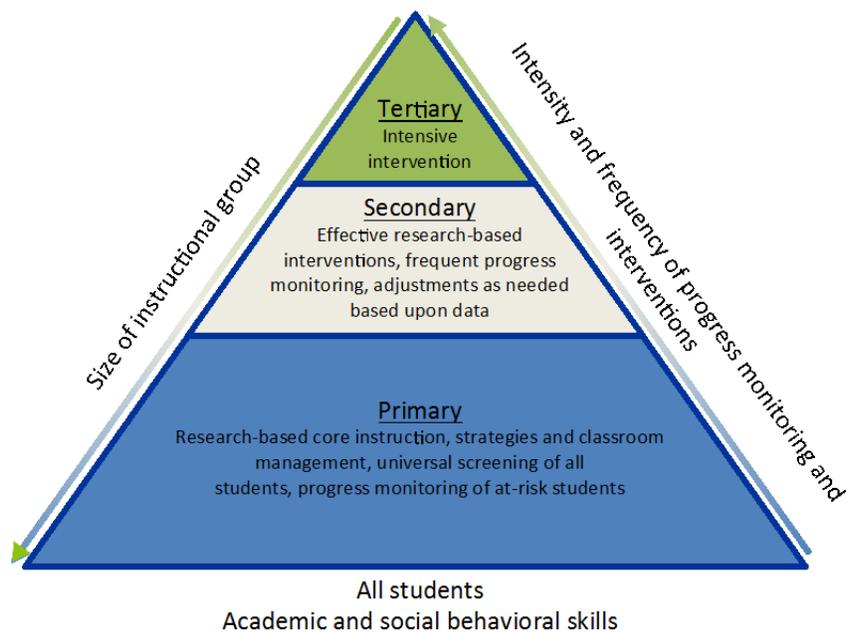
In addition to the SMH programs, many school systems have also focused efforts on developing and enhancing collaborations across the different school systems, as well as with community-based mental health programs, with the goal of improving access to care for students. Often, K–12 schools, colleges, and universities lack the resources to address the needs of students requiring more intensive services. Therefore, SMH initiatives seek out these services

and resources through partnerships and collaborations. These collaborative efforts improve system coordination, but they also feed into the student outcomes that are outputs of the campus student mental health efforts.

Types of Student Mental Health Programs

Many SMH programs focus on specific mental health problems, such as student behavioral problems, suicide prevention, or commonly comorbid substance use problems; others seek to influence the general school climate or culture surrounding attitudes and support of students with mental health problems. To characterize the types of programs, we turn to the Response to Intervention (RTI) framework, widely used in recent years by K–12 educators to categorize academic intervention efforts and increasingly used to categorize SMH programs (see Figure 1). The RTI framework includes Tier 1 universal school-wide primary prevention programs, Tier 2 secondary prevention programs targeting at-risk populations, and more intensive Tier 3 tertiary programs for students with the greatest needs and existing mental health problems (Fox et al., 2003; Fox et al., 2009).

Figure 1. The RTI Pyramid



The framework highlights how a continuum of services can be provided to students, depending on the level of risk involved. Tier 1 or primary prevention programs are designed to increase awareness of and sensitivity to mental health issues in students—for example, by supporting students coping with stress and encouraging student help-seeking behaviors. For example, if addressing the issue of suicide prevention among college students, a Tier 1 program might educate all students about the warning signs of suicidal intentions and increase awareness

of resources from where they can receive more information and support or refer others. Tier 2 or secondary prevention programs target subgroups of students identified as at-risk for mental health disorders but not yet exhibiting symptoms. These programs are often designed to provide staff or faculty skills to identify and respond to specific mental health issues or populations (e.g., suicide prevention, substance use). For instance, a Tier 2 program aimed at preventing suicide might be offered to students at greater risk for depression and suicide, such as those students experiencing school failure. Tier 3 or tertiary programs are designed to identify students who are experiencing early signs of mental health disorders and target them with special programs designed to treat symptoms. For example, a Tier 3 program might target students demonstrating depression, anxiety, or other serious mental health issues, such as those identified through a screening or self-referral process.

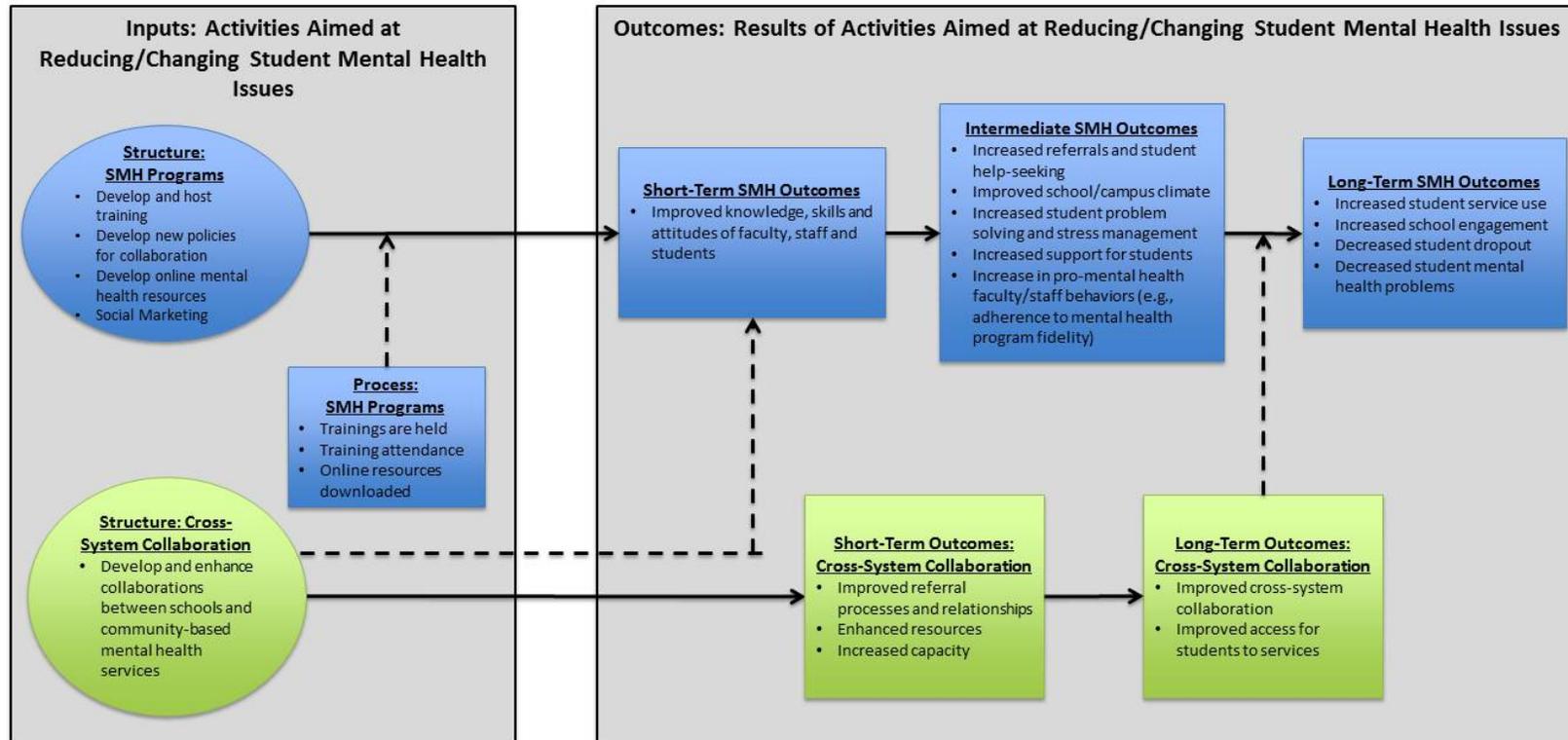
The focus among the CalMHSA SMH Program Partners is on primary and secondary prevention efforts. Thus, we concentrate our review on these as well.

RAND's Logic Model for Student Mental Health Program Evaluation

To guide our review of the evaluation of SMH programs and inform the evaluation of the CalMHSA PEI initiatives, we created a logic model that illustrates the relationships among structure, process, and outcome (short-term, intermediate, and long-term) measures (see Figure 2). Although pieces of this model have been established in the literature as discussed below (e.g., attendance at SMH program trainings are associated with improved knowledge, skills, or attitudes), the literature commonly lacks sufficient evaluation studies to support mediation or moderation effects among the various components. Hence, this model illustrates a proposed temporal relationship among common evaluation components in SMH programs based on the available student mental health literature.

As illustrated in Figure 2, the evaluation of SMH programs revolves around two key domains: (1) inputs aimed at reducing or changing factors that influence student mental health issues and (2) results of student mental health inputs related to changes or improvements in factors related to improving student mental health. In our logic model, inputs of SMH programs include structures and processes. Structures involve the development, refinement, and implementation of structures to support improved student mental health and may include the development of training materials and the delivery of trainings; the development of other resources that faculty, staff, and students can access; the development and implementation of new policies; and the development and delivery of information on campuses through such new avenues as social media. Subsequent processes may involve the delivery of and participation in trainings by faculty, staff, and students or the access of resources online. These structures and processes can result in several positive changes for short-, intermediate-, and long-term student mental health outcomes that may include improved knowledge and attitudes; positive behavior changes on the part of faculty, staff, and students; and, ultimately, improved student mental health and academic outcomes.

Figure 2. Student Mental Health Program Evaluation Logic Model



Our logic model also includes structures that school systems may build to enhance cross-system collaboration with other school systems and community-based mental health services and supports. Such partnerships can promote positive short-, intermediate-, and long-term outcomes for the service providers and their agencies as well as for students with mental health needs at all tier levels. For example, cross-system collaboration can result in the expansion of the range of support options accessible to students and their families, the coordination of services to meet comprehensive and culturally competent needs, and the development of efficient and sustainable referral networks. These system outcomes increase the capacity, quality, and effectiveness of services delivered, ultimately affecting student and family health and well-being

In the following section, we highlight a range of evaluative approaches that have been used to assess various structure and process outcomes of SMH programs (e.g., development of mental health program, engagement in and quality of training, posting and access of web-based materials) as well as programs' short-, intermediate-, and long-term outcomes (e.g., increase in referral for suicidal ideation, decrease in mental health stigma). However, despite the increase in recent years in SMH initiatives, many programs have not been evaluated. Among those that have, the evaluations focus primarily on process or short-term outcomes; very few have conducted multilevel evaluations, assessing a combination of processes, short-term outcomes, and individual student or school level outcomes.

Between January and February 2012, we searched the peer-reviewed literature to identify evaluation approaches and structure, process, and outcome evaluations for SMH and PEI studies. We conducted the search in five databases that focused on substantive areas pertaining to health (psychology and medicine), education, and the social sciences broadly: PsychINFO (psychology and social sciences), PubMed (medicine), ERIC (education), NY Academy of Medicine Grey Literature Collection (medicine), and Social Science Abstracts (social sciences), and included articles, reports, and chapters identified by evaluation team members. The search was not intended to be comprehensive but rather to identify exemplars of programs relevant to the SMH Program Partners' proposed activities. We focused our search on evaluations of SMH programs related to (1) improvements in knowledge, skills, and attitudes, (2) staff, faculty and student behaviors, (3) long-term student mental health outcomes, and (4) cross-system collaborations. Specifically, we conducted a literature search on the effect and evaluation of SMH programs looking for combinations of the following keywords: student, mental health, early intervention, school, program, randomized control trial, training, and evaluation. Additionally, we conducted a targeted literature search on evaluations of cross-system collaborations using a combination of the following keywords: collaboration, system, cross-system, school, mental health, and services. Because of changes in school practices, structures, and settings over the past several decades, we limited our search to studies published after 1990.

Evaluating Student Mental Health Programs

The literature on evaluating SMH programs suggests that such programs can be effective. As outlined in our logic model (Figure 2), evaluations of SMH programs assess a wide range of program components and outcomes related to student mental health. Evaluations examining

short-term changes in knowledge, skills, and attitudes resulting from SMH programs have consistently shown that such programs can improve staff, faculty, and student knowledge of mental illness; skills for identifying and referring students with symptoms; and attitudes toward mental illness (Kelly et al., 2011; Rodgers, 2010; Reis and Cornell, 2008; Ward, Hunter and Power, 1997; Wyman et al., 2008). A number of studies show that SMH programs can result in intermediate positive changes in staff, faculty, and student behaviors (e.g., (Horner, Sugai and Todd, 2005)(Sumi, Woodbridge and Javitz, 2012) . Evaluation of long-term effects (e.g., student mental health service utilization, improved student mental health, lower dropout rates) of SMH programs on mental health are less common, but the programs that do show effects (e.g., (Botvin et al., 1995)(Ellickson et al., 2003)(Greenberg et al., 1995) (Horner, Sugai and Todd, 2005) are commonly more comprehensive and intensive, of longer duration, are well structured, and attend to key components of implementation. Focusing on research that is most relevant to the CalMHSA evaluation, we provide an overview of selected scientific literature related to key components of SMH program evaluations: structure and process outcomes, short-term outcomes, intermediate-term outcomes, and long-term outcomes.

Structure and Process Outcomes

An initial evaluation of a SMH program may involve an examination of the program's structures and processes. For example, to what extent is the program evidence-based or incorporating the elements of effective programs, and do organizations develop resources to support programs, such as trainings? A number of organizations have developed registries of effective and evidence-based programs that can guide the development of SMH programs (e.g., <http://nrepp.samhsa.gov/>; <http://www.samhsa.gov/ebpwebguide/>). Evaluations of SMH programs may also examine such important processes as attendance at trainings and increased access to and use of available resources. Process outcomes may include the frequency of training programs; attendance rates at such trainings by staff, faculty, or peer educators; number of hits on a website or downloads of online resources; and exposure rates to mental health campaigns, which can provide useful information regarding the reach and acceptability of a SMH program.

Short-Term Outcomes: Improvements in Knowledge, Skills, and Attitudes

As suggested by the logic model, the short-term outcomes of SMH programs and their training efforts include improvements in staff, faculty, and student knowledge, skills, and attitudes or beliefs related to mental health disorders and associated stigma; actual and perceived skills in recognizing and referring students in distress; changes in attitudes or stigma related to access and efficacy of mental health services; and acceptability/feasibility of training efforts. Systematic evaluation of these short-term outcomes can play a key role in ensuring training efficacy, which is associated with reductions in student problem behaviors post-intervention (e.g., (Benner et al., 2010; Durlak and DuPre, 2008). Examples of programs that have assessed knowledge, skills, and attitudes as outcomes of staff or peer training include Youth Mental Health First Aid course (Kelly et al., 2011), At-Risk for High School Educators (Kognito, 2011), Applied Suicide Intervention Skills Training (ASIST; see , for a review), Question, Persuade, and Refer (QPR) (Reis and Cornell, 2008; Wyman et al., 2008); and Peer Education on

Substance Use (Ward, Hunter and Power, 1997). These programs have been evaluated using quantitative pre-post-training assessments.

In the above studies, staff and peer training has been associated with positive changes in participant's knowledge, skills, and attitudes (Rodgers, 2010; Reis and Cornell, 2008; Ward, Hunter and Power, 1997; Wyman et al., 2008), in some cases up to six months post-training (Kelly et al., 2011). However, some of these evaluations may lack validity because of their less rigorous evaluation designs (e.g., no control group in Kelly et al., 2011).

Evaluations of training often survey staff before training and conduct at least one post-training assessment to determine baseline levels of knowledge and skills and whether training participation results in improvements in knowledge, skills, or attitudes (Benner et al., 2010; Kognito, 2011; Reis and Cornell, 2008; Ward, Hunter and Power, 1997). In one rigorous evaluation of an online suicide prevention gatekeeper training program, which trains teachers and school staff to improve their abilities to detect students who may be at risk for suicide and to enhance their follow-up with appropriate services through engaging the student's social support networks and facilitating referrals for treatment and counseling (Goldsmith, Pellmar and Kleinman, 2002; Mazza, 1997; Centers for Disease Control and Prevention, 1994; U.S. Public Health Service, 1999), the At-Risk for High School Educators, Kognito (2011) investigated training outcomes among 191 high school teachers randomly assigned to receive the At-Risk training compared to 136 teachers who did not. Both groups of teachers completed a self-report measure of preparedness, readiness to act, and their self-efficacy in identifying, approaching, and referring at-risk students at baseline and immediately following training. This evaluation found that participants in the training group rated their preparedness to implement the program components (e.g., identify behaviors in distressed students, motivate students to seek help, refer students exhibiting distress) more highly than teachers in the comparison group did (Kognito, 2011).

Although random assignment is often methodologically ideal for evaluating programs, in many cases it is not feasible because of administrative constraints, financial limitations, or ethical concerns. In such situations, structured evaluations of the effect of training on staff knowledge and attitudes using pre-post or other designs (e.g., observational measures of the classroom environment to assess behavioral change) are alternatives to evaluating training effectiveness and potential influence on student mental health outcomes.

Other more subjective measures have also been used, including perceptions of training effectiveness, usefulness of materials and training sessions, program acceptability, and intrusiveness. These approaches have been used to evaluate peer-to-peer programs, as well as to evaluate the extent to which school personnel (e.g., psychologists, principals, superintendents who belong to an association) consider programs intrusive or acceptable to staff, parents, and students (Eckert et al., 2003; Hallfors et al., 2006b; Miller et al., 1999; Scherff, Eckert and Miller, 2005). Studies evaluating gatekeeper programs have often used surveys of trainees and school staff to examine program acceptability and school staff perceptions of knowledge and self-efficacy. These evaluations have commonly found that the programs are acceptable to school personnel (Eckert et al., 2003; Miller et al., 1999; Scherff, Eckert and Miller, 2005) and that school personnel feel significantly more effective in working with at-risk students after

receiving this type of training (King and Smith, 2000). Follow-up with parents and students about engagement in treatment suggests that referral and subsequent engagement is an area for continued improvement for gatekeeping programs (Kataoka et al., 2003; Kataoka et al., 2007). Often, the evaluation of perceptions of training effectiveness, usefulness of materials and training sessions, and program acceptability does not require pre-training assessments. These evaluation approaches may be quick and low-cost to implement; however, when used alone, they may be limited by their lack of objectivity.

In addition to changes in staff or peer educator knowledge, skills, and attitudes, evaluations of short-term outcomes have also focused on changes in student knowledge and attitudes as a result of exposure to SMH programs. For instance, students who participated in the Signs of Suicide (SOS) suicide prevention program had significantly greater awareness of depression and suicide three months after participating in the program than students who did not receive the program did (Aseltine and DeMartino, 2004). Other programs have also evaluated whether student knowledge and attitudes change. In the Mental Health First Aid training study, students reported receiving more mental health information from teachers during class but had no changes in student mental health or prosocial behaviors as assessed by student report on the Strengths and Difficulties Questionnaire as compared to students from schools that did not receive training (Jorm et al., 2010).

In summary, evaluations examining changes in knowledge, skills, and attitudes resulting from SMH programs have consistently shown that such programs can improve participants' knowledge, skills, and attitudes. These improvements are commonly seen in programs across the full range of participants (staff, faculty, students), and we are not aware of studies suggesting that the programs are more likely to benefit participants with specific sociodemographic characteristics. However, it is important to note that most of these programs have not empirically examined whether improvements in participants' knowledge, skills, and attitudes are associated with improvements in student outcomes, such as increased student help-seeking, decreased student mental health symptoms, or increases in student referrals to mental health services.

Intermediate Outcomes: Staff, Faculty, and Student Behaviors

Improvements in knowledge, skills, and attitudes will optimally result in important intermediate changes in such staff and faculty behaviors as increased referrals, increased support for students, improved fidelity of program implementation, and improved school/campus climate, as well as changes in such student behaviors as increased help-seeking and stress management, all of which are associated with improved student mental health outcomes. Recently, researchers (Sumi, Woodbridge and Javitz, 2012) demonstrated that program fidelity to a secondary-level behavior intervention in elementary schools was associated with intervention effectiveness, resulting in greater improvements in individual student outcomes including reduced problem behaviors and increased social skills. In fact, a one-standard-deviation increase in program fidelity increased the intervention effect on behavior rating scales between 25 and 68 percent (Sumi, Woodbridge and Javitz, 2012).

Many SMH evaluations focus on changes in staff or faculty behaviors as a result of training, such as participation in the training, adherence to program protocol, intervention dosage or

exposure (number of sessions implemented, length of each session, etc.), quality of program delivery, and student responsiveness or level of engagement in the intervention. The goal of staff, faculty, or peer counselor training is often to have these individuals serve as counselors or gatekeepers to at-risk students; thus, it is imperative that the skills taught in training sessions translate to tangible changes in staff/faculty and peer counselor skills and behaviors. For example, elementary school teacher participants in the Incredible Years teacher training programs learn how to promote students' social competence, emotional regulation, and problem-solving skills and to reduce behavior problems. In a number of evaluation studies of the training program, teachers showed such changes in behaviors as higher rates of praise toward students, lower rates of criticism, reported lower rates of student aggression and noncompliance, and greater child engagement in their classrooms than control teachers as measured by independent classroom observations (Webster-Stratton and Reid, 1999; Webster-Stratton, Reid and Hammond, 2004).

Evaluators use a variety of methods to assess staff training and implementation fidelity. Such implementation fidelity assessments can be used to assess many aspects of SMH programs but are commonly used to assess changes in trainee behavior following training. One of the most common approaches is an implementation checklist that assesses adherence to training protocol (e.g., (Filter et al., 2007; Hemmeter et al., 2007; Sumi, Woodbridge and Javitz, 2012; Walker et al., 2009; Hussey and Flannery, 2007). The checklist is typically completed by school administrators, teachers, trainers, or other school staff who have been trained to provide a SMH program. Evaluations of program implementation have shown that higher-fidelity ratings and greater classroom dosage are associated with better adaptive behavior, more prosocial skills, and fewer problem behaviors in students in a range of programs, such as First Step to Success (Sumi, Woodbridge and Javitz, 2012), Check in/Check out (Filter et al., 2007), The Good Behavior Game (Sanetti and Fallon, 2011), the Incredible Years Teacher Classroom Management (IY TCM) (Carlson et al., 2011), and a peer counselor-facilitated version of Brief Alcohol and Screening Intervention for College Students (BASICS) (Mastroleo et al., 2010).

Additional short-term program outcomes that may be assessed include increases in student referrals to mental health services, staff/faculty identification of and interventions with distressed students, or increases in student help-seeking behavior. Changes in these outcomes may be measured through teacher reports or school records and may demonstrate changes shortly following the implementation of programs. For example, referral to mental health services is an example of intermediate outcomes that have been examined for school suicide prevention programs that train gatekeepers (e.g., school staff members). Gatekeeper programs, examples of which include ASIST (see Rodgers, 2010, for a review), QPR (Reis and Cornell, 2008; Tompkins and Witt, 2009), and the LAUSD Youth Suicide Prevention Program (YSPP) (Nadeem et al., 2011; Stein et al., 2010), are designed to provide immediate support to at-risk students, engage the students' social support network, and facilitate referral and engagement with treatment and counseling services.

Another approach to evaluation involves examining changes in the school climate or culture—an approach that has been used by programs that target the entire student body. These evaluations may measure various constructs including improved school-wide health (e.g.,

relationships with staff, supportive leadership, consistent discipline policies; (Hoy and Tarter, 1997). Positive school climate has been associated with some beneficial outcomes including school success, academic achievement, and positive student development ((Cohen et al., 2009). MindMatters is a mental health initiative for secondary schools that uses a whole school approach to mental health promotion. Evaluations of informal workshops with staff (Wyn et al., 2000) and multisite longitudinal studies (Rowling and Mason, 2005) have assessed the promotion of positive school climate on student mental health and well-being and the development of strategies to enable a continuum of support for students with mental health needs. A recent report on MindMatters demonstrated improvements in student outcomes, including increased help-seeking; reduced bullying, disruptive behavior, and worrying behavior; fewer suspensions and expulsions; and increased knowledge and awareness of student mental health issues (Hazell, 2005).

Other programs aimed at promoting changes in school climate include the Positive Behavioral Interventions and Supports (PBIS) study. Evaluating organizational health before and after implementing PBIS in schools, Bradshaw et al. (2008) had school staff complete a questionnaire about their views of organizational health for their school. Findings illustrated improved organizational health over a five-year period (Bradshaw et al., 2008). Other PBIS evaluations have found that teacher adherence to the structure and process of PBIS played a significant role in reducing student problem behaviors (Benner et al., 2010). Together, these studies have shown that student school-wide mental health programs can positively influence school environments and that positive environments can be associated with improved student outcomes.

Long-Term Student Mental Health Outcomes

Evaluation of process outcomes as well as short-term and intermediate-term outcomes are often components of larger evaluations of SMH program effectiveness, contributing to longer-term program goals of improvements in student mental health outcomes, such as students' use of mental health services, student engagement in school, decreased school dropouts, and improved student mental health (e.g., suicide attempts, depression, substance use) (e.g., (Cho, Hallfors and Sánchez, 2005; Garlow et al., 2008; Haas et al., 2008; Hallfors et al., 2006b). Although many SMH program evaluations do not examine student outcomes, a number of studies, particularly those associated with evidenced-based practices or promising practices, have evaluated long-term student mental health outcomes.

Screening-based suicide prevention programs are an example of secondary prevention efforts that seek to identify students who are at-risk for suicide and refer these youth for appropriate care. These efforts commonly focus on screening the student body through questionnaires and interview assessments of behavioral health problems associated with suicide, such as depression and substance abuse, and identifying those in need of further care (Shaffer and Craft, 1999). For example, evaluators examined a process of screening and referring college students at-risk for suicide by embedding the PHQ-9, a depression questionnaire, in an anonymous online health questionnaire (the Interactive Screening Program American Foundation for Suicide Prevention that is monitored by a clinician who is available to chat anonymously online. These studies found

that high-risk students who chatted with an online clinician were three times more likely to seek further evaluation and treatment than those who did not chat with a clinician (Garlow et al., 2008; Haas et al., 2008).

Other programs focus more specifically on changes in student mental health risk and outcomes as indicators of program efficacy. For example, evaluations of Reconnecting Youth, a high school-based secondary prevention curriculum aimed at increasing school achievement and decreasing suicide risk and drug use in high-risk youth, has examined the effect on student mood management, drug use and consequences, risk behaviors, school achievement (GPA, number of credits/semester, dropout rates), and positive connections with teachers and families (Eggert, Nicholas and Owen, 1995). However, evaluations of the Reconnecting Youth program have had mixed findings; some schools showed positive effects on mood and smoking behavior, whereas others showed negative effects (Cho, Hallfors and Sánchez, 2005; Hallfors et al., 2006a). Specifically, Cho and colleagues found a positive effect on delinquency and negative effects on conventional peer bonding and smoking compared to the control group immediately after the intervention. However, at the six-month follow-up, they found only negative effects for GPA, anger, school connectedness, conventional peer bonding, and peer high-risk behaviors. This finding suggests that clustering high-risk youth in prevention interventions may have unintended negative effects.

Although not typically the primary objective of peer educator programs, involvement as a peer educator or counselor has also been evaluated as a secondary outcome to SMH programs and has been shown to be beneficial for peer counselors themselves (National Peer Educator Survey, Wawrzynski, LoConte and Straker, 2011). A number of other evaluations have had success in reducing student mental health problems (e.g., Check in/Check out has shown reductions in the number of office discipline referrals for students who entered the program), AOD use (e.g., BASICS resulted in reduced total drinks per week and heavy-drinking behaviors among college age students compared to controls), and improving prosocial behavior (First Step participants had significantly higher prosocial and adaptive skills and significantly fewer problem or maladaptive behaviors as perceived by teachers and parents (Sumi, Woodbridge, and Javitz, 2012). Other SMH programs that have assessed long-term student mental health outcomes and found improvements in student mental health outcomes include Olweus Bullying Prevention Program (Black and Jackson, 2007), Positive Behavior Support (Horner, Sugai, and Todd, 2005), Promoting Alternative Thinking Strategies (Greenberg et al., 1995); others have found improvements in substance use, such as Project Alert (Ellickson et al., 2003), and Life Skills Training (Botvin et al., 1995; Botvin et al., 2001).

In summary, although evaluations of the long-term mental health outcomes of SMH programs have been conducted, they remain relatively uncommon. For a substantial number of SMH programs, student mental health outcomes have either not been evaluated or have not demonstrated a significant long-term effect. Those that have demonstrated long-term improvements in student mental health outcomes are commonly more comprehensive and intensive, of longer duration, are well structured, and attend to key components of implementation.

Evaluations of Efforts to Improve Cross-System Collaboration

As stated above, cross-system collaboration, such as formalized partnerships between schools and local community mental health providers, can complement and enhance student mental health efforts and may even help such programs and efforts achieve better short-term, intermediate-term, and long-term outcomes. Providers of SMH programs engage in cross-system collaboration to share resources, strengthen referral networks, reduce duplicative services, increase service efficiency and capacity, and ultimately affect service quality and efficacy. Ultimately, the goal of such cross-system collaboration should be to create an infrastructure that complements the SMH programs' goals and is sustainable over time even if key members leave their representative agencies (Missouri System of Care, 2008).

Such collaborations are not often a primary focus of SMH programs, but several model examples are available that can inform the evaluations of SMH programs. As part of the "Safe Schools, Healthy Students Partner" Initiative, Frey et al. (2006) evaluated the collaboration among a Midwest school district and other partners. Participants representing each school completed a baseline Level of Collaboration scale that asked them to rate the level of collaboration with the other school partners on a 1 (no interaction at all) to 5 (collaboration) scale, and graphic depictions of the collaboration between partners were used to help programs visualize what areas of collaboration to improve and strengthen. The Level of Collaboration scales were analyzed at the individual-program level and found to improve over time.

The same project also used mixed-methods to evaluate collaboration at one site by collecting quantitative data on the strength of interagency collaboration (similar to the Frey et al., 2006, evaluation) and qualitative data from narrative descriptions of relationships and interviews with key leaders (Cross et al., 2009). Network analyses were also conducted at the group-level and found that collaboration increased over time. In a separate effort, SRI International evaluated San Mateo County's First 5 Special Needs project using the Systems Change Survey. Staff from various agencies completed a survey delivered by email at baseline and a year later (Petersen, Shea and Snow, 2010) and found that approximately half of respondents reported increased attendance in interagency meetings, and about 19 percent collaborated with other agencies to receive funds.

For more than a decade, researchers and practitioners have called for policy changes that encourage cross-system collaboration as a strategy to address critical infrastructure and practice issues in children's school-based mental health services (Burns et al., 1998; Huang et al., 2005; The National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health Intervention Development and Deployment, 2001). However, in the area of youth mental health, there is a paucity of empirical data regarding to what extent such improved collaborations can have a positive effect on student mental health (Berkowitz, 2001; El Ansari and Weiss, 2006) The extent of such an effect likely is related to the nature of the collaborative relationships and therefore is likely to differ substantially from project to project.

Summary: Methodological Challenges and Implications for Evaluating CalMHSA Student Mental Health Programs

As illustrated above, approaches to evaluating SMH programs range widely. However, each approach faces a range of methodological challenges.

Process evaluations and assessment of changes in short-term outcomes, such as knowledge and beliefs, are among the evaluation components that are easier to conduct. Process evaluations often rely on measuring the level of participation in a program, which is often achieved by counting the number of participants in it. In many cases, this data collection approach is sufficient for determining impact, but in other cases, a count provides little information regarding the reach of a program or training with respect to the level of participation among all potential participants who might benefit from the program. Changes in knowledge and attitudes are also relatively easy to assess, often through surveys of participants administered before and immediately after the training.

However, such evaluations, although useful, face several important limitations. There may be response bias among participants. For example, individuals may be more likely to endorse changes to attitudes after having just finished a multihour training designed to influence such attitudes. Such changes may also not persist for an extended period, and it may be useful to re-administer a survey after a period of time to determine if the effects of a training or program remain. Finally, it is important to note that although process evaluations and changes in short-term outcomes are important, relatively few evaluations have demonstrated that such changes are empirically associated with changes in student outcomes. Thus, the linkage to the desired long-term outcomes is unknown.

Evaluating changes in such intermediate-term outcomes as behaviors or campus climate involves a different set of challenges. A range of factors beyond the intervention being evaluated may influence such behaviors. In such situations, it is useful to have a comparison group. Random assignment to the intervention or comparison group is likely the strongest evaluation approach, but it is often challenging. School officials and parents may have concerns about the ethics of randomly assigning students to an intervention or comparison group, it may be logistically too difficult to conduct a random assignment, or it may be too difficult to prevent contamination between randomly assigned intervention and comparison groups. As a result, random assignment is used infrequently in evaluating primary prevention student mental health programs; it is used somewhat more commonly with secondary and tertiary prevention programs.

When a random assignment evaluation is used to evaluate school programs, it often occurs when an aspect of the implementation, such as a wait list for a program or the delivery of a curriculum to only some classes, lends itself to random assignment. Instead, evaluators often seek the most rigorous alternative approach, such as comparable students, classrooms, schools, or districts that did not receive the intervention.

Additional challenges in evaluating such intermediate-term outcomes as changes in behaviors or campus climate involve their assessment. In some cases, such evaluations require observations or secondary data in addition to self-reports, which may be more difficult or expensive to obtain. In other cases, the base rate of the behavior of interest may be relatively low (e.g., referral for a

suicidal student), making it difficult to demonstrate significant program effects without comprehensive data on a very large population or with a lengthy evaluation period.

The ultimate goal of most SMH programs is to decrease mental health problems among students (e.g., reduced rates of suicide, fewer behavioral problems, decreased dropout rates, increased student service use), but such evaluations also face a number of important methodological challenges. A number of these, such as the importance of having a comparison group, the potential need for secondary data, and situations in which the base rate of the behavior of interest may be relatively low, are described above. In addition, effects on long-term student mental health outcomes may only occur after cumulative exposure to the intervention or a period of time and may be affected by a range of other factors. These issues make it challenging to empirically demonstrate the effects of a SMH program on many long-term outcomes.

This overview of the literature relevant to the evaluation of the CalMHSA student mental health Program Partner efforts must be considered within the context of its limitations. Most important, the student mental health literature is extensive and varied and addresses a broad range of issues that extend well beyond what is relevant to the evaluation of the CalMHSA student mental health Program Partner efforts. A review of this entire body of literature is well beyond the scope of this review. However, in the introduction we have directed readers to several recent documents and would suggest that interested readers also examine information at several websites dedicated to school mental health for more recent information and publications relevant to the field (<http://csmh.umaryland.edu/>, <http://smhp.psych.ucla.edu/>, and <http://www.units.muohio.edu/csmbhp/>).

No single methodological approach or program outcome is appropriate for all SMH programs. Many evaluations have sought to evaluate process outcomes, short-term outcomes, as well as long-term student outcomes. In situations where there is no significant effect on long-term student outcomes, evaluations that investigate process, short-term, intermediate-term,, and long-term outcomes are well positioned to provide information regarding reasons why no effect was detected. A number of evaluations have also used a combination of qualitative and quantitative methods in evaluating programs, thereby providing a greater breadth and depth of information than evaluations using only one of these methods. Whatever evaluation approach is planned, it is essential that evaluation plans thoughtfully consider which outcomes can be reasonably examined in the time frame and with the resources allotted. In the future, however, the widespread adoption of the RTI framework by many schools and school districts may offer the opportunity to incorporate already-collected data and existing data infrastructure to enhance the evaluation of student mental health programs. Furthermore, the incorporation of technology to support many developing student mental health programs may also facilitate future evaluations that are able to more efficiently assess both effective implementation and a range of student outcomes for such initiatives and programs.

Appendix

Table A.1. Key Evaluations of Student Mental Health Programs

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
Aseltine et al., 2007	HS	Signs of Suicide	Suicide Prevention (SP)	Schools (N=9)	9 high schools were randomized to experimental or control groups. Surveys of students were conducted.	3 months after program end	(1) suicide ideation and attempts, (2) knowledge and attitudes about depression and suicide, and (3) help-seeking behavior	Quantitative
Benner et al., 2010	ES	Positive Behavior Support	Training (T)	Teachers (N=8); Students (N=37)	Pre-post naturalistic design to examine implementation of training efforts by teachers were evaluated using the Teacher Knowledge and Skills Survey (TKSS)(Cheney, Walker, and Blum, 2004) the modified version was used to ascertain the fidelity of implementation related to PBIS.	Pre-post-training	Knowledge	Quantitative; repeated measures
Black and Jackson, 2007	ES, MS	Olweus Bullying Prevention Program (OBPP)	Overall mental health (OMH)	Schools (N=6)	6 schools in an urban city using OBPP were evaluated over the course of 4 years. Evaluators used an observational measure of bullying incident density (observations carried out at bullying "hot spots") and the Olweus Bullying Questionnaire.	N/A	Bullying incident density	Quantitative
Botvin et al., 1995; Botvin et al., 2001	MS	Life Skills Training	OMH	School (N=56)	Schools were stratified by smoking prevalence and then randomly assigned Life Skills (with formal	6 years	Reductions in drug and polydrug use	Quantitative

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
					training), Life Skills (with video training), and a control group. Students completed questionnaires.			
Brown and Grumet, 2009	MS, HS	Columbia TeenScreen	SP	Students (N=229)	Students from 13 middle and high schools complete the screener.	N/A	(1) previous suicide attempt or ideation, (2) mental health symptoms	Quantitative; prevalence rates
Carlson et al., 2011	Pre-K, ES	Incredible Years Teacher Classroom Management (IY TCM)	T	Teachers (N=24)	Teachers were evaluated pre-post-training. Groups met for 8 sessions over an 8-10-week period for a total of 32 hours of training. Evaluate teachers' self-reported frequency of strategy use in the classroom and perceptions of strategy usefulness using self-report measure, Teacher Strategies Questionnaire (Webster-Stratton, Reid, and Hammond, 2001)	Post-training	(1) expectations and perceived effectiveness of program, (2) usefulness of training, (3) usefulness of specific techniques, (4) evaluation of workshop group leader, (5) overall program evaluation	Quantitative
Cho, Hallfors, and Sánchez, 2005; Hallfors et al., 2006b	HS	Reconnecting Youth	OMH	Schools (N=9)	9 high schools from 2 large urban school districts were randomized to experimental or control groups. Surveys of students were conducted at multiple time points.	1 year after program end	(1) perceived family support, (2) smoking, (3) high-risk peer bonding, (4) pro-social weekend activities, (5) school connectedness	Quantitative; intent to treat
Dimeff, 1999; Baer et al., 2001	C/U	BASICS	OMH	Students (N=461)	Students at 1 campus completed a questionnaire that included screening, high-risk students were invited to the study and then randomized to BASICS or no-intervention control. Students completed surveys annually for 4	4 years	(1) alcohol-related consequences, (2) quantity and frequency of drinking	

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
					years.			
Ellickson et al., 2003	MS	Project ALERT	OMH	School (N=55)	Schools were stratified by region and then randomly assigned within each region. Students completed questionnaires.	18 months	(1) past month and weekly alcohol, cigarette, and tobacco use, (2) alcohol-related consequences	Quantitative
Filter et al., 2007	ES	Check in/Check out program	T	Teachers (N=11), administrators (N=3), classified staff (N=3)	Using quasi-experimental design, teachers, administrators, and staff participated in implementation fidelity evaluation by completing paper-and-pencil ratings for the program.	Post-training	Fidelity reports; in summary, all 3 schools reported using the daily check in and check out components of the program and were regularly using data from the program for decisionmaking	Quantitative
Hemmeter et al., 2007	PreK	Positive Behavior Support	OMH	Centers (N=14)	Early childhood centers adopted a program-wide Positive Behavior Support model. Surveys and observations were conducted to measure implementation. 13 staff members participated in a focus group.	N/A	(1) program implementation, (2) self-efficacy	Quantitative, qualitative, theme extraction
Horner, Sugai, and Todd, 2005	ES	Positive Behavior Support	OMH	Schools (N=60)	Schools were randomized into experimental and control wait-list groups. During the 3-year study, schools implemented the School-wide Positive Behavior Support program at designated time points.	N/A	(1) program implementation, (2) perceived school climate, (3) discipline referrals, (4) state reading standard	Quantitative
Hussey and Flannery, 2007	ES	Second Step	T	Teachers/classes grades K-2 across eight schools (N=64)	Teachers self-reported weekly activity implementation in classroom using Social Emotional Learning Checklist, and project leaders complete implementation	1 year	Fidelity of training implementation	Quantitative, qualitative

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
					checklists weekly during classroom observation to determine if lessons are presented regularly and according to the scope and sequence of the Second Step curriculum.			
Kincaid et al., 2002	C/U	Positive Behavior Support	OMH	Staff (N=397)	Staff members of teams in a consortium for Positive Behavior Support programs completed surveys (Behavior Outcome Surveys) on program process measures.	N/A	(1) problem behavior events, (2) severity of events, (3) duration of events	Quantitative
Kognito, 2011	C/U	At-risk training	T, SP	Faculty (N=420)	College and university faculty were recruited to participate in the At-Risk on-line gatekeeper training simulation. Participants (N=1,624) who completed the training were asked to complete a questionnaire about the experience. Respondents were asked to complete a 3-month follow-up survey (N=131).	3-4 months	(1) frequency of faculty referrals of students to services, (2) faculty concern for students, (3) perceptions of knowledge and skills to identify, approach, and refer students, (4) perceived quality of training course	Quantitative; repeated measures
Leung et al., 2003	C/U	Triple P	OMH	Parents (N=91)	Parents with a child ages 3-7 who use maternal and child services within the community of interest were randomly assigned to intervention or waitlist control groups. All participants completed a pre-intervention questionnaire, weekly phone consultations (15-30 minutes), and a post-intervention questionnaire.	2 weeks	(1) child behavior problems, (2) dysfunctional parenting styles, (3) parent self-efficacy	Qualitative, quantitative

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
Limber et al., 2004	ES, MS	OBPP	OMH	Schools (N=6)	6 schools were nonrandomly assigned to the experimental group and each matched to a control comparison school (N=6) based on community and school demographics. Students completed the Olweus Bullying Questionnaire.	N/A	(1) rate of bullying, (2) school misbehavior events	Quantitative
Mastroleo et al., 2010	C/U	BASICS substance abuse prevention	Peer-to-peer (P), T, OMH	Peer counselors (N=19), college student participants (N=238)	Effectiveness of the program was assessed using the Peer Proficiency Assessment during 4 sessions to assess motivational interviewing skills demonstrated among peer counselors. College student drinking measured at baseline and 3 months post-intervention in a self-report survey on daily drinking	3-month follow-up survey to college students	(1) peer counselor skill demonstration, (2) participant drinking, (3) participant awareness of negative consequences	Quantitative; repeated measures
Nadeem et al., 2011	HS	LAUSD Youth Suicide Prevention Program	SP, T	Staff (N=45)	5 focus groups and 10 individual administrator interviews were conducted across 5 different schools. Staff perceptions of training and effectiveness were assessed using semi-structured interviews. Focus was on teacher perspectives (N=26).	N/A	Staff perceptions of (1) ability to detect students at-risk for suicide, (2) communication and referral procedures, (3) post-crisis issues, and (4) training.	Qualitative (teachers); theme extraction
Olweus, 2005	ES, MS	OBPP	OMH	Schools (N=100)	Schools applied for participation in the program at which point students completed the Olweus Bullying Questionnaire for baseline assessment. The questionnaire was completed again by students after 1 year when schools had worked with	N/A	(1) bullied students, (2) bullying students, (3) behaviors to stop bullying events	Quantitative

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
					OBPP for 8 months.			
Pagliocca, Limber, and Hashima, 2007	ES	OBPP	OMH	Schools (N=3)	3 schools that implemented OBPP were evaluated on program effectiveness using student and teacher survey data.	N/A	(1) bullying frequency, (2) students reporting a bullying event, (3) students' perception of teachers ensuring their safety, (4) teachers' perception of rules against bullying, (5) teachers' perception to react to bullying event	Quantitative
Perry et al., 1986	MS	Amazing Alternatives and Keep it Clean: Peer leaders in health education	P, T, OMH	Elected peer leaders, 7th grade (N=207)	Peer leader training during two 4-hour sessions in groups of 20-40 peer leaders; trained to teach classmates about short- and long-term consequences of smoking and substance abuse. Teachers trained on program components and how to support/use peer leaders. Questionnaire of peer leader perceptions of training, skills and effectiveness. No evaluation of realized knowledge or skills.	Post-test	(1) perceived skills and competence in implementing program, (2) perceived acceptance of program, (3) perceived effectiveness in promoting non-use	Quantitative, qualitative
Prinz et al., 2009	C/U	Triple P	OMH	County (N=18)	Counties were stratified by 3 population variables and randomly assigned to dissemination of Triple P or care-as-usual control. Outcomes measures were drawn from pre and post intervention (2 years) telephone surveys of randomly selected residents, telephone interviews with service providers, and population data.	N/A	(1) cases of child maltreatment, (2) out-of-home placement, (3) injuries due to child maltreatment	

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
Reis and Cornell, 2008	C/U	Question Persuade Refer Training	P, SP, T	Resident assistants (RA) (N=73) and teachers (N=165)	Comparison of peer counselors and teachers on measures of suicide knowledge and prevention practices at average of 4.7 months after participation in a statewide QPR training program. Surveys were conducted by phone, postal mail, or Internet.	Follow-up post-training at average of 4.7 months	Staff knowledge of suicide risk factors	Quantitative, pre-post evaluation using comparison group
Reis and Cornell, 2008	ES, MS, HS	QPR Training Program	SP, T	Staff (N=403)	Counselors and teachers (N=1,081) who participated in a statewide training program in student suicide prevention using the QPR program were asked to complete the Student Suicide Prevention Survey. Respondents (N=403) were compared to a general sample of staff from other schools who had not yet received the training (N=252) on the same survey, which measures suicide knowledge and prevention practices.	4 months	(1) knowledge of suicide risk factors, (2) use of no-harm contracts, (3) referrals to services of identified students	Quantitative
Sadler and Dillard, 1978	HS, MS	TRENDS: substance abuse education	P, T, OMH	Teen counselors (N=100), 6th grade classrooms (N=25)	Teen counselors (N=100) from 8 high schools completed eight 2-hour training sessions and a knowledge test on drugs, alcohol, and smoking. Counselors were randomly assigned to 6th grade classrooms and compared to randomly selected 6th grade classrooms with teacher lecture on substance abuse. All 6th graders completed pre- and post-intervention knowledge tests and a consumer questionnaire for those in	Pre- and post-test	(1) teen counselor knowledge, (2) student and staff perceptions of intervention	Quantitative; repeated measures; Randomized Controlled Trial (RCT)

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
					intervention.			
Sanders, 2008	C/U	Triple P—Positive Parenting Program	OMH	Parents (N=3000)	Large-scale population trial targeting parents of children ages 4-7 residing in 10 geographical catchment areas in Australia. Catchment areas receiving the population-wide intervention were matched to 10 comparable areas in 2 other cities. Parents were randomly selected in the 20 areas to receive household survey phone calls pre and post intervention (2 years).	N/A	(1) parent and child emotional problems, (2) parent and child psychosocial difficulties, (3) Strengths Difficulties Questionnaire scores	Quantitative
Eckert et al., 2003; Miller et al., 1999; Scherff, Eckert, and Miller, 2005	HS	Suicide screening	SP	Superintendents (N=501); school psychologists (N=211), principals (N=185)	Membership directory of superintendents who were stratified by 5 geographical regions and randomly sampled. Participants were randomly assigned to 1 of 3 case scenarios (curriculum, staff training, or screening).	N/A	Staff perceptions of (1) acceptability, (2) intrusiveness	Quantitative, between-groups
Shaffer et al., 2004	HS	Columbia SuicideScreen	SP	Students (N=1729)	Students who endorsed risk items on the screen and those who did not were matched on age, gender, and ethnicity.	N/A	(1) suicide ideation and attempts	Sensitivity and specificity; cost-effectiveness
Shaffer et al., 2004	HS	Columbia SuicideScreen	SP	Students (N=1729)	Students who endorsed risk items on the screen and those who did not were matched on age, gender, and ethnicity.	N/A	(1) suicide ideation and attempts	Sensitivity and specificity; cost-effectiveness
Silvia et al.,	MS	Responding in	T	Teachers (N=854)	The study team collected	3 years	(1) teacher implementation of	Quantitative nested

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
2011		Peaceful and Positive Ways (RiPP) and Best Behavior: Violence Prevention		nested within schools (N=40)	implementation data through the teacher survey, class records, annual school prevention coordinator and teacher interviews, and classroom observations.		program (student exposure to program), (2) curriculum fidelity, and (3) teacher perception of effectiveness of prescribed teaching strategies	hierarchical models, qualitative
Stein et al., 2010	HS	Los Angeles Unified School District YSP	SP	Schools (N=11)	Schools stratified by low/high YSP utilization intensity and randomly sampled to participate. Principals nominated a variety of clinicians and teachers who would be likely or unlikely to interact with at-risk students. Semi-structured phone interviews were conducted.	N/A	(1) school-level organization and use of resources in response to a student at risk for suicide (e.g., procedures, policies, and structures), (2) school leadership and priorities, and (3) district-level training and support.	Qualitative (high vs. low implementation); theme extraction
Tompkins and Witt, 2009	C/U	QPR Training	T, SP, P	Resident assistants (N=240)	Resident assistants (N=240) from 6 private institutions in rural and urban Pacific Northwest participated in QPR training. Institutions self-selected to participate in the study. RAs completed gatekeeper training evaluation survey immediately pre and post intervention.	Post-training	(1) knowledge and appraisal, (2) intent to change behavior, (3) self-efficacy	Quantitative; repeated measures
Ward, Hunter, and Power, 1997	C/U	Peer Education on Substance Use	P, T	Adolescents and young adults (ages 15-25) (N=72)	Evaluation of training activities (semi-structured interviews with program staff, focus groups with peer educators, individual training programs, monitoring of peer-educator activities, and observation of peer support-group meetings) using a brief evaluation questionnaire with each group of	Post-training	(1) knowledge/skills of educators, (2) behaviors of educators, (3) drug use of adolescents/young adults	Qualitative

Ref	Sample	Program	Focus	Level of analysis	Research Design	Longest follow-up	Evaluation Outcomes	Analytic Approach
					peer educators upon completion of training program; student outcomes also evaluated.			
Warren et al., 2006	MS	Positive Behavior Support	OMH	Students (N=737)	Case study of student behavior intervention outcomes in an inner-city middle school in the Midwest.	NA	(1) discipline referrals, (2) in-school conferences, (3) in- and out-of-school suspensions	Quantitative
Wyman et al., 2008	HS	QPR Training Program	T, SP	Staff (N=249)	Staff were stratified by school and grade level and randomly sampled to complete QPR training. In the schools (N=32) of the randomized trial, staff completed the Suicide Prevention Survey and students (N=2,059) completed an annual school survey that includes questions on suicidal ideation and behavior.	1 year	(1) staff knowledge and appraisal, (2) student suicide ideation	Quantitative

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