

THE STATUS OF SCHOOL-BASED MENTAL HEALTH SERVICES FOR
STUDENTS WITH DISABILITIES

A Dissertation

By

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Submitted to the Office of Graduate and Professional Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

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December 2016

Major Subject: Educational Psychology

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ABSTRACT

Mental health problems in children and adolescents are a rising nationwide and global issue. Disabilities put youth in poorer mental health conditions and pose a higher risk for mental health disorders. Schools have become the primary providers of mental health services. It was reported that schools served the overwhelming majority of children (70% to 80%) who received any mental health services. Study 1 investigated the effects of school-based mental health (SBMH) services on academic achievement and behaviors over five years for students diagnosed with disabilities by analyzing data from the Special Education Elementary Longitudinal Study (SEELS). Results were based on latent growth curve modeling. Results indicated that SBMH predicted faster improvement of academic performance and confirmed the bidirectional relationship between behavior and academic achievement, in which the initial behavior positively predicted the improvement of academic achievement over time, and vice versa. Moreover, these findings varied depending on participant characteristics. Specifically, initial positive behavior level positively predicted initial academic performance for both boys and girls, Caucasians, low-incidence disabilities, medium and high suspension, medium and high SES, and suburban students; initial behavior level positively predicted improvement in academic performance for girls, high-incidence disabilities, low SES, and rural students; and initial academic performance level positively predicted improvement in positive behaviors for boys, Caucasians, low-incidence disabilities, medium suspension, medium and high SES, and urban students.

Study 2 evaluated the effectiveness of evidence-based SBMH programs for students diagnosed with disabilities using meta-analysis. One hundred and nine (109) evidence-based programs were identified and 30 randomized controlled trials were included for analyses. The overall treatment effect size (Cohen's *d*) was .40, indicating that disabled youths who received evidence-based mental health interventions improved .4 standard deviation more than those who did not receive or received other services on the outcome measures. Moderation analyses indicated that intervention length significantly explained the variations among effect sizes, with less-than-18 sessions more effective than more sessions. Implications for research and practice were discussed.

ACKNOWLEDGMENTS

I would like to use this opportunity to thank my chair Dr. Burke and co-chair Dr. Bowman-Perrott, who taught me so much about research and gave me so many opportunities to work in your research groups to learn what real research looks like. Also, I would like to express my deep appreciation to my committee members: Dr. Liew, from whose class I found my research interest. Especially thanks for your feedback on my dissertation proposal, your feedback drove me to think harder and refine my dissertation. Dr. Willson, from whose classes I learned advanced research methods such as SEM and meta-analysis. I applied every little bit of everything I learned from your classes into my dissertation. Without these classes, this dissertation cannot be completed. And Dr. Thompson, who is always helping me on this journey. Your reviews make me see where improvements are needed, but more importantly, they make me feel hope and give me the strength to stretch myself and think and try to do a better job.

Additionally, I would like to extend my gratitude to my fellow graduate students, Samar Zaini and EeRea Hong. Your selfless help and encouragement made my life better. Finally, I want to thank the computer lab where I spent days and nights working on this dissertation, and especially, dear Mr. Pageson, who lends me this place. Without this place, nothing could happen.

CONTRIBUTORS AND FUNDING SOURCES

This work was supervised by a dissertation committee consisting of Professors Mack Burke (advisor), Lisa Bowman-Perrott (co-advisor), Jeffrey Liew, Victor Willson, and Bruce Thompson. All work for the dissertation was completed independently by the student.

There are no outside funding contributions to acknowledge related to the research and compilation of this document.

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CHAPTER I

INTRODUCTION

Mental health problem in children and adolescents is a rising nationwide and global issue. The World Health Organization estimated that mental health problems would become the primary cause of youth illness by the year 2020. In the United States, approximately 20 – 25% youths meet criteria for a mental disorder with severe impairment across their lifetime (Cuellar, 2015); however, approximately 80% of these youths barely have their needs met (Kataoka, Zhang, & Wells, 2002). Left untreated, mental health problems can evolve into chronic diseases over an individual’s lifespan. Research found that 73.9% of adult mental health problems had their diagnostic origin before the age of 18 and 50% had their origin before the age of 15 (Gregory et al., 2007; Kim-Cohen et al., 2003).

Disabilities put youth in poorer mental health conditions and pose a higher risk for mental health disorders (Kariuki, Honey, Emerson, & Llewellyn, 2011). Elevated mental health problems in youths with disabilities could lead to severe behavioral, emotional, and social problems (Ailey, 2003; Cambra & Silvestre, 2003; Gresham & MacMillan, 1997; Hassiotis & Turk, 2012; Jackson, Enright, & Murdock, 1987; Margalit & Levin-Alyagon, 1994; Pavri & Luftig, 2001). Disability does not only affect an individual’s current mental health status, but research also established the evidence that there is a “long-arm” effect of childhood disability on mental health status in adulthood (Latham, 2015). Despite the elevated risk of mental health problems caused by disability, mental

health problems in youths with disabilities were often undiagnosed and untreated (Sturgeon, 2006).

A frequency analysis of the nationally representative data from Special Education Elementary Longitudinal Study (SEELS) revealed that approximately one in three children with any disability experienced mental health problems at a level that entailed mental health services either from schools or other resources. This number did not include those whose parents did not report service situation or those who suffered from mental health problems but did not receive necessary treatment due to the lack of identification. Of those who received mental health services, more than half (55.8%) received these services at schools or at the district level. In consideration of the high number of disabled students receiving school-based mental health services, it is important to examine the potential benefits of these services on student overall well-being so that decision-makers could decide the necessity to invest financial and personnel resources in mental health mental health services for students with disabilities.

In the other aspect, the call for the evaluation of the evidence base for mental health practices received keen interest when the President's New Freedom Commission on Mental Health emphasized the importance of identification of evidence-based mental health interventions in school settings (Hogan, 2003). Several organizations evaluated currently implemented school-based mental health programs based on rigorous research standards and numerous programs have been classified as evidence-based interventions for the general school population (Kutash, Duchnowski, & Lynn, 2006). However, the

majority of school efforts on mental health intervention is still unknown (Masia-Warner, Nangle, & Hansen, 2006), and there is a paucity of research literature focusing on the status of mental health services for students with disabilities (Rones & Hoagwood, 2000). Moreover, in consideration of the substantial implementation cost and training efforts, it is important to determine if evidence-based interventions produce superior outcomes than other treatments or no treatment.

Research Purpose

The current dissertation project consisted of two studies. Study 1 examined the effects of SBMH on the development of academic achievement and behavior health for students with disabilities, and factors that influenced treatment effects. To do this, Study 1 analyzed the nationally representative data from the Special Education Elementary Longitudinal Study (SEELS). Research questions included:

1. What are the effects of school-based mental health services on the development of academic achievement and behaviors over time?
2. Will these SBMH effects be moderated by participant gender, ethnicity, disability, school suspension severity, SES, and urbanicity?

Study 2 used meta-analysis to evaluate the efficacy of evidence-based mental health programs used in school settings for students with disabilities. Research questions were:

1. What are the characteristics of participants and interventions of identified studies that focused on evidence-based school mental health programs for disabled youths?
2. What is the overall effect size of evidence-based school mental health interventions

for students with disabilities?

3. What are the moderation effects of a cluster of moderators on the overall effect size?

Moderators included disability type, intervention level, age, gender, ethnicity, SES, service provider, program length, program timing, parental involvement, and homework involvement.

CHAPTER II
EFFECTS OF SCHOOL-BASED MENTAL HEALTH SERVICES FOR STUDENTS
WITH DISABILITIES: ANALYSIS OF SEELS DATA

Introduction

Globally, mental disorders contributed the most to the disability-adjusted life years, a measure of the number of years lost due to disability (Mathers & Loncar, 2006). An estimation from the World Health Organization (WHO) indicated that mental health problems would become the primary cause of youth illness by the year 2020. In the United States, approximately 20 – 25% youths meet criteria for a mental disorder with severe impairment across their lifetime (Cuellar, 2015).

Mental health is “a state of well-being in which individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community” (World Health Organization, 2001, p. 1). The concept of mental health disorder is extremely extensive and there is no consensus on what counts as a mental health disorder (Ginn & Horder, 2012). The Australian National Mental Health Strategy defined mental disorders as “those that affect a person’s cognitive, emotional or social abilities and attract a diagnosis of psychiatric illness” (Fuller, Edwards, Procter, & Moss, 2000, p. 148). The National Institute of Mental Health considered anxiety disorders, attention deficit hyperactivity disorder, autism spectrum disorders, bipolar disorder, borderline personality disorder, depression, eating disorders, generalized anxiety disorder, obsessive-compulsive

disorder, panic disorder, post-traumatic stress disorder, schizophrenia, social phobia, and suicide as mental health disorders and supported research in these areas.

Mental Health Problems in School-Aged Children

Approximately 20-30% of children and adolescents in the United States have a diagnosable mental disorder (Roberts et al., 1998). Half of these youth have substantial functional impairments and 25% experience extremely impaired functioning (Shaffer et al., 1996). In addition, many children are inflicted with less severe functional impairments and distress caused by deficits in social-emotional skills (Masia-Warner, Nagle, & Hansen, 2006). Results from a survey study with 1,147 schools in 1,064 districts in the United States indicated that for both boys and girls, the most frequently reported mental health problems were problems in social, interpersonal, or family functioning. Behavior problems, such as aggression or disruptive behavior and ADHD, were most common in boys, and anxiety and adjustment problems were most phenomenal for girls. With the increase of school level, the frequency of depression and substance abuse increased sharply (Teich, Robinson, & Weist, 2008).

There is a well-documented gap between the number of children who received mental health services and the number who needed these help, the estimated ratio was less than 1 to 5 (Burns et al., 1995). Left untreated, mental health problems can evolve into chronic diseases over an individual's lifespan. Research found that 73.9% of adult mental health problems had their diagnostic origin before the age of 18 and 50% had their origin before the age of 15 (Gregory et al., 2007; Kim-Cohen et al., 2003).

Research found that child mental health problems have long-term negative consequences, including lower educational attainment, lower wages, lower likelihood of employment, and more crime (Cuellar, 2015).

Mental Health Problems in Youth with Disabilities

Disabilities put youth in poorer mental health conditions and pose a higher risk for mental health disorders (Kariuki, Honey, Emerson, & Llewellyn, 2011). Data on the prevalence of mental health problem in youth with disabilities indicated that 39-50% of children with intellectual disabilities needed mental health services compared to 10-18% of normally intelligent children who needed these services (Dekker & Koot 2003; Emerson 2003). A recent study found that 50 of 75 adolescents with intellectual disabilities were diagnosed with a mental disorder (Hassiotis & Turk, 2012). In a sample of Australian youth with physical, sensory, or intellectual disabilities, participants with disabilities reported poorer mental health condition compared to non-disabled peers (Honey, Emerson, & Llewellyn, 2011). Similar findings were found with learning disabilities (Reid, 1994). For individuals with developmental disabilities, the prevalence of mental health problems was estimated to be the same as that in the general population (Ailey, 2003). A frequency analysis of the nationally representative data from Special Education Elementary Longitudinal Study (SEELS) revealed that approximately one in three children with any disability experienced mental health problems at a level that entailed mental health services either from schools or other resources. This number did not include those whose parents did not report service situation or those who suffered

from mental health problems but did not receive necessary treatment due to the lack of identification.

Elevated mental health problems in youths with disabilities could lead to severe behavioral, emotional, and social problems. Adolescents with intellectual disabilities were reported to be more disruptive and antisocial compared to norms (Hassiotis & Turk, 2012). Individuals with developmental disorders experienced problems with social skills, social support, and aggression (Ailey, 2003). Academic and social skill deficits have been observed in students with hearing impairments, learning disabilities, and physical disabilities (Cambra & Silvestre, 2003; Jackson, Enright, & Murdock, 1987). Students with disabilities also had low self-concept and self-esteem (Cambra & Silvestre, 2003). Several studies indicated that children with disabilities had poor social adjustment skills and often felt lonely and unsatisfied with peer relationships (Gresham & MacMillan, 1997; Margalit & Levin-Alyagon, 1994; Pavri & Luftig, 2001).

Disability does not only affect an individual's current mental health status, but research also established the evidence that there is a "long-arm" effect of childhood disability on mental health status in adulthood (Latham, 2015). People with early disability onset tended to experience more mental health problems in later life (Klingbeil, Baer, & Wilson, 2004; Thompson, 2004). Latham (2015) found participants who had a disability before 16 years of age reported an average of .72 more depressive symptoms in late midlife than those without childhood disabilities. Despite the elevated

risk of mental health problems caused by disability, mental health problems in youth with disabilities were often undiagnosed and untreated (Sturgeon, 2006).

School-Based Mental Health Services

Psychosocial barriers have been found to lead to the failure in learning for almost 30% of school students (Adelman & Taylor, 2006) and a growing consensus has emerged regarding the importance of mental health for successful school experience (Hunter et al., 2005). Schools have become the primary providers of mental health services. It was reported that schools served the overwhelming majority of children (70% to 80%) who received any mental health services, and for the majority of these children school was the only source of service (Burns et al., 1995).

Providing mental health services in schools has several advantages. First, school is an efficient pathway to reach naturally the largest number of children. Research found 98% of referred students had access to school-based mental health services, compared to only 17% of similar students entered treatments provided by clinics (Catron & Weiss, 1994). Second, schools provide data on disciplinary records, academic performance, social skills, social adjustment, and teacher reports to assist better decision-making in mental health services. Third, receiving mental health services at schools reduces the stigma associated with hospital or clinic visitation. Finally, school is the most efficient channel to avoid such issues as insurance and transportation, thus promotes continuing participation (Browne et al., 2004; Farrell, Meyer, Kung, & Sullivan, 2001). Although concerns about lack of parent involvement and systems issues may compromise the

effectiveness of school-based services compared to clinic services, a large-scale study with 36 inner city schools and a central clinic found comparable improvements for students who received services at different sites (Armbruster & Lichtman, 1999). Similarly, Baskin et al. (2010) concluded from their meta-analysis that mental health interventions conducted in school settings were as efficacious as those conducted in other settings.

A three-tiered approach is one of the most comprehensive strategies for delivering school-based mental health services (Levitt & Merrell, 2009). This approach consists of three preventive intervention levels that are increasing in intensity and shrinking in target student number. Tier 1 is universal intervention that targets all students in the school. The goal is to reduce new mental health problem occurrence. Tier 2 is selected intervention that serves 5-10% of students who are at higher risk of developing mental health problems compared to their peers. Students in this tier are selected by universal screening or by teacher nomination. Tier 3 is indicated intervention for 1-5% of students who show mental disorder symptoms.

Research Purpose

There is a paucity of research literature focusing on the status of mental health services for students with disabilities (Rones & Hoagwood, 2000). Analysis of the SEELS data indicated that for students with disabilities who received mental health services, more than half (55.8%) of them received these services at schools or the district level. Unfortunately, the majority of school efforts on mental health intervention is still

unknown (Masia-Warner et al., 2006). In consideration of the high number of disabled students receiving school-based mental health services, it is important to examine the effects of these services so that decision-makers could decide the necessity to invest financial and personnel resources in mental health services for students with disabilities.

The current study aimed to examine the effects of SBMH on the development of academic achievement and behavior health for students with disabilities, and factors that influenced treatment effects. To do this, the current study analyzed the nationally representative data from the Special Education Elementary Longitudinal Study (SEELS). Research questions were proposed as follows:

1. What are the effects of school-based mental health services on the development of academic achievement and behaviors over time?
2. Will these SBMH effects be moderated by participant gender, ethnicity, disability, school suspension severity, SES, and urbanicity?

SBMH was hypothesized to have positive effects on the development of academic achievement and behaviors over time.

Method

Participants and Procedures

Participants were drawn from the SEELS (Wagner, Kutash, Duchnowski & Epstein, 2005). SEELS is nationwide longitudinal study commissioned by the Office of Special Education Programs of the U.S. Department of Education. SEELS collected data on students receiving special education, their characteristics, experiences, and achievements

in three waves over five years starting from December 1999. Parents (or legal guardians), teachers (or school staff), and school principals were interviewed for information on characteristics of students, household, non-school factors, schools and school programs, and students' educational or other outcomes.

Participants in SEELS were students with disabilities aged 6 through 12 years at the study outset. Samples in SEELS were recruited using a two-stage stratified random sampling approach to ensure their representativeness. The sample was first stratified based on local educational agency (LEA)-related characteristics, such as age, geographic region, size, and wealth, then by special education disability category. Participants in SEELS represented students eligible for the 12 disability categories under IDEA at that time. The 12 disability categories were learning disability, speech impairment, mental retardation (i.e., intellectual disability), emotional disturbance, hearing impairment, visual impairment, orthopedic impairment, other health impairment, autism, traumatic brain injury, multiple disabilities, and deaf/blindness. Samples in SEELS were nationally representative of students in each age group and each disability category. Information gathered from SEELS are nationally generalizable.

Participants of the current study were selected based on three screening gates: (a) parents of participants must respond to question "*During the past 12 months has (name of child) received psychological or mental health services provided by school/district?*" Students whose parents did not answer this question were deleted. (b) Participants must reside in schools where information about social adjustment supports were provided.

These social adjustment supports included mental health services, personal/group counseling, therapy, psychiatric care, behavioral intervention, behavior management program, and social work services. This variable was derived from the question “*Number of social adjustment supports*” in the school program questionnaire. Participants were deleted if schools did not provide this information on all three waves or when schools only responded for one or two waves and these responses were 0. Participants were retained if schools responded for three waves on this question or responded for only one or two waves but these responses were not 0. This criterion was imposed to improve the accuracy of parent response by deleting those parents who answered yes in (a) but whose schools did not even provide these mental health services. (c) Participants must have at least one school suspension experience. This criterion was imposed on participants because school suspension was considered as a proxy for the severity of behavioral/mental health problems. Students in the SEELS project were not randomly assigned, but in order to compare the effects of SBMH, participants in the SBMH group and control group should be as homogeneous as possible. Therefore, school suspension was used as a marker to decide homogeneity of students in the two groups. This variable was derived from the question “*Total number of suspensions/expulsions at school in 1999-2000*” in the school characteristics questionnaire. The final sample consisted of 1,177 students. Table 1 presents sample demographic information.

Table 1
Summary of Participant Demographic Characteristics

Demographic Characteristics	SBMH (n = 451)	Non-SBMH (n = 726)
Gender		
Male	315 (69.8%)	474 (65.3%)
Female	136 (30.2%)	252 (34.7%)
Ethnicity		
Caucasian	312 (69.2%)	569 (78.4%)
African American	85 (18.8%)	81 (11.1%)
Hispanic	38 (8.4%)	57 (7.9%)
Asian/Pacific Islander	8 (1.8%)	7 (1.0%)
American Indian/Alaska Native	6 (1.3%)	7 (1.0%)
Multi/Other	2 (.4%)	5 (.6%)
Disability		
Learning Disability	36 (8.0%)	95 (13.1%)
Speech Impairment	19 (4.2%)	38 (5.2%)
Mental Retardation	41 (9.0%)	68 (9.4%)
Emotional Disturbance	78 (17.3%)	28 (3.9%)
Hearing Impairment	48 (10.6%)	82 (11.3%)
Visual Impairment	26 (5.8%)	49 (6.7%)
Orthopedic Impairment	28 (6.2%)	95 (13.1%)
Other Health Impairment	59 (13.1%)	111 (15.3%)
Autism	64 (14.2%)	102 (14.0%)
Traumatic Brain Injury	21 (4.7%)	20 (2.8%)
Multiple Disabilities	31 (6.9%)	37 (5.1%)
Deaf-Blindness	0 (0.0%)	1 (.1%)
Suspension Severity		
Low Suspension	126 (27.9%)	222 (30.5%)
Medium Suspension	199 (44.2%)	314 (43.3%)
High Suspension	126 (27.9%)	190 (26.2%)
Household Income		
Under \$25,000	165 (36.6%)	167 (23.0%)
Between \$25,000 to \$50,000	143 (31.7%)	255 (35.1%)
More than \$50,000	143 (31.7%)	304 (41.9%)
Urbanicity		
Rural	36 (8.0%)	86 (11.8%)
Suburban	273 (60.5%)	407 (56.1%)
Urban	142 (31.5%)	233 (32.1%)

Note. SBMH = school-based mental health

Dependent Variables

Dependent variables were derived from the direct assessment and the teacher questionnaire that were considered as legitimate indicators of student academic achievement and behavioral outcomes. The final dependent variable pool consisted of four continuous academic achievement variables (i.e., letter-word identification, passage comprehension, calculation, and applied problem in math) and three behavioral variables (i.e., in-class behaviors, hyperactivity, and persistence).

Academic Achievement

Academic achievement was a latent variable represented by four observed variables: (a) Letter-word identification w-score, (b) passage comprehension w-score, (c) calculation w-score, and (d) applied problems w-score. Letter-word identification and passage comprehension measured reading achievement and calculation and applied problems measured mathematics achievement. These performances were measured using four subtests from the *Woodcock-Johnson III* test (*Research Edition*), which is a standardized assessment that is age independent. W scores were used because they have an equal-interval scale for direct comparison and operation. For the current study, the average Cronbach's α across four tests and three time points was .957.

Behavior

Behavior was a latent variable that was represented by three observed variables in teacher interview. The three observed variables were: (a) In-class behaviors (Cronbach's $\alpha = .616$ across three waves). This variable assessed the frequency a child followed directions and completed homework on time. This was a numerical variable on a 2 to 6 scale (2 = very often, 6 = never). This variable was reverse coded so that higher scores meant better in-class behavior. (b) Hyperactivity (Cronbach's $\alpha = .720$ across three waves). This variable assessed the frequency a child transitioned easily from one class activity to another, went distracted, and acted impulsively. This was a numerical variable on a 3 to 9 scale (3 = never, 9 = very often). This variable was reverse coded so that higher score meant better behavior and less hyperactive. (c) Persistence (Cronbach's α

= .664 across three waves). This variable measured the frequency a child followed directions, received criticism well, performed to his or her ability, did things even if they were hard, kept at a task until finished, and communicated thoughts or ideas. This was a numerical variable on a 6 to 18 scale (6 = never, 18 = very often).

Independent Variables

School-Based Mental Health Service (SBMH)

SBMH services included mental health services, personal/group counseling, therapy, psychiatric care, behavioral intervention, behavior management program, and social work services. This variable was derived from the question “*Number of social adjustment supports*” in the school program questionnaires. When a school provided this information only at one or two waves and the responses were 0, then the school was coded as 0, suggesting that no social adjustment supports was provided to students. If the response included at least one non-zero number across three waves, then this school was coded as 1, indicating that the school provides social adjustment supports.

Gender

Information on participant gender was derived from parent interview. Male was coded as 1 and female as 2.

Ethnicity

Participants in the original dataset were classified as white, African American, Hispanic, Asian/Pacific Islander, American Indian/Alaska Native, and multi/other. Participants with the ethnicity of African American, Asian/Pacific Islander, American

Indian/Alaska Native, and multi/other nationalities were regrouped together and labeled as “*minority*”. White and minority ethnicity were coded as 1 and 2 respectively.

Disability

The original dataset included 12 types of disabilities. Based on the classification of the U.S. Department of Education, these 12 categories of disabilities were grouped as low- and high-incidence disabilities. Specifically, low-incidence disabilities included mental retardation, hearing impairments, orthopedic impairments, visual impairments, deaf-blindness, deafness, other health impairments, traumatic brain injury, autism, and multiple disabilities. High-incidence disabilities included speech and language impairment, learning disabilities, and emotional disturbance. Low-incidence disabilities was coded as 1 and high-incidence disabilities was coded as 2.

Suspension Level

The severity of behavior/mental health problems was represented by the total number of school suspension/expulsions. This variable was derived from the school characteristics questionnaire. Participants whose total suspension number lied in the lower 27% (from 1 to 10 numbers suspensions), middle 46% (from 11 to 83 numbers suspensions), and upper 27% (from 84 to 911 numbers of suspensions) were coded as 1, 2, and 3 that represented low, medium, and high levels of suspension respectively.

Socioeconomic Status (SES)

SES was measured by household income. Household income of less than \$20,000 was labeled as low SES and coded as 1. Household income between \$20,000 and

\$50,000 was labeled as medium SES and coded as 2. Household income of more than \$50,000 was labeled as high SES and coded as 3.

Urbanicity

Participants living in rural, suburb, and urban areas were coded as 1, 2, and 3 respectively.

Model Specification

The current trend for SBMH consists of the promotion of both academic achievement and behavioral health (Fabiano, Chafouleas, Weist, Sumi, & Humphrey, 2014). Based on this concept and previous research findings, SBMH was set to freely predict the slopes of academic achievement and behaviors. Moreover, according to convention, students with bad initial academic performance or behaviors were more likely to be referred to and thus receive SBMH services. Therefore, SBMH was also set to freely estimate the intercepts of academic achievement and behaviors. For the structural model between academic achievement and behaviors, because behaviors used in the current study were academic-related behaviors (e.g., following directions, completing homework, and performing to one's ability), and because these behaviors were acknowledged as predictors of better academic performance (Wentzel, 1993), intercepts and slopes of behaviors were set to freely predict those of academic achievement, instead of the vice versa. Two more structural paths were set for free estimation. One was from behavior intercept to academic slope, the other is from academic intercept to behavior slope, in that previous research indicated this

bidirectional relationship between behavior and academic performance (Conard, 2006; McEvoy & Welker, 2000). At the same time, to partial out the effects of SBMH on academic achievement and behaviors, the effects of gender, ethnicity, disability, suspension level, SES, and urbanicity were controlled. See the configural model in Figure 1 for a description of the model specified in this section.

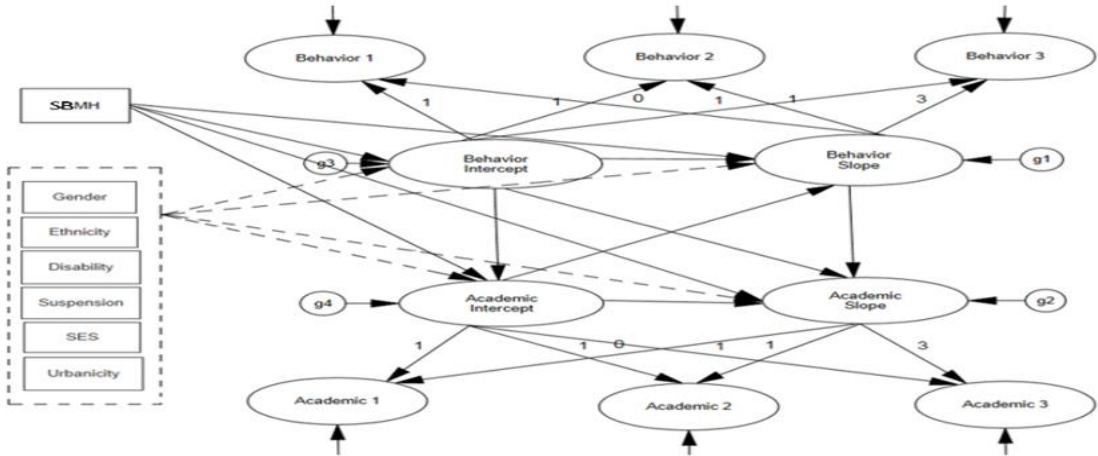


Figure 1. Configural model.

Data Analysis

Latent growth curve modeling (LGC) was used to test the hypothesis of the current study. Amos version 22 (Muthen & Muthen, 1998-2010) was used for all analyses. Missing data were handled with maximum likelihood estimates in Amos (Byrne, 2013).

Four steps were conducted when testing study hypotheses. First, univariate growth curve analyses were conducted to test the measurement model for each latent constructs and the intercept and slope for academic achievement and behavior. The purpose of this

step was to examine the model fit of latent variables to the observed variables as well as the growth trajectory of academic achievement and behavior. Models in Figures 2 and 3 represent this step.

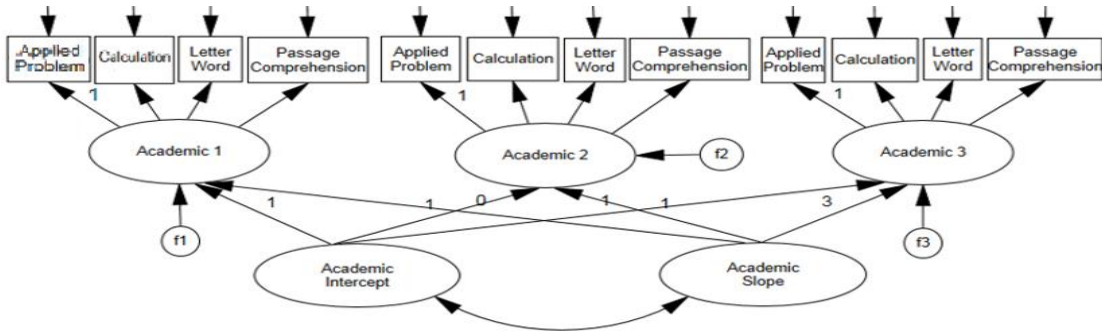


Figure 2. Academic growth model.

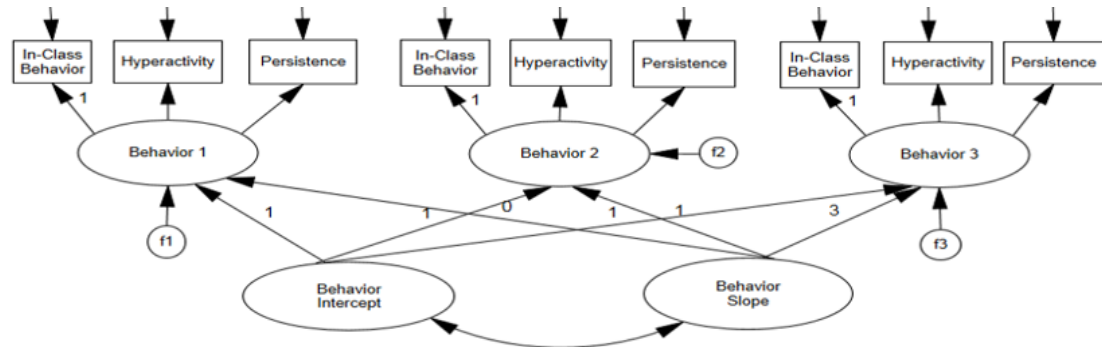


Figure 3. Behavior growth model.

Second, the multivariate model including the two longitudinal variables for academic achievement and behavior was tested. This multivariate model examined to which extent the initial level and the growth trajectory of behavior predicted the change of academic achievement over time, as well as how the initial level of academic

achievement predicted the trajectory of behavior over time. Figure 4 depicts the multivariate model in the second step.

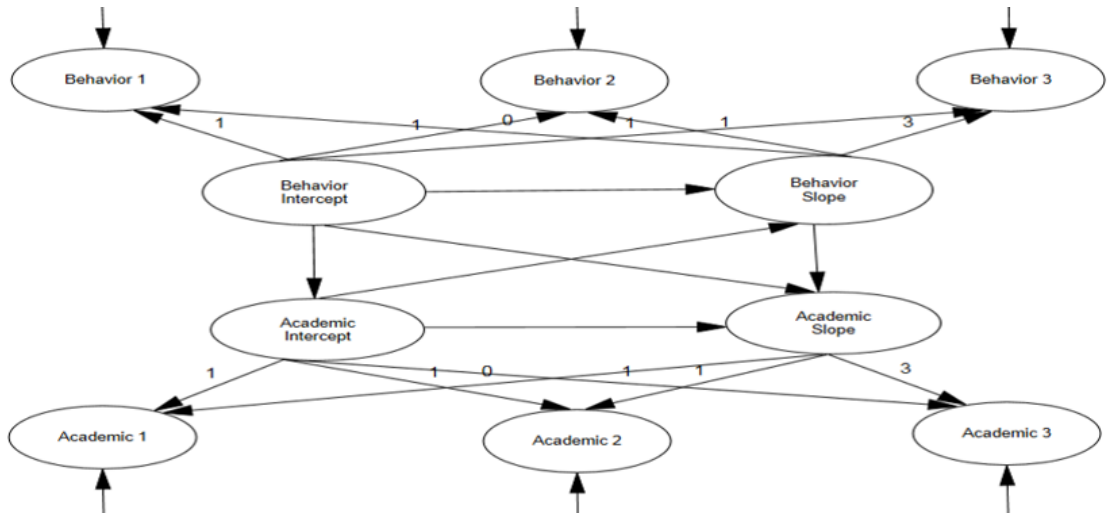


Figure 4. Multivariate growth model.

Third, the categorical variable SBMH was added to the multivariate model in the second step as an exogenous variable to predict the initial level and trajectory of academic achievement and behavior. This model was used as the configural model for the following multiple group analyses and is depicted in Figure 1. Finally, six multiple group analyses were conducted for gender, ethnicity, disability, suspension level, SES, and urbanicity respectively to test the different effects of SBMH based on these moderators.

Results

LGC Modeling Linking Academic Achievement and Behavior

Univariate Growth Curves

The analysis began with the univariate growth curves to test the measurement model for the latent growth constructs of academic achievement and behavior. The latent growth model consisted of the two latent variables, which were intercept and slope. Factor loadings for all the indicators for intercept were fixed to 1, and factor loadings for the three indicators for slope were set to 0, 1, 3, reflecting the time interval between three measurement points (i.e., year 1, 2 and 4).

Factor loadings for the measurement model for academic achievement and behavior at each assessment wave are presented in Figures 5 and 6. Results indicated that all the indicators loaded significantly on the latent variables at p level of .001. Results for the univariate growth models for academic achievement and behavior are presented in Table 2. The linear growth curve model for academic achievement across three waves showed acceptable fit of data, with $X^2(19) = 108.60$ ($p = .000$), CFI = .994, and RMSEA = .063 ($CI = .052$ to $.075$). The mean academic score at Wave 1 was 479.64, with statistically significant variance among individuals. The average increase of academic achievement across three waves was 5.43, with a significant variance among individuals. The growth curve for behavior showed good model fit, with $X^2(24) = 65.95$ ($p = .000$), CFI = .990, and RMSEA = .039 ($CI = .028$ to $.050$). The mean initial behavior score was 4.81, with a significant variance among individuals. The mean change of behavior was .002 and was

not statistically significant, indicating that on average, student behavior did not improve across three waves. However, the variance of the slope was statistically significant, suggesting the substantial variability among individual slopes, in which the number of students whose positive behavior increased was approximately equal to the number whose positive behavior decreased.

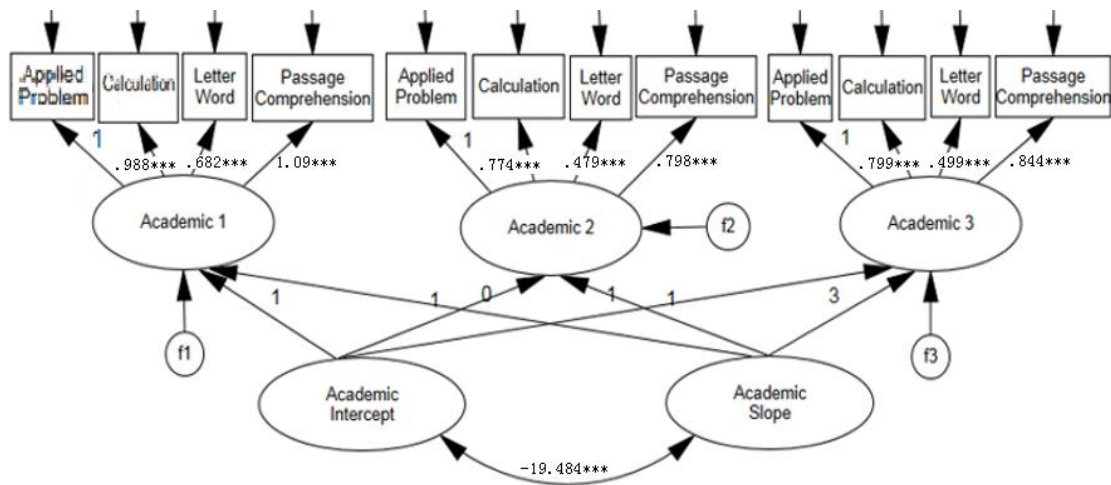


Figure 5. Results for academic growth model.

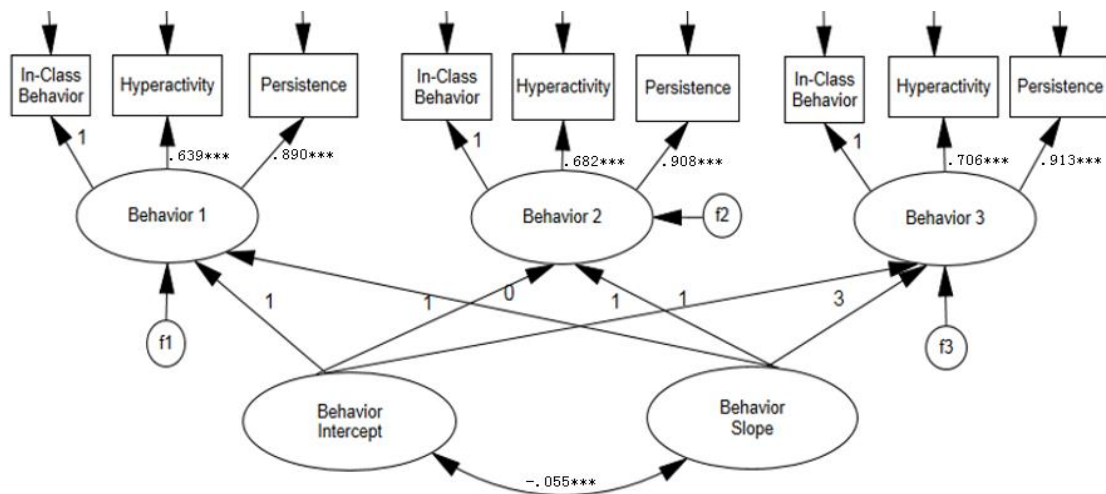


Figure 6. Results for behavior growth model.

Table 2
Results for Univariate Growth Curve Models

	Model fit index	Intercept (Variance)	Slope (Variance)
Academic achievement	$X^2 = 108.60, df = 19, p = .000$ CFI = .994 RMSEA = .063 (CI = .052; .075)	479.64***(640.45***)	5.43***(60.36***)
Behavior	$X^2 = 65.95, df = 24, p = .000$ CFI = .990 RMSEA = .039 (CI = .028; .050)	4.81***(.43***)	.002(.05***)

Note. CFI = comparative fit index; RMSEA = root mean square error of approximation; CI = confidence interval.

* $p < .05$; ** $p < .01$; *** $p < .001$

Multivariate Model

The multivariate model examined four causal relations: initial level of behavior to the initial level of academic achievement, the initial level of behavior to academic achievement change, the initial level of academic achievement to behavior change, and the change of behavior to academic change over time. The multivariate model showed good model fit, with $X^2(153) = 525.972$ ($p = .000$), CFI = .980, and RMSEA = .046 (CI = .041 to .050). Results of standardized path coefficients are presented in Figure 7. The statistically significant coefficients suggested that higher initial positive behavior could predict the higher initial academic score ($\beta = .144, p < .000$) and the faster improvement of academic achievement over time ($\beta = .120, p = .016$), the higher of initial academic score could also predict the faster increase of positive behavior over time ($\beta = .137, p < .000$), but the increase of positive behavior over time could not predict the change in academic achievement across three waves.

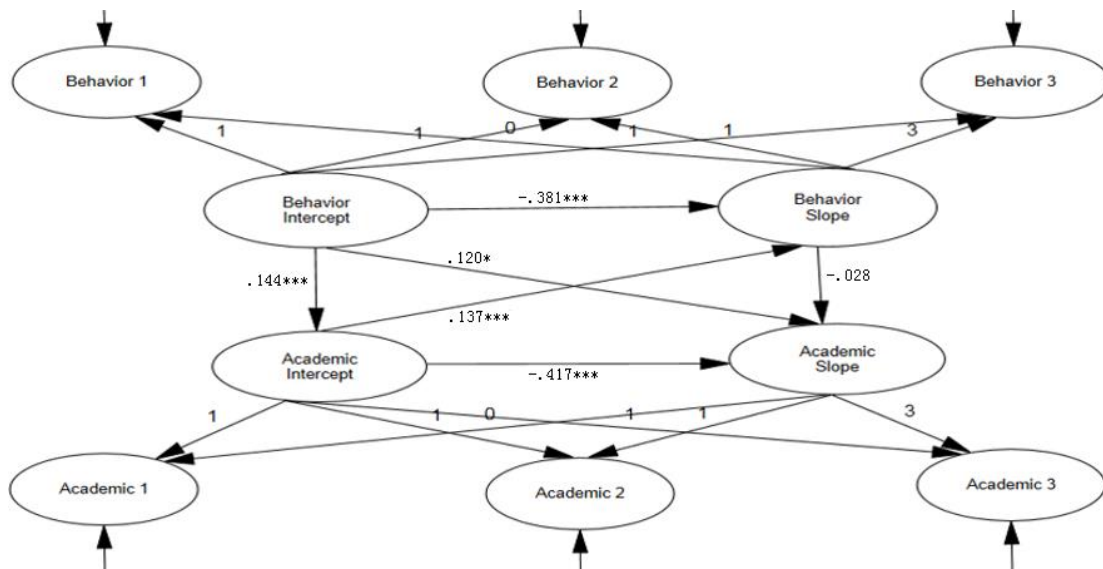


Figure 7. Results for multivariate model.

Effects of SBMH on Behavior and Academic Achievement (Configural Model)

The categorical variable *SBMH* was added to the multivariate model as an exogenous variable to predict the effects of SBMH on the initial levels as well as the changes of academic achievement and behavior. At the same time, *gender*, *ethnicity*, *disability*, *suspension severity*, *SES*, and *urbanicity* were added in the model as covariates to control the effects of these variables. Results indicated good model fit, with $X^2(272) = 855.060$ ($p = .000$), $CFI = .970$, and $RMSEA = .043$ ($CI = .040; .047$). Figure 8 shows the path coefficients of SBMH on the intercepts and slopes of academic achievement and positive behavior. Results indicated that the magnitude and direction of the statistically significant path coefficients found in the multivariate model in Figure 7 remained. For the effects of SBMH, controlling the effects of a series of covariates,

SBMH predicted a faster increase of academic achievement ($\beta = .086, p = .041$).

Therefore, students who ever received SBMH services had a faster rate of increase in academic achievement than those who did not receive these services over five years.

However, SBMH did not significantly affect the change of positive behavior ($\beta = -.082, p = .097$).

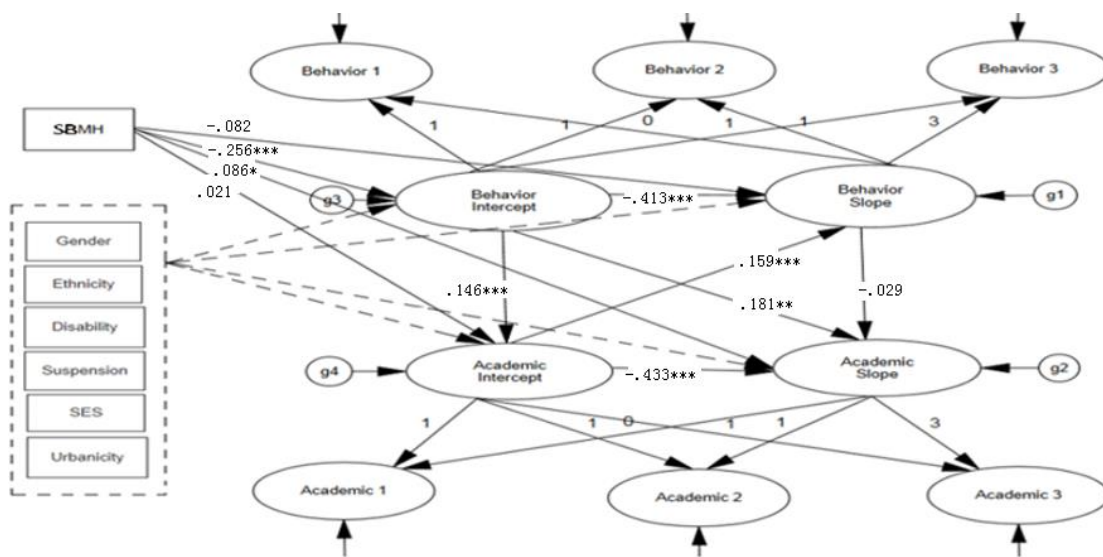


Figure 8. Results for configural model.

Moderation Effects of Gender, Ethnicity, Disability, Suspension Severity, SES, and Urbanicity

Gender, ethnicity, disability, suspension severity, SES, and urbanicity were used as moderators to test the invariance for the configural model depicts in Figure 1. Multiple group analyses were used to test each moderator independently. Three steps were conducted for each multiple group analysis. Take gender for example. First, all factor

loadings in the configural model (Figure 1) were constrained to be invariant for both gender groups and the difference between chi-square statistic for the constrained and freely estimated models were compared. Second, all path coefficients in the configural model were constrained to be invariant across gender groups and the chi-square difference statistic was calculated. Finally, if chi-square difference statistic indicated significant differences in the factor loadings or path coefficients across gender groups, then either or both of these coefficients were estimated independently for each gender group.

Gender Differences

Model fit for gender groups was good ($X^2(518) = 1083.391, p = .000$; CFI = .971, RMSEA = .030). Table 3 shows the path coefficients for both gender groups. Male and female participants who received SBMH had worse initial behavior ratings than those who did not receive SBMH ($\beta_{\text{male}} = -.282, p < .000$; $\beta_{\text{female}} = -.231, p < .000$). For both male and female sample, initial positive behaviors could positively predict initial academic achievement ($\beta_{\text{male}} = .097, p < .05$; $\beta_{\text{female}} = .270, p < .000$). There were two differences between boys and girls. First, behavior intercept could positively predict academic slope only for girls ($\beta_{\text{male}} = .124, p = .086$; $\beta_{\text{female}} = .349, p < .000$), indicating that girls who had a better initial behavior would have a faster improvement in academic achievement over time. Second, academic intercept could positively predict behavior slope only for boys ($\beta_{\text{male}} = .168, p < .01$; $\beta_{\text{female}} = .144, p = .065$), suggesting that boys

who had higher initial academic achievement demonstrated faster increase of behavior over time.

Table 3
Standardized Coefficients of Multiple Group Analysis Results for Gender

	Male	Female
SBMH → Behavior Intercept	-.282***	-.231***
SBMH → Behavior Slope	-.091	-.027
SBMH → Academic Intercept	.019	.011
SBMH → Academic Slope	.068	.126
Behavior Intercept → Academic Intercept	.097*	.270***
Behavior Intercept → Academic Slope	.124	.349***
Academic Intercept → Behavior Slope	.168**	.144
Behavior Slope → Academic Slope	-.045	.028
Academic Intercept → Academic Slope	-.444***	-.502***
Behavior Intercept → Behavior Slope	-.300***	-.517***

Values in bold and italic indicates differences between groups.

* $p < .05$; ** $p < .01$; *** $p < .001$

Ethnicity Differences

Model fit for ethnicity groups was good ($X^2(518) = 1136.417, p = .000$; CFI = .968, RMSEA = .032). Table 4 shows the path coefficients for the two ethnicity groups. The two groups showed differences in two primary ways: (a) Behavior intercept positively predict academic intercept for white participants ($\beta_{\text{white}} = .171, p < .001$) rather than minority participants. (d) Academic intercept positively predict behavior slope for white participants ($\beta_{\text{white}} = .715, p < .05$) rather than the other group.

Table 4

Standardized Coefficients of Multiple Group Analyses Results for Ethnicity

	White	Minority
SBMH → Behavior Intercept	-.29***	-.602*
SBMH → Behavior Slope	.056	.005
SBMH → Academic Intercept	.032	-.046
SBMH → Academic Slope	.017	.286
Behavior Intercept → Academic Intercept	.171***	-.051
Behavior Intercept → Academic Slope	1.34	.227
Academic Intercept → Behavior Slope	.715*	.096
Behavior Slope → Academic Slope	1.53	-1.03
Academic Intercept → Academic Slope	-1.62	-.019
Behavior Intercept → Behavior Slope	-.722	.052

Values in bold and italic indicates differences between groups.

* $p < .05$; ** $p < .01$; *** $p < .001$

Disability Differences

Model fit for disability groups was good ($X^2(518) = 1059.542, p = .000$; CFI = .971, and RMSEA = .030). Table 5 shows path coefficients for the two disability groups.

Participants with low- and high-incidence disabilities who received SBMH had worse initial behavior ratings than those who did not receive SBMH ($\beta_{\text{low-incidence}} = -.201, p < .000$; $\beta_{\text{high-incidence}} = -.397, p < .000$). The two groups were different in four ways. (a) SBMH positively predicted academic slope for low-incidence disability group ($\beta_{\text{low-incidence}} = .106, p < .05$), indicating that students with low-incidence disabilities, such as autism, who received SBMH had a faster increase of academic achievement than those who did not receive SBMH. (b) Behavior intercept positively predicted academic intercept only for students with low-incidence disabilities ($\beta_{\text{low-incidence}} = .151, p < .001$), suggesting that students with better initial behaviors also had higher initial academic achievement. (c) Academic intercept positively predicted behavior slope only for students with low-incidence disabilities ($\beta_{\text{low-incidence}} = .106, p < .0$), indicating that when

students had good initial academic performance, their behavior improved faster over time. (d) Behavior intercept positively predicted academic slope only for students with high-incidence disabilities ($\beta_{\text{high-incidence}} = .357, p < .05$), indicating that when students had good initial behaviors, their academic achievement increased faster over time.

Table 5
Standardized Coefficients of Multiple Group Analyses Results for Disability

	Low-incidence	High-incidence
SBMH → Behavior Intercept	-.201***	-.397***
SBMH → Behavior Slope	-.076	-.106
SBMH → Academic Intercept	.019	.034
SBMH → Academic Slope	.106*	.055
Behavior Intercept → Academic Intercept	.151***	.138
Behavior Intercept → Academic Slope	.124	.357*
Academic Intercept → Behavior Slope	.173**	.054
Behavior Slope → Academic Slope	-.048	.169
Academic Intercept → Academic Slope	-.432***	-.584***
Behavior Intercept → Behavior Slope	-.341**	-.624***

Values in bold and illicit indicates differences between groups.

* $p < .05$; ** $p < .01$; *** $p < .001$

Suspension Level Differences

Model fit for suspension groups was good ($X^2(765) = 1372.597, p = .000$; CFI = .969, and RMSEA = .026). Table 6 shows the path coefficients for the three suspension groups. Same as gender and disability groups, receiving of SBMH predicted worse initial behavior ratings for students with different suspension histories ($\beta_{\text{low suspension}} = -.367, p < .000$; $\beta_{\text{medium suspension}} = -.242, p < .001$; $\beta_{\text{high suspension}} = -.190, p < .01$). Two primary differences were found among the three groups. (a) Behavior intercept positively predicted academic intercept only for students with medium to high suspension levels ($\beta_{\text{medium suspension}} = .186, p < .001$; $\beta_{\text{high suspension}} = .152, p < .05$). (b)

Academic intercept positively predicted behavior slope only for students with medium suspension level ($\beta_{\text{medium suspension}} = 2.440, p < .05$).

Table 6

Standardized Coefficients of Multiple Group Analyses Results for Suspension Level

	Low Suspension	Medium Suspension	High Suspension
SBMH → Behavior Intercept	-.367***	-.242***	-.190**
SBMH → Behavior Slope	-.135	.101	-.068
SBMH → Academic Intercept	.072	-.004	.021
SBMH → Academic Slope	.082	.095	-.005
Behavior Intercept → Academic Intercept	.090	.186***	.152*
Behavior Intercept → Academic Slope	.155	.337	.260
Academic Intercept → Behavior Slope	.122	2.440*	.175
Behavior Slope → Academic Slope	.097	.532	-.012
Academic Intercept → Academic Slope	-.531***	-1.793	-.258
Behavior Intercept → Behavior Slope	-.521***	-.091	-.418*

Values in bold and italic indicates differences between groups.

* $p < .05$; ** $p < .01$; *** $p < .001$

SES Differences

Model fit for SES groups was good ($X^2(777) = 1404.727, p = .000$; CFI = .967, and RMSEA = .026). Table 7 shows the path coefficients for the three SES groups. Same as gender, disability, and suspension groups, involvement in SBMH services predicted initial worse behavior ratings for all three SES groups ($\beta_{\text{low SES}} = -.324, p < .001$; $\beta_{\text{medium SES}} = -.171, p < .01$; $\beta_{\text{high SES}} = -.297, p < .001$). Five primary differences existed among the three SES groups. (a) Students with low SES who received SBMH had faster academic improvement over time ($\beta_{\text{low SES}} = .136, p < .05$). (b) Students with medium SES who participated SBMH had slower behavior improvement over time ($\beta_{\text{medium SES}} = -.206, p < .01$). (c) Behavior intercept positively predicted academic slope only for students with low SES ($\beta_{\text{low SES}} = .322, p < .01$). (d) Behavior intercept positively

predicted academic intercept only for students with medium to high SES ($\beta_{\text{medium SES}} = .117, p < .05; \beta_{\text{high SES}} = .195, p < .001$). (e) Academic intercept positively predicted behavior slope only for students with medium to high SES ($\beta_{\text{medium SES}} = .206, p < .01; \beta_{\text{high SES}} = .143, p < .05$).

Table 7
Standardized Coefficients of Multiple Group Analyses Results for SES

	Low SES	Medium SES	High SES
SBMH → Behavior Intercept	-.324***	-.171**	-.297***
SBMH → Behavior Slope	-.001	-.206**	.076
SBMH → Academic Intercept	.041	-.013	.068
SBMH → Academic Slope	.136*	.094	.085
Behavior Intercept → Academic Intercept	.149	.117*	.195***
Behavior Intercept → Academic Slope	.322**	.103	.123
Academic Intercept → Behavior Slope	.041	.206**	.143*
Behavior Slope → Academic Slope	-.084	-.038	-.105
Academic Intercept → Academic Slope	-.266***	-.834***	-.462***
Behavior Intercept → Behavior Slope	-.143	-.550***	-.377**

Values in bold and illicit indicates differences between groups.

* $p < .05$; ** $p < .01$; *** $p < .001$

Urbanicity Differences

Model fit for urbanicity groups was good ($X^2(777) = 1509.553, p = .000$; CFI = .963, and RMSEA = .026). Table 8 shows the path coefficients for the three urbanicity groups. Same as gender, disability, suspension, and SES groups, receiving of SBMH services predicted initial worse behavior ratings for all three urbanicity groups ($\beta_{\text{rural}} = -.385, p < .001; \beta_{\text{suburban}} = -.274, p < .001; \beta_{\text{urban}} = -.184, p < .01$). Five primary differences were found among the three groups. (a) Students residing in urban area who received SBMH had faster academic improvement over time ($\beta_{\text{urban}} = .288, p < .01$). (b) Students living in rural area who participated SBMH had slower behavior improvement

over time ($\beta_{\text{rural}} = -.448, p < .01$). (c) Behavior intercept positively predicted academic slope only for students living in rural area ($\beta_{\text{rural}} = .389, p < .05$). (d) Behavior intercept positively predicted academic intercept only for students in suburban area ($\beta_{\text{suburban}} = .194, p < .001$). (e) Academic intercept positively predicted behavior slope only for students living urban area ($\beta_{\text{urban}} = .227, p < .001$).

Table 8
Standardized Coefficients of Multiple Group Analyses Results for Urbanicity

	Rural	Suburban	Urban
SBMH → Behavior Intercept	-.385***	-.274***	-.184**
SBMH → Behavior Slope	-.448**	-.226	.047
SBMH → Academic Intercept	-.009	.059	-.037
SBMH → Academic Slope	.231	.391	.288**
Behavior Intercept → Academic Intercept	.178	.194***	.084
Behavior Intercept → Academic Slope	.389*	2.022	.231
Academic Intercept → Behavior Slope	-.028	.428	.227***
Behavior Slope → Academic Slope	.270	1.591	.026
Academic Intercept → Academic Slope	-.253*	-1.163	-.469**
Behavior Intercept → Behavior Slope	-.642**	-1.141	-.355**

Values in bold and illicit indicate differences between groups.

* $p < .05$; ** $p < .01$; *** $p < .001$

Results Summary

Five primary results were found for the current study. Standardized path coefficients in Figure 8 shows the overall effects of SBMH controlling for a series of covariates, specifically, (a) SBMH positively predicted academic slope and (b) SBMH negatively predicted behavior intercept. Standardized coefficients in Tables 4 to 9 demonstrate moderation effects of student characteristics, specifically, (c) behavior intercept positively predicted academic intercept for male, female, white, low-incidence disabilities, medium and high suspension, medium and high SES, and suburban students;

(d) behavior intercept positively predict academic slope for female, high-incidence disabilities, low SES, and rural students; and (e) academic intercept positively predicted behavior slope for male, white, low-incidence disabilities, medium suspension, medium and high SES, and urban students.

Discussion

The goal of the current study was to investigate the effects of SBMH on academic achievement and behaviors over time for students diagnosed with disabilities using latent growth curve modeling. Results indicated that SBMH predicted faster improvement of academic performance and confirmed the bidirectional relationship between behavior and academic achievement. Moreover, these findings varied depending on participant characteristics.

Interpretation of Findings

Academic and Behavioral Growth

The current study found that academic achievement for students with disabilities significantly increased over time and this phenomenon cannot be attributed only to natural progress because both experimental and control groups improved significantly in academic achievement, but participants received SBMH outperformed those in the control group. It was also found that behaviors did not improve significantly over the 3 data collection waves. The reason might be that problem behaviors of participants included in the current study were so severe that all participants had at least one school suspension/expulsion experience. Therefore, even though time passed and SBMH

supports were received, some participants' behaviors were so severe that they did not improve or even regressed, and thus leveled the average progress rate for all participants.

Initial Behavior Performance and SBMH

Reception of SBMH predicted worse initial behaviors but not academic performance. In other words, problem behaviors resulted in the reception of SBMH interventions, but academic difficulties did not incur such services. This phenomenon reflects literature findings that the majority of mental health services focused on mental health symptoms and behavioral outcomes rather than educational outcomes (Suldo, Gormley, DuPaul, & Anderson-Butcher, 2014). Compared to measures of typical mental health outcomes, there is a paucity of research that examined the effectiveness of mental health interventions on educational outcomes (Hoagwood et al., 2007), not to mention educational outcomes for youth with disabilities. Lyon et al. (2014) interviewed school mental health experts and stakeholders on how to best design an effective mental health intervention so that it could integrate into the school context. The authors found that the key component for integration was an explicit focus on educational outcomes. Therefore, to smooth the movement of evidence-based mental health interventions to school settings, evidence of treatment effectiveness on academic outcomes is important. Furthermore, educational outcomes, such as academic achievement, can be used as one indicator for referral of SBMH services.

Academic Achievement and SBMH

Findings from the current study provided preliminary evidence that mental health interventions fastened academic improvement for students with disabilities. This finding is consistent with results from previous meta-analyses indicating the positive effects of SBMH on educational outcomes for normally developed youth (Becker et al., 2014; Baskin et al., 2010; Prout & DeMartino, 1986). For students with disabilities, mental health services might be a potentially important path for them to gain access to instructional opportunities and improve their academic proficiency.

This effect was most significant for students from low SES families and urban areas. Congruent with previous research, children in the urban area and low-income families suffered from poverty and some of the ravages were academic performance and behavior problems (Gottlieb, Alter, Gottlieb, & Wishner, 1994; Grant et al., 2004). Analysis from the current study found that students living under these conditions had the lowest scores on academic achievement tests as well as behavioral ratings compared to students from middle to high socioeconomic families or from suburban/rural areas. Farahmand, Grant, Polo, Duffy, and Dubois (2011) conducted a meta-analysis investigating SBMH programs for students from low-income urban areas and found positive effects on academic outcomes ($ES = .24$). The current study found similar results for disabled youths from a similar background, but not for disabled youths from the high-income background. This finding suggests that academic achievement for students from low-income families might be more sensitive to and thus benefit more from mental health

services than their counterparts from better socioeconomic families. Therefore, when carrying out academic interventions in school settings, mental health services could be considered for students from low-income families, not only because the positive effects on academic achievement found from the current and previous studies, but also because of the additional social-emotional and behavioral merits that cannot be achieved by merely implementing academic interventions.

Furthermore, the current study found that the positive effects of SBMH on academic achievement was most significant for students with low-incidence disabilities, such as intellectual disability, ADHD, or autism. This finding was consistent with some previous studies (e.g., Eikeseth, Smith, Jahr, & Eldevik, 2002; Loe & Feldman, 2007; Raggi & Chonis, 2006). For example, Fabiano et al. (2009) reported a meta-analysis on the effectiveness of behavioral treatments for youth with ADHD and found an ES of .32 for academic testing scores. However, literature also indicated the positive effects of mental health services for youth with high-incidence disabilities. For example, Beauchemin, Hutchins, and Patterson (2008) found that a mindfulness intervention with adolescents with LD helped improve academic performance as measured by teacher report questionnaire. It is not clear why the current study found stronger effects for low-incidence disabilities. Two potential explanations are provided. One is that students with high-incidence disabilities, such as LD and EBD, perceived school settings as more dangerous and were less attached to schools (Furrer & Skinner, 2003). Therefore, school-based interventions might have less effectiveness to these students if they do not

willingly engage in these interventions. The other explanation is that the current study included an uneven number of students with low-incidence ($n = 883$) and high-incidence disabilities ($n = 294$) and that most of the low-incidence disabled youth happened to be sensitive to SBMH interventions, therefore resulting in larger effects than those with high-incidence disabilities.

Behavior Performance and SBMH

Contrary to assumption and most previous studies investigating the effects of SBMH on behavioral outcomes, the current study did not find statistically significant positive effects. What is more, significant negative effects were even found for some subgroups, including youth from medium-SES and rural families. Although these findings were contrasted to the convention and rare relative to studies found positive behavioral effects, they are not totally alone. For example, peer-group interventions have been found to have long-term negative effects on adolescent substance abuse, externalizing behaviors, and delinquency (Dishion, Poulin, & Burraston, 2001; Dishion, Capaldi, Spracklen, & Li, 1995; McCord, 1978). The authors attributed to these results to the reinforcement effects of repeated contact with deviant youth within the peer-group on deviant talk and behavior during the intervention (Dishion, McCord, Poulin, 1999). Participants in the current study were those with at least one school suspension experience, suggesting that all of them had severe problem behaviors. Therefore, if programs, such as peer-group interventions, were implemented in their schools, negative effects on behavior development are anticipatable. Hundert et al. (1999) examined the

effects of school-based programs for maladjustment behaviors for elementary-age children over five years. Results indicated worsening observed behaviors on the playground and teacher-rated externalizing problems for two of the three programs. A recent study conducted by Stein et al. (2003) investigated a cognitive-behavioral therapy for middle school students at risk for posttraumatic stress disorder and found that the intervention did not show significant effects on teacher-reported externalizing and internalizing problems. Researchers attributed these negative results to short intervention period, the non-alignment between intervention goals and outcome measures, and the discrepancy between raters. In addition to the reasons provided above, poor implementation quality in school settings may also lead to the non-significant to negative effects found in the current study (Langley, Nadeem, Kataoka, Stein, & Jaycox, 2010). Participants in the current study received school-based interventions, even if these interventions were found efficacious in highly controlled settings, such as clinics, due to the complexity of school contexts, interventions might be found ineffective. Without more information about the interventions delivered to participants in the current study, little conclusion could be drawn about why a non-significant to negative effects were found in student behaviors.

Relationship between Behavior and Academic Achievement

Results of the current study confirmed the bidirectional relationship between behavior and academic success, in which the initial level of behavioral performance predicted the initial level of academic achievement and the rate of academic

improvement; in turn, the initial level of academic achievement predicted the improvement of behavioral performance over time. Abundant empirical evidence has found this relationship in normally developed youth (e.g., Campo, Jansen-McWilliams, Comer, & Kelleher, 1999; Eggert, Thompson, Randell, & Pike, 2002; Roderick et al., 1997). Beuhring, Blum, and Rinehart (2000) analyzed data from the *Add Health Survey* of health-related behaviors in U.S. adolescents. The authors found that there was a universal association between academic difficulties and health risk behaviors, such as substance use, suicidal thoughts and attempts, violence, and sexual intercourse. Boyce et al. (2002) found that academic difficulties were reported to frequently precede the diagnosis of psychopathology in adolescents. Longitudinally, Masten et al., (2005) found that externalizing behaviors in elementary school predicted worse academic performance in high school years and late adolescence, which in turn predicted more internalizing symptoms in early adulthood. Although research has established the close associations between academic performance and behavior, few studies investigated the positive influence between these two constructs. Results from the current study inform the importance of targeting both behavior and academic outcomes in SBMH because the improvement of one construct promoted the improvement of the other, especially for students with disabilities.

The current study also found that the predictive relationship between behavior and academic achievement varied depending on participant characteristics. For example, behavior intercept was found to predict academic improvement for female but not for

male, and academic intercept predicted behavior development for male but not female. This finding indicated that girls' academic performance was influenced more by their behaviors and boys' behavior improvement depends more on their academic performance. These results have important practical implications for screening and intervention. For example, when screening for academic failure risks, behavior performance can be used as an indicator for girls. Similarly, when screening for behavior problems, academic performance can be used as an indicator for boys. Moreover, when teachers find boys develop problem behaviors, it is important to also check their academic performance to see if the problem behavior was a reflection of degradation in the study. If academic record confirms this assumption, then academic interventions might be more influential than simple behavior interventions. This principle applies to the differences found with other moderators in the current study, such as disability type and SES.

Limitations

Several limitations compromised findings from the current study. First, the SEES study is a large-scale research that involved students from different background with varying characteristics and measured a large amount of variables related to academic and behavioral outcomes. Despite SBMH services investigated in the current study, students also received other interventions, such as reading instruction and interventions based on their IEPs. Therefore, it is difficult to eliminate the effects of confounding variables on outcome measures in the current study. The current study tried to select homogeneous

participants based on their behavior performance, and this procedure decreased the variance among students and improved the trustworthiness of findings from the current analyses. Second, information of participation in SBMH was collected from parent interview by asking only one question to parents through phone calls. As shown in the data, some parents responded that their children received SBMH when schools did not even provide those services. Therefore, dependence on parent interview to classify participants into intervention group and control group may not be accurate due to the uncertainty of parent responses. To reduce consequences brought by this limitation, the current study screened parent responses against school responses on whether they provided SBMH supports so as to improve the accuracy of parent responses. Finally, no description of SBMH received by participants was provided. This constrained the generalizability of findings from the current study because readers would not know what type of programs to use for their students just based on the current findings. It is recommended that when information about SBMH program is collected in the future, it is important to ask more specifically about the programs so that results would have more guiding significance for school practitioners.

Implications

The proportion of children being diagnosed and treated for mental conditions is greater than ever before (Cuellar, 2015). The NCLB mandated that schools are accountable for all students AYP, including students with disabilities. Literature found

that students with mental health disorders underperformed academically (Burt & Roisman, 2010; Moilanen et al., 2010). The present study found that SBMH positively predicted disabled children's academic improvement, which is an inspiring finding in consideration of the traditional overlook of educational outcomes in mental health interventions. Future research is encouraged to include academic outcomes as one indicator of intervention effectiveness so that schools would be more supportive of SBMH services for students with disabilities in order to meet the accountability standards under NCLB. Although academic achievement was positively affected by SBMH, the current study found that academic difficulties could not guarantee for the reception of SBMH in that reception of SBMH did not predict worse academic achievement. Therefore, it is recommended that academic performance is used as one screening criteria for eligibility of SBMH services, especially for some subgroup students whose behavior development is predicted by their academic performance (e.g., male students).

The current study found that SBMH had varying effects based on participant characteristics. For example, SBMH services were found to be effective on academic achievement for low-incidence disabilities but not for high-incidence disabilities, or behavior intercept was found to predict academic slope for female but not male students. These varying effects indicate the complexity of SBMH for students with disabilities. More research is needed to test each of these varying effects both in highly controlled settings and in school environment so that reliable conclusions could be drawn to guide

school practices. Based on findings from the current study, when school personnel selects intervention programs, it is important to consider the characteristics of their students.

CHAPTER III

THE EFFECTIVENESS OF EVIDENCE-BASED SCHOOL MENTAL HEALTH PROGRAMS FOR STUDENTS WITH DISABILITIES: A META-ANALYSIS

Introduction

Mental health problems in children and adolescents constitute a rising nationwide and global issue. The World Health Organization estimated that mental health problems would become the primary cause of youth illness by the year 2020. In the United States, approximately 20-30% of children and adolescents have a diagnosable mental disorder (Roberts, Atkinson, & Rosenblatt, 1998); however, approximately 80% of these youth barely have their needs met (Kataoka, Zhang, & Wells, 2002). Left untreated, mental health problems can evolve into chronic diseases over an individual's lifespan. Research found that 73.9% of adult mental health problems had their diagnostic origin before the age of 18 and 50% had their origin before the age of 15 (Gregory et al., 2007; Kim-Cohen et al., 2003).

Mental Health Problems in Youth with Disabilities

Disability acts as a risk factor that increases the likelihood of developing mental health problems (Bruce, 2000). Literature found students with disabilities had more difficulties in academic, self-concept, social functioning, and social adjustment. For example, several researchers found hearing impairments, learning disabilities, and physical disabilities were associated with decreased social and academic competencies (Cambra & Silvestre, 2003; Jackson, Enright, & Murdock, 1987). Lowered social and

academic self-concept and self-esteem were detected in students with a wide variety of special education needs including hearing, motor, visual, learning, and intellectual disabilities (Cambra & Silvestre, 2003). Bossaert, Colpin, Pijl, and Petry (2013) found that children with autism spectrum disorders reported lower scores on social interactions, peer acceptance, friendships, and social contact than their normally developing peers and children with other types of disabilities. Students with learning disabilities and other physical disabilities enrolled in mainstream schools reported higher loneliness and lower satisfaction levels in peer relationships compared to non-disabled peers (Gresham & MacMillan, 1997; Margalit & Levin-Alyagon, 1994; Pavri & Luftig, 2001).

There is also theoretical and empirical evidence that supports the longitudinal linkage between childhood disability and mental health problems in adulthood (Latham, 2015). Cumulative inequality theory provides one possible explanation for this linkage. This theory posits that early disability onset (or childhood disability) leads to cumulative disadvantages and deficits in personal financial and social support. These cumulative inequality experiences cause worsening mental health conditions in people with disabilities over the long run (Ferraro, Shippee, & Schafer, 2009). A study conducted with Australian youth with disabilities or other health impairments found these young people had less access to social support, less contact with friends or family members, and were more likely to have financial hardship (Emerson, Honey, Madden, & Llewellyn, 2009). Previous research has found people with early disability onset experienced more secondary conditions, such as depression, than those with disabilities

onset in later life (Klingbeil, Baer, & Wilson, 2004; Thompson, 2004). The most recent study reported that participants with a disability before 16 years of age reported an average of .72 more depressive symptoms in late midlife than those without childhood disabilities (Latham, 2015).

Effects of School-Based Mental Health

So far, three meta-analyses have been conducted to investigate the effects of school-based mental health services. Prout and DeMartino (1986) conducted the first meta-analysis based on 33 studies (52 comparisons) published between 1962 and 1982. The overall Cohen's d across all treatment strategies was .58. Intervention strategies used in these 33 studies included relaxation/biofeedback, reinforcement, cognitive/rational, social skills/instructional, non-directive/client-centered, human relations/affective, and unclassified. Outcome measures consisted of self-concept/esteem, anxiety, observed behavior, cognitive skills/ability, problem-solving skills, and grade point average. Moderation analysis indicated that: (a) group interventions yielded larger effect size ($d = .72$) than individual interventions ($d = .39$), and that interventions used cognitive/rational strategies generated the largest effect size ($d = .86$) among all interventions. (b) Interventions yielded the strongest effects on observed behavior ($d = 1.25$) and problem-solving skills ($d = .94$), followed by grade point average ($d = .68$). (c) Secondary-age children ($d = .65$) had larger effect size than elementary-age children ($d = .52$). Conclusions from this meta-analysis acknowledged the benefits of psychotherapy in schools.

Prout and Prout (1998) reported an updated meta-analysis based on 17 studies from 1985 to 1994. Intervention strategies included CBT, relaxations, and skills training. Mental health problems consisted of depression, self-concept, social skills/status, anxiety, attitude, and performance. The authors found an overall effect size of .97. Although results from this study were impressive, the validity of the study was compromised due to the small sample size and the way that effect sizes were analyzed and reported (Baskin et al., 2010).

Baskin et al. (2010) conducted the latest meta-analysis on school mental health services for youth aged 5 to 18 years. Mental health problems included social skills deficit, acting-out behaviors, depression, school adjustment, trauma, anger issues, learning issues, generalized anxiety, family divorce or separation, and substance abuse issues. Intervention strategies consisted of behavioral therapy, CBT, interpersonal therapy, play therapy, psychoeducational counseling interventions, and other strategies, such as role-playing and biofeedback. One hundred thirty-two treatment interventions yielded an overall effect size of .45 ($CI_{95} = .37$ to $.53$). Moderation analyses based on participant characteristics (age, gender, and ethnicity) and intervention characteristics (therapist and treatment modality) indicated that adolescents experienced greater effects than children, interventions focused on one gender produced stronger effects than those focused on mixed gender, and licensed professionals performed the best and graduate students performed the worst as therapist.

Evidence-Based School Mental Health Interventions

School has become the primary setting for delivering mental health services for the majority of children who experience mental health problems (Burns et al., 1995). The call for the evaluation of the evidence base for mental health practices received keen interest when the President's New Freedom Commission on Mental Health emphasized the importance of identification of evidence-based mental health interventions in school settings (Hogan, 2003).

Several organizations evaluated currently implemented school-based mental health programs based on rigorous research standards. For example, the U.S. Department of Education (USDOE) considers a program as evidence-based if “two or more studies show statistically significant positive effects, at least one of which meets the What Works Clearinghouse group design standards without reservations, and no studies show statistically significant or substantively important negative effects” For Substance Abuse and Mental Health Services Administration (SAMHSA), a program has to meet three minimum requirements to be included. These requirements are “(a) research or evaluation of the intervention has assessed mental health or substance use outcomes among individuals, communities, or populations or other behavioral health-related outcomes on individuals, communities, or populations with or at risk of mental health issues or substance use problems; (b) evidence of these outcomes has been demonstrated in at least one study using an experimental or quasi-experimental design. Studies with single-group, pretest-post designs or single-group, longitudinal/multiple time series do

not meet this requirement; and (c) the results of these studies have been published in a peer-reviewed journal or other professional publication, or documented in a comprehensive evaluation report, published within the previous 25 years” For a program to be considered promising by Center for the Study and Prevention of Violence (CSVP), four criteria have to be met: “(a) the program description clearly identifies the outcome the program is designed to change, the specific risk and/or protective factors targeted to produce this change in outcome, the population for which it is intended, and how the components of the intervention work to produce this change; (b) a minimum of one high quality randomized control trial or two high-quality quasi-experimental evaluations; (c) the preponderance of evidence from the high quality evaluations indicates significant positive change in intended outcomes that can be attributed to the program and there is no evidence of harmful effects; and (d) the program is currently available for dissemination and has the necessary organizational capability, manuals, training, technical assistance and other support required for implementation with fidelity in communities and public service systems”.

Kutash, Duchnowski, and Lynn (2006) summarized 92 school-based programs that were identified as showing evidence base for treating mental health problems in children and adolescents and were ready for dissemination. These programs were identified by five organizations using rigorous appraisal criteria. The five organizations were SAMHSA, CSVP, USDOE, Prevention Research Center for the Promotion of Human Development at Penn State, and Collaborative for Academic, Social, and Emotional

Learning (CASEL). Programs listed in the Kutash et al. (2006) synthesis covered three prevention levels (i.e., universal, selective, and indicated) and two-thirds of these programs targeted on social-emotional and externalizing behavioral areas.

Mental Health Services for Youth with Disabilities

Even though mental health problems are ubiquitous in disabled youth and their impacts are not negligible, there is a dearth of research on services provided to youth with both disabilities and mental health problems (Hassiotis, Barron, & O'Hara, 2000). A frequency analysis of the nationally representative data from Special Education Elementary Longitudinal Study (SEELS) revealed approximately one in three children with any disability received some form of mental health services. However, the effects of most school efforts on mental health intervention are still unknown (Masia-Warner, Nangle, & Hansen, 2006).

Research Purpose

Numerous evidence-based interventions for mental health problems in general school population have been identified. However, there is a paucity of research literature focusing on the status of mental health services for students with disabilities (Rones & Hoagwood, 2000). No meta-analysis to date has investigated the efficacy of school-based mental health services for students with disabilities. In consideration of the substantial implementation cost and training efforts, it is important to determine if evidence-based interventions produce superior outcomes than other treatments or no treatment. The current study used meta-analysis to evaluate the efficacy of evidence-

based mental health programs used in school settings for students with disabilities so that future development of programs could be better informed. The current meta-analysis focused on academic performance, externalizing and internalizing behaviors, social skills, and social adjustment outcomes. Several research questions were proposed as follows:

1. What are the characteristics of participants and interventions of identified studies that focused on evidence-based school mental health programs for disabled youths?
2. What is the overall effect size of evidence-based school mental health interventions for students with disabilities?
3. What are the moderation effects of a cluster of moderators on the overall effect size? Moderators included participant age, participant nationality, control condition, target participants, intervention length, and implementation fidelity.

Method

Definition of Key Variables

The current study adapted Rones and Hoagwood (2000) definition of school-based mental health service for children with disabilities, which was “any program, intervention, or strategy applied in a school setting that was specifically designed to influence emotional, behavioral, or social functioning *for students with disabilities*” (p. 224). Service was defined to include prevention (universal level), risk reduction (selective level), and intervention/treatment (indicated level) (Rones & Hoagwood, 2000). The evidence-based intervention was defined as programs that have been

appraised as evidence-based interventions by federal agencies (Macklem, 2011).

Students with disabilities were school-aged children with disability diagnosis defined by the Individuals with Disabilities Education Act (IDEA).

Evidence-Based Mental Health Programs in Schools

The current meta-analysis only focused on mental health programs that have been identified as evidence-based and targeted academic behavior (e.g., academic engagement), externalizing and internalizing behaviors, social skills, and social adjustment. Programs that focused exclusively on drug use, alcohol, eating disorder, dating behavior, sexual behavior, and academic performance were beyond the focus of the current study.

Programs were selected based on two methods. First, the 92 programs summarized by Kutash et al. (2006) from the five aforementioned government agencies were included. This procedure yielded 43 programs focusing on the target outcome areas and could be implemented either in schools or both school and community settings. Programs that could only be implemented in the community were excluded.

Second, an updated search of SAMHSA, CSVP, USDOE, and CASEL were conducted for newly identified evidence-based interventions since the Kutash et al. (2006) synthesis. Advanced search method was used to narrow down the programs for the target problem areas and outcome categories. For SAMHSA, the areas of interest were mental health promotion and co-occurring disorders. Outcome categories were crime or delinquency, education, family/relationships, mental health, quality of life,

social functioning, suicide, trauma/injuries, treatment or recovery, and physical aggression and violence-related behavior. Age range spanned from 6 to 17 years and the setting was school. Ninety-one programs yielded and 42 newly identified programs were used for the current study. Programs that did not fit into the three-level prevention framework were excluded. For CSVP, searching restrictions were only set to age (5 to 18 years) and setting (school). Forty programs yield and 16 were used for the current study. For USDOE, search restriction was set to intervention report and studies showing positive or potentially positive effectiveness. The rating of effectiveness took into consideration of design quality, the statistical significance of findings, the difference between intervention and comparison groups, and finding consistency across studies. Twenty-eight interventions yielded and 4 were used for the current study. For CASEL, 25 programs were identified and 7 programs were included in the current study. Figure 9 depicts the procedure for program screening. This two steps yielded 109 evidence-based programs that demonstrated at least promising effects. Table 9 lists descriptions of these programs.

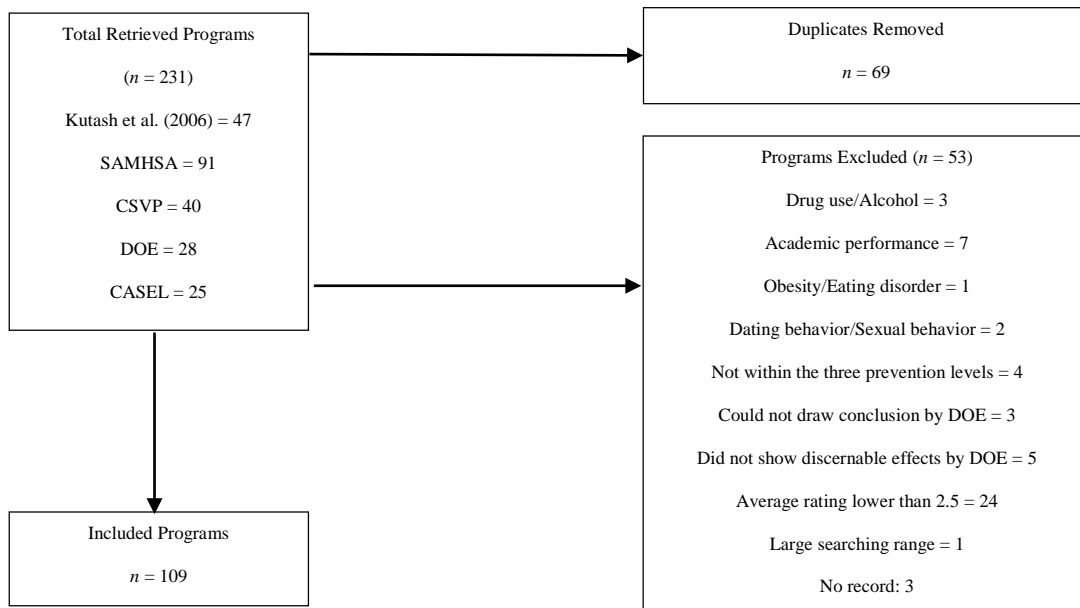


Figure 9. Screening procedure for evidence-based school mental health programs. SAMHSA = Substance Abuse and Mental Health Services Administration; CSVP = Center for the Study and Prevention of Violence Prevention; DOE = U.S. Department of Education; CASEL = Collaborative for Academic, Social, and Emotional Learning.

Table 9
Description of Evidence-Based Programs

	Program Name	Prevention Level	Age	Outcome Category	Setting
1	Achievement Mentoring (formerly Behavioral Monitoring and Reinforcement Program)	Selective	12-14	Academic; Behavior	School
2	Across Ages	Selective	9-13	Social/emotional	School; Community
3	Active Parenting (4th Edition)	Universal; Selective;	0-5; 6-12	Social functioning	Home; School; Community
4	Active Parenting of Teens: Families in Action	Indicated Universal; Selective;	6-12; 13-17	Social/emotional	Home; School; Community
5	Al's Pals: Kids Making Healthy Choices	Universal	0-5; 6-12	Social/emotional; Behavior	School; Community
6	AMIkids Personal Growth Model	Selective; Indicated	6-12; 13-17	Behavior; Academic	School; Home; Community
7	Anger Coping Program	indicated	9-12	Behavior	School; Community
8	Anti-Defamation League (ADL) Peer Training Program	Universal	13-17	Social/emotional	school
9	Athletes Training and Learning to Avoid Steroids (ATLAS)	Universal	15-18	Social/emotional	School

Table 9 Continued

	Program Name	Prevention Level	Age	Outcome Category	Setting
10	Attributional Intervention (Brainpower Program)	indicated	10-12	Behavior	School; Community
11	Blues Program (Cognitive Behavioral Group Depression Prevention)	Selective/Indicated	15-18	Depression	School
12	Body Project (Dissonance Intervention)	Selective	15-18	Social/emotional	School
13	Building Decision Skills	Universal	12 grades	Social/emotional	School
14	Building Skills	Universal	6-12	Social/emotional; Behavior	School
15	CAPSLE: Creating a Peaceful School Learning Environment	Universal	6-12	Social/emotional; Behavior	School; Community
16	Career Academies	Universal; Selective	15-18	Behavior	School
17	Caring School Community (Child Development Project)	Universal	6-12	Social/emotional; Behavior; Academic	School
18	Child Development Project K	Universal	5-12	Social/emotional	School
19	Children of Divorce Intervention Program (CODIP)	Selective	6-12	Behavior; Anxiety	School
20	Cognitive Behavioral Intervention for Trauma in Schools (CBITS)	Indicated	12-14	Depression; Post-Traumatic Stress Disorder	School
21	Competent Kids, Caring Communities CALES	Universal	PreK-8 grades	Social/emotional	School; Home; Community
22	Connect with Kids	Universal	3-12 grades	Behavior	School
23	Coping Power	Universal; Selective	5-11	Behavior	School
24	Coping with Stress Course	Selective	13-18	Behavior; Depression	School
25	Counselors Care (C-CARE) and Coping and Support Training (CAST)	Selective; Indicated	13-17	Suicide; Depression; Anxiety; Social skills	School
26	Cross-Age Mentoring Program (CAMP) for Children With Adolescent Mentors	Universal; Selective	6-12; 13-17	Social functioning	School; Community
27	Curriculum-Based Support Group (CBSG) Program	Selective; Indicated	6-12	Social/emotional; Behavior	School
28	Dare to be You	Universal; Selective	2-5	Social/emotional	School; Community
29	Earlscourt Social Skills Group Program	Indicate	6-12	Behavior	School
30	Early Risers: Skills for Success	Selective; Indicated	6-12	Social/emotional; Behavior; Academic	Home; School; Community
31	EFFEKT (Orebro Prevention Program)	Universal	12-14	Behavior	School; Community
32	Facing History and Ourselves	Universal	6-12 grades	Social/emotional	School; Home; Community
33	Familias Unidas Preventive Intervention	Selective	12-14; 15-18	Behavior	School; Community; Home
34	Families and Schools Together (FAST)	Universal; Selective; Indicated	0-5; 6-12	Social/emotional; Behavior; Academic	School; Community

Table 9 Continued

	Program Name	Prevention Level	Age	Outcome Category	Setting
35	Family Check-Up (FCU) for Adolescents	Selective; Indicated	13-17	Internalizing Behaviors;	School; Outpatient; Home; Community
36	FAST Track	Indicated; Selective	6-12	Behavior	School
37	First Step to Success	Selective	4-5	Behavior; Depression	School; Community
38	Footprints for Life	Universal	6-12	Social competence	Home; school
39	FRIENDS Program	Universal	0-5; 6-12; 13-17	Anxiety; Depression; Social/emotional	School
40	Good Behavior Game	Universal	GBG:5-11 PAX GBG: 6-12	GBG: Behavior; Internalizing; Suicide PAX GBG: Behavior; Academic	School
41	Guiding Good Choices (GGC)	Universal	12-14	Behavior; Depression	School
42	High/Scope Educational Approach for Pre-School & Primary Grades	Universal	3-5	Social/emotional	School
43	I Can Problem Solve (ICPS) (Interpersonal Cognitive Problem Solving)	Universal	0-5; 6-12	Social/emotional; Behavior	school
44	Improving Social Awareness – Social Problem Solving	Universal	8-14	Social/emotional	School
45	Incredible Years	IY-Child Treatment: Selective; Indicated IY-Parent: Universal; Selective; Indicated IY-Teacher Classroom Management: Universal; Selective	3-4; 5-11	IY-Child Treatment: Behavior; IY-Parent: Behavior; Internalizing; IY-Teacher Classroom Management: Behavior; Social/emotional	IY-Child Treatment: Community; School IY-Parent: Community; School IY-Teacher Classroom Management: School
46	Joven Noble	Universal; Selective	13-17	Behavior	School; Community
47	Leadership and Resiliency Program (LRP)	Indicated; Selective	14-17	Social/emotional	School; Community
48	Lessons in Character	Universal	4, 5 grades	Social/emotional; Behavior; Academic	School
49	Life Skills Training	Universal	13-17	Social/emotional	School
50	Lifelines Curriculum	Universal	13-17	Suicide	School
51	Linking the Interests of Families and Teachers (LIFT)	Universal	6-11	Social/emotional	School
52	Lions Quest Skills Series	Universal	6-12; 13-17	Behavior	School
53	Michigan Model for Health	Universal	6-12; 13-17	Behavior	School; Home
54	MindUP	Universal	PreK-8 grades	Social/emotional	School
55	Montreal Longitudinal Experimental Study	indicated	7-9	Behavior	School; Community settings
56	Motivational Enhancement Treatment/Cognitive Behavior Therapy (MET/CBT)	Indicated	13-17	Behavior	School; Correctional Home
57	Multisystemic Therapy (MST)	Indicated	12-14; 15-18	Internalizing; Behavior	School; Home
58	New Moves	Universal; Selective	13-17	Mental health; Quality of life	School

Table 9 Continued

	Program Name	Prevention Level	Age	Outcome Category	Setting
59	Olweus Bullying Prevention Program	Universal; Selective	5-18	Behavior	School
60	PATHS: Promoting Alternative Thinking Strategies (P.A.T.H.S)	universal	5-11	Academic; Behavior; Social/emotional	School
61	Peacebuilders	Universal	6-12	Social competence; Behavior	School
62	Peer Coping Skills Training	Indicate	6-12	Behavior	School
63	Positive Action	Universal	5-11; 12-14	Academic; Behavior	School
64	Positive Family Support-Family Check-Up	Universal; Selective; Indicated	12-14	Depression; Behavior	School
65	Positive Youth Development Program	universal	11-14	Social/emotional	School
66	Primary Mental Health Project (Primary Project)	Selective	4-10	Social/emotional	School
67	Project MAGIC (Making A Group and Individual Commitment)	Selective; Indicated	6-12; 13-17	Behavior; Social/emotional	School; Community
68	Project Towards No Drug Abuse	Universal; Selective	15-18	Behavior	School
69	PROSPER (Promoting School-Community-University Partnerships to Enhance Resilience)	Universal	12-14	Behavior	School; Community
70	Queensland Early Intervention and Prevention of Anxiety Project	Indicated	7-14	Social/emotional	School
71	Raising Healthy Children	Universal	5-18	Academic; behavior	School
72	Reconnecting Youth: A Peer Group Approach to Building Life Skills (RY)	Selective; Indicated	13-17	Academic; Suicide	School
73	Relationship Smarts PLUS (RS+)	Universal	13-17	Social functioning	School
74	Resolving Conflict Creatively Program (RCCP)	Universal	6-12	Behavior; Social/emotional; Depression	School
75	Responding in Peaceful and Positive Ways (RIPP)	Universal	6-12; 13-17	Behavior	School
76	Responsive Classroom	Universal	K-6 grades	Social/emotional	School; Home
77	Ripple Effects Whole Spectrum Intervention System (Ripple Effects)	Universal; Selective; Indicated	6-12; 13-17	Academic; Social functioning	School
78	RULER Approach	Universal	K-8 grades	Social/emotional	School; Home
79	Say It Straight (SIS)	Universal; Indicated	6-12; 13-17	Academic; Behavior; Social/emotional	School; Community
80	School Transitional Environment Project (STEP)	universal	Transitioning students	Social/emotional	School
81	Schools And Families Educating Children (SAFEchildren)	Selective	6-12	Academic; Behavior; Social/emotional	School; Community
82	Seattle Social Development Project	universal	6-12	Social/emotional	School
83	Second Step: A Violence Prevention Program	Universal	6-12	Academic; Behavior; Social/emotional	School
84	Skills, Opportunities, And Recognition (SOAR)	universal	6-12	Social/emotional	School
85	SMART Team: Students Managing Anger and Resolution Together	Universal	6-12; 13-17	Academic; Behavior; Social/emotional	School

Table 9 Continued

	Program Name	Prevention Level	Age	Outcome Category	Setting
86	Social Decision Making and Problem Solving Program	universal	6-12	Social/emotional	School
87	Social Relations Program	Selective	10-11	Behavior; Depression	School
88	Social Skills Group Intervention (S.S.GRIN) 3-5	Selective; Indicated	6-12	Social functioning; Behavior	School
89	Sources of Strength	Universal	13-17	Suicide	School
90	Steps to Respect: A Bullying Prevention Program	Universal	5-11	Behavior	School
91	Strengthening Families Program (SFP)	Universal; Selective; Indicated	6-12; 13-17	Internalizing; Behavior	Home; School
92	Stress Inoculation Training	Selective	16-18	Social/emotional	School
93	Strong African American Families (SAAF)	Universal	5-11	Behavior	School; Community
94	Students Taking A Right Stand (STARS) Nashville Student Assistance Program (SAP)	Universal; Selective; Indicated	6-12; 13-17	Social functioning	School
95	Suicide Prevention Program I K	universal	12-14	Social/emotional	School
96	Systematic Training for Effective Parenting (STEP)	Selective	0-5 ; 6-12; 13-17	Social functioning; Behavior	School; Community
97	Teaching Kids to Cope (TKC)	Selective; Indicated	15-18	Depression	School
98	Teaching Students to be Peacemakers	Universal	0-5 ; 6-12; 13-17	Academic; Behavior; Social/emotional	School
99	TestEdge Program	Universal	13-17	Test anxiety; Social/emotional; Behavior	School
100	The 4Rs (Reading, Writing, Respect & Resolution)	Universal	6-12	Academic; Behavior; Social/emotional	School
101	The Fourth R: Skills for Youth Relationships	Universal	13-17	Behavior	School
102	The Leadership Program's Violence Prevention Project (VPP)	Universal	6-12; 13-17	Academic; Behavior; Social/emotional	School
103	Too Good for Drugs	Universal	3, 4, 6 grade	Behavior	School
104	Too Good for Violence	Universal	6-12	Behavior; Social/emotional	School; Community
105	Tools for Getting Along (TFGA): Teaching Students to Problem Solve (Anger Control Curriculum)	Universal; Selective	6-12	Behavior; Social/emotional	School
106	Tribes Learning Communities	Universal	K-12 grades	Social/emotional	School; Home
107	Triple p System	Universal; Selective	0-2; 3-4; 5-11	Mental health	School; Community; Home
108	Virginia Student Threat Assessment Guidelines (V-STAG)	Universal; Selective; Indicated	6-12; 13-17	Academic; Behavior	School
109	Zippy's Friends	Universal	0-5 ; 6-12	Social/emotional	School

Literature Search Procedure

The literature search procedure consisted of three steps. First, studies used for quality evaluation by the four organizations were searched. Second, studies listed on programs' official websites were identified. Third, an electronic search of databases PsycINFO, ERIC, and Academic Search Complete were conducted for each program independently. Program names (including previously used names) were used as key words and all text was searched for each program. Restrictions were set to journal article and English language. A total of 12,167 articles resulted from the electronic database search. Titles of articles were screened for outcome studies, and 43% ($n = 47$) of the 109 programs were searched twice for intra-rater reliability. Finally, references of each included study were manually searched for any additional studies. This systematic search yielded a pool of 1,117 studies.

Inclusion Criteria

Gate 1 Criteria: Study Type and Participant Characteristics

Full texts of the 1,117 studies were screened against three criteria: (a) Non-review. Literature review studies were excluded ($n = 72$). (b) Disability status. Studies consisted of at least 50% of participants with at least one disability diagnosis based on the IDEA criteria were included. Studies with less than 50% of participants with disabilities were excluded ($n = 851$). (c) Age. Participants composed of children and adolescents with a mean age of 5 to 18 or more than 50% of the sample were between the mean age of 5 to 18 were included. Studies with exclusive adult participants and did not report children or

adolescents outcomes were excluded ($n = 93$). This step yielded 110 studies with participants with disabilities.

Gate 2 Criteria: Study design, Intervention, Outcome, and Data Quality

Full texts of the 101 studies were screened against four criteria: (a) Study design. Studies used random controlled trials (RCTs) or quasi-experimental designs were included. The reason for involving RCTs was that studies using a pre- and post-design were not reliable for drawing statistical inferences about effectiveness, and the reason for including quasi-experimental design was that true random assignment may not be achieved due to ethical considerations (Rones & Hoagwood, 2000). Pre-post design study, predictive study, single-case study, descriptive study, and qualitative study were excluded ($n = 41$). (b) Intervention. The target evidence-based intervention and intervention used in the comparison group must be different. Studies compared two interventions based on the same underlying concepts were excluded ($n = 3$). (c) Outcome. Studies did not report children or adolescents outcomes were excluded ($n = 17$). (d) Data quality. Studies reported post-test means and standard deviations for both experimental and control groups were included. Any lack of these data led to exclusion ($n = 19$).

Twenty-one (21) studies fit the Gate 2 inclusion criteria. See Figure 10 for description of screening procedure. For studies comparing two or more experimental groups (e.g., Incredible Years with parent training or Incredible Years with child training) with one control group, each pair of comparisons was treated as one

independent study and the number of participants in the control group was divided by the number of experimental groups. Similarly, for studies comparing one experimental group with two or more control groups, each pair of comparisons was treated as one independent study and the number of participants in the experimental group was divided by the number of experimental groups. Eight more studies were added to the final pool based on this procedure. Therefore, thirty (30) peer-reviewed journal articles were included for coding and calculation of effect sizes. Two independent raters screened the 30 included studies against the inclusion gates; any disagreements were resolved until 100% consensus.

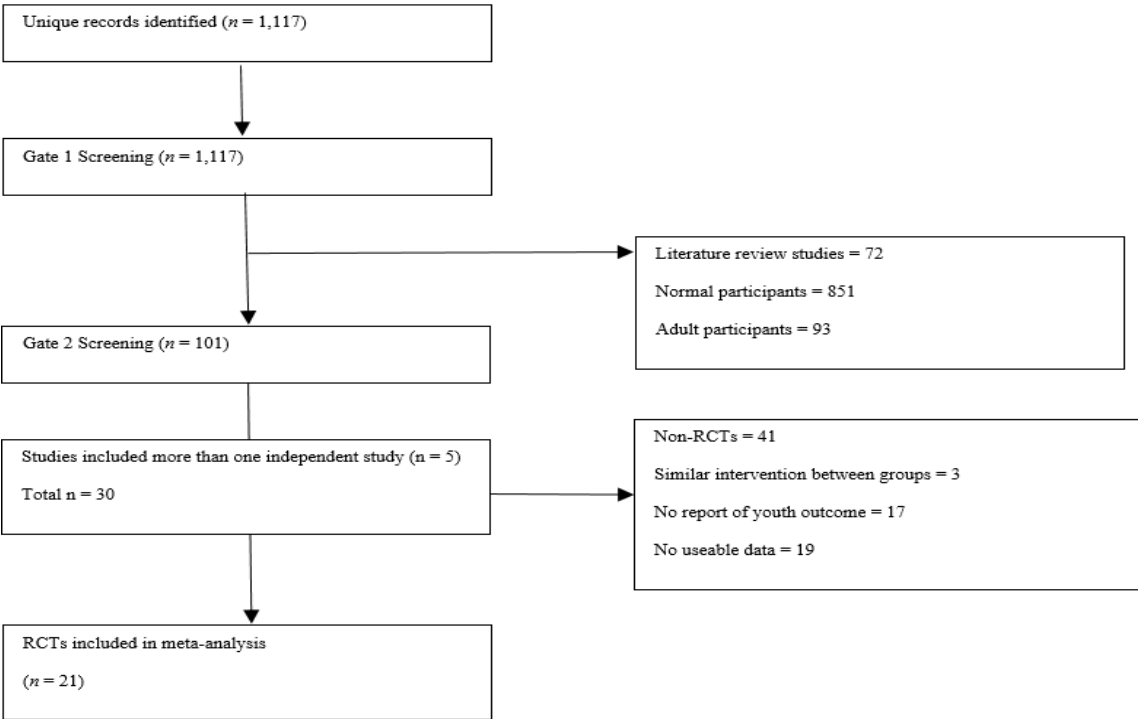


Figure 10. Screening procedure for included studies.

Coding and Reliability

Information of all included studies were extracted based on three categories: (a) participant characteristics included disability, age, gender, ethnicity, SES, and household location; (b) intervention characteristics included intervention type, intervention level, setting, service provider, treatment integrity, control condition, program length, program timing, parent or child training, and parental involvement; and (c) outcome measures. Two independent raters coded 30 studies based on these categories and any disagreement was solved by discussion until 100% agreement was reached.

Effect Size Calculation

Effect sizes were calculated using post-test data. The standardized mean difference between experimental and control groups was computed using Cohen's d statistic as the effect size. First, Cohen's d was derived by calculating the difference between the two group means and divided by the pooled standard deviation (Cohen, 1988). Cohen's d below .20 is considered a small effect, an effect size of .20 to .50 is a medium effect, an effect size of .50 to .80 is important, and anything above .80 is considered as large effect. Second, Cohen's d was transformed to Hedge's g to correct for the bias caused by small sample size (Lipsey & Wilson, 2001). Finally, for studies that measured several outcomes, Hedge's g was calculated for each outcome measure and these Hedge's g s were average to obtain an overall effect size for each study.

Moderation Analyses

Moderation analysis assists deciding what variables could alter the relationship between dependent and independent variables regarding direction and strength (Baron & Kenny, 1986). Moderation analysis was considered important for the current study because of the potential heterogeneity among participants and intervention programs. Due to the uneven number of studies for some moderators, moderation analyses were conducted with 6 moderators, which were participant age (younger than 8 years vs. older than 8 years), participant nationality (United States vs. Other), control condition (wait-list vs. other treatments), target participants (child vs. parent vs. both), intervention length (less than 18 sessions vs. more than 18 sessions), and implementation fidelity (yes vs. no).

Q statistics and I^2 were calculated as indicators of moderation analysis. Q statistic indicates whether sampling error could explain all the observed the variability among effect sizes. A statistically significant Q informs that study level variation exists and moderation analysis is entailed (Lipsey & Wilson, 2001). I^2 statistic indicates the percentage of variance of the total variance among effect sizes caused by moderators on study level. Higgins and Thompson (2002) suggested I^2 of 25%, 50%, and 75% represent low, medium, and high heterogeneity, respectively. For the current study, the analog to the analysis of variance was applied when both Q and I^2 indicated the need for moderation analysis.

Results

Descriptive Statistics

A total of 30 studies published between 1985 and 2015 were included in the current meta-analysis. Table 10 summarizes the descriptive information for each study.

Table 10
Summary of Study Characteristics

Study	Program	n	Participant	Ethnicity	Setting	Control condition	Length (session)	Fidelity
Axberg & Broberg, (2012)	Incredible Years	54	Parent	Swedish	Ordinary psychiatric service setting	Wait-list	13	Yes
Au et al., (2014)	Triple p	17	Parent	Chinese	Clinic	Wait-list	10	Yes
Brown et al., (2014)	Triple p	59	Parent	Australian	Hospital, university or community venues	TAU	10	Yes
Drugli & Larsson, (2006)	Incredible Years (PT)	75	Parent	Norwegian	University	Wait-list	14	No
Drugli & Larsson, (2006)	Incredible Years (PT+CT)	80	Child & parent	Norwegian	University	Wait-list	18	No
Herman et al., (2011)	Incredible Years (PT)	36	Parent	American	Clinic	Wait-list	13	No
Herman et al., (2011)	Incredible Years (CT)	35	Child	American	Clinic	Wait-list	18	No
Herman et al., (2011)	Incredible Years (PT+TT)	29	Child & parent	American	Clinic	Wait-list	13	No
Herman et al., (2011)	Incredible Years (CT+TT)	29	Child	American	Clinic	Wait-list	18	No
Herman et al., (2011)	Incredible Years (PT+CT+TT)	30	Child & parent	American	Clinic	Wait-list	23	No
Laugeson et al., (2012)	Social Skills Group Intervention	28	Child & parent	American	—	Wait-list	14	No
Larsson et al., (2009)	Incredible Years (PT)	61	Parent	Norwegian	Clinic	Wait-list	23	No
Larsson et al., (2009)	Incredible Years (PT+CT)	66	Child & parent	Norwegian	Clinic	Wait-list	13	No
McIntyre, (2008)	Incredible Years	49	Parent	American	—	TAU	12	Yes
Muratori et al., (2015)	Coping power (control group 1)	52	Child & parent	—	Clinic	TAU	52	Yes
Muratori et al., (2015)	Coping power (control group 2)	45	Child & parent	—	Clinic	TAU	52	Yes
Naar-King et al., (2014)	Multisystemic Therapy	167	Child	American	Clinic	TAU	27	Yes
Pereira et al., (2014)	FRIENDS	38	Child	Portuguese	School	Wait-list	12	Yes
Robinson et al., (2002)	Tools for Getting Along	41	Child & parent	American	School	Wait-list	10	Yes
Roux et al., (2013)	Triple p	52	Parent	Australian	—	Wait-list	9	Yes
Shortt et al., (2001)	FRIENDS	55	Child	Australian	—	Wait-list	12	Yes
Sundell et al., (2008)	Multisystemic Therapy	156	Child & parent	Swedish	Clinic	TAU	21	Yes
Spirito et al., (2015)	Family Check-Up	67	Parent	American	—	TAU	2	Yes

Table 10 Continued

Study	Program	n	Participant	Ethnicity	Setting	Control condition	Length (session)	Fidelity
Stattin et al., (2015)	Incredible Years	251	Parent	Swedish	School, social welfare agencies, psychiatry clinics	Wait-list	12	Yes
Williams et al., (1984)	STEP	38	Child & parent	American	School	Wait-list	9	No
Webster-Stratton & Hammond, (1997)	Incredible Years (PT)	33	Parent	American	Clinic	Wait-list	23	Yes
Webster-Stratton & Hammond, (1997)	Incredible Years (CT)	34	Child	American	Clinic	Wait-list	22	Yes
Webster-Stratton & Hammond, (1997)	Incredible Years (PT+TT)	30	Child & parent	American	Clinic	Wait-list	24	Yes
Webster-Stratton & Reid, (2011)	Incredible Years	94	Parent	American	Clinic	Wait-list	20	Yes
Wiel et al., (2007)	Coping power	64	Child & parent	—	Clinic	TAU	38	Yes

Note. PT = parent training; CT = child training; TT = teacher training; TAU = treatment-as-usual.

Participants Characteristics

A total of 1,856 children and adolescents were involved in the 30 studies. The mean age of participants was approximately 8.1 years and 76% were boys. Nineteen (19) studies involved children with behavioral disorders, the majority of which were opposite defiant disorder/conduct disorder (ODD/CD; $n = 15$). Four studies had other health impairment (OHI) as primary disability, including attention deficit hyperactivity disorder (ADHD; $n = 3$) and asthma ($n = 1$). Two studies involved anxiety disorders, two studies involved autism, one study included developmental disorder, one study had learning disability, and one study included traumatic brain injury. Comorbid disabilities consisted of intellectual disability, speech impairment, depression, vision impairment, hearing impairment, and cerebral palsy. Twenty-seven (27) studies reported participant ethnicity. Fifteen (15) studies recruited American participants and 12 studies recruited participants

from foreign countries, including Australia, Sweden, Norway, and China. Most studies did not report information on SES or household location.

Intervention Characteristics

The 30 studies involved 9 evidence-based interventions, which were Incredible Years ($n = 16$), Coping Power ($n = 3$), Triple P System ($n = 3$), FRIENDS program ($n = 2$), Multisystemic Therapy ($n = 2$), Family Check-Up ($n = 1$), Social Skills Group Intervention ($n = 1$), Systematic Training for Effective Parenting ($n = 1$), and Tools for Getting Along ($n = 1$). The included studies used interventions covered all three prevention levels. Twenty-four (24) studies explicitly described intervention settings. Eighteen (18) were conducted in clinics, three in school settings, two in universities, and one was described as hospital/university or community venues. Twenty-nine (29) studies reported intervention providers. The majority interventions were implemented by therapists, counselors, clinicians, psychologists or researchers ($n = 27$). Two studies were conducted by school personnel, including school psychologists or special education teachers. Almost half of the studies did not report implementation fidelity ($n = 11$). Twenty-two (22) studies included wait-list control conditions, the rest studies used treatment-as-usual or other types of active interventions as control conditions. The average intervention session was 18.6, ranging from 2 sessions to 53 sessions. Six studies included only youth participants, thirteen (13) involved only parent participants, and 11 consisted of both child and parent participants.

Outcome Measures

Outcome measures included externalizing and internalizing symptoms at home or school, problem behavior intensity, self-efficacy, social skills and competency, problem-solving skills, locus of control, student-teacher relationships, positive and negative impact on family, ability to identify feelings, ability to manage disability, and ability of medication adherence.

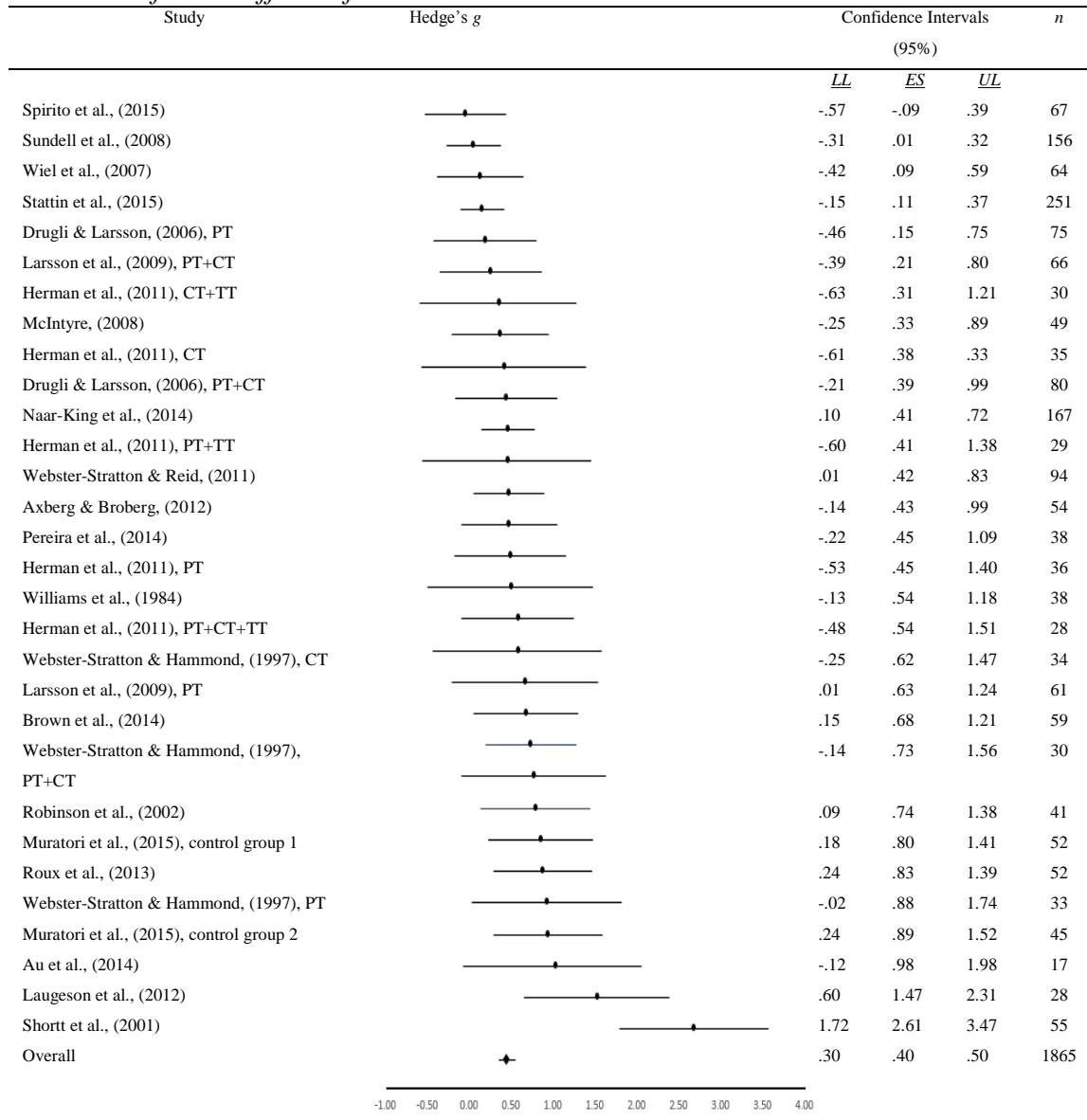
Intervention Efficacy

Overall Effects

The 30 included studies yielded a total of 140 effect sizes based on different outcome measures. These effect sizes were averaged based on the unit of study, then the omnibus effect size across studies was calculated. The overall standardized mean difference between experimental group and control group was .40 ($p < .000$, $SE = .05$, $CI_{95} = .30$ to $.50$), indicating that disabled youths who received evidence-based mental health interventions improved .4 standard deviation more than those who did not receive or received other services on the outcome measures. Table 11 summarizes study effect sizes. Q and I^2 analyses indicated that the effect sizes distribution was heterogeneous ($Q = 61.50$, $p < .001$; $I^2 = 52.8\%$). Therefore, moderation analyses were conducted to identify variables that could potentially explain the heterogeneity among effect sizes.

Table 11

Forest Plot for the Effects of Evidence-Based School Mental Health Interventions



Moderation Effects

Moderation analyses were conducted with participant age (younger than 8 years vs. older than 8 years), participant nationality (United States vs. Other), control condition (wait-list vs. other treatments), target trainee (child vs. parent vs. both), intervention length (less than 18 sessions vs. more than 18 sessions), and implementation fidelity (yes vs. no). Table 12 presents results of moderation analyses. Only intervention length could significantly explain the variability among effect sizes ($Q_B = 6.86$, $p < .01$; $I^2 = 85.4\%$), but the heterogeneity still existed after accounting for intervention length ($Q_W = 54.64$, $p < .01$; $I^2 = 48.8\%$).

Table 12
Results of Moderation Analyses

Moderator	<i>n</i> (studies)	<i>ES</i>	Q_B	Q_W
Age				
Younger than 8 years	20	.35	2.59	57.48***
Older than 8 years	10	.54		
Nationality				
United States	15	.44	.93	31.53
Non-U.S.	12	.33		
Control condition				
Waist-list	22	.42	.18	59.10***
Active treatment	8	.44		
Participant				
Child	6	.44	.18	61.20***
Parent	13	.42		
Both	11	.38		
Intervention length				
Less than 18 sessions	19	.57	6.86**	54.64**
More than 18 sessions	11	.30		
Treatment fidelity				
Yes	19	.44	1.03	60.47***
No	11	.33		

** $p < .01$; *** $p < .001$

Discussion

The goal of the current meta-analysis was to evaluate the effectiveness of evidence-based SBMH programs for students diagnosed with disabilities. One hundred nine (109) evidence-based programs were identified and 30 RCTs were included for analyses. The overall treatment effect size was .40, which was significantly higher than 0 and in the range of medium to small for Cohen's d . This result was consistent with previous meta-analyses indicating that SBMH outperformed control groups on social-behavioral outcomes and mental health symptoms (Becker, Brandt, Stephan, & Chorpia, 2014). Compared to the latest meta-analysis conducted by Baskin et al. (2010) with normally developed youths ($d = .45$), the current study found similar efficacy for youths with disabilities. Overall, the significant effect size found in the current study supported the efficacy of evidence-based mental health interventions for youth with disabilities. However, some phenomena worth noticing.

Interpretation of Findings

Small Number of RCTs for Youths with Disabilities

One hundred ten studies (110) involved evidence-based programs and participants with disabilities and 27.3% were RCTs that provided reliable experimental effects. This number was not very low. However, when looking at all studies screened for inclusion, nine hundred sixty-one studies (961) involved targeted evidence-based programs, 89.6% involved normal youth and only 11.4% included youth with disabilities. Of these studies, only 3.1% used strong experimental design. These data highlighted the paucity of

research in this area. Furthermore, of the 109 identified evidence-based programs, only 9 programs were applied to youth with disabilities using strong design. This number underscored the limited utility of evidence-based programs as well as the substantial space for future work with disabled youth.

Involvement of Academic Outcome Measures

Not only is there a paucity of studies conducted with disabled youth, but also a dearth of evaluation on academic outcomes. Historically, educational outcomes were not measured in mental health treatments even when the treatments were conducted in school settings where educational performance was the most interested outcome (Becker et al., 2014). Becker et al. (2014) coded 602 RCTs targeting children's mental health treatments and only 14.9% reported the measurement of educational outcomes. This phenomenon was also found for students with disabilities in the current study where none of the included studies measured educational outcomes. Future research needs to address this limitation.

As found in Study 1, SBMH directly predicted faster academic gains over time, indicating the promise of SBMH's capability in educational domain. Becker et al. (2014) reviewed 88 RCTs and found that participation in children's mental health treatment led to better academic achievement than comparison groups for 83.3% of the RCTs. Durlak et al. (2011) and Payton et al. (2008) found that students who participated in an SEL program experienced an 11 to 17 percentile-point advantage in achievement test scores relative to students who did not receive such programming. However, these studies did

not exclusively focused on students with disabilities and the effects of mental health treatments on this special population was not clear.

According to the findings from the current meta-analysis, no study was found to focus on the academic benefits brought by SBMH treatments. One explanation is that previous meta-analyses involved RCTs conducted in schools and thus the majority of them were universal prevention. However, most RCTs included in the current meta-analysis were conducted in private agencies outside of schools, resulting in a prioritization on reduction of mental health symptoms over educational performance. Future research is needed to investigate educational outcomes because improvements in mental health, attention, and classroom behaviors mediates the distal goal of improvement in academic outcomes (Lyon, Borntrager, Nakamura, & Higa-McMillan, 2013). Moreover, monitor of academic performance and integration of academic activities are necessary for future development of mental health treatments. In addition, most mental health services are not integrated with existing intervention systems in schools, such as RtI (Lyon et al., 2014). Without understanding of the impact of mental health services on educational outcomes, it is difficult to integrate fully these services into existing school systems and maximize their effects in school contexts.

Settings and implementers

Apparently, findings from the current meta-analysis indicated that evidence-based interventions for youth with disabilities have not been widely practiced in school contexts. The majority of included studies were conducted in clinics with

trained/experienced therapists, psychologists, counselors, or researchers. Only three studies were conducted in school settings and three studies were implemented by school psychologists or special education teachers. Therefore, even though the overall effectiveness was positive and significant, their transfer to school contexts and usability by school personnel needs further investigation. The bright side of the results was that effect sizes from the two school-personnel implemented studies yielded medium effect sizes (.54 and .74 respectively) larger than the mean effect size, suggesting the promise of teacher training.

Family Driven Intervention

Twenty-four (24) out of 30 studies involved parent training, and some studies involved only parent training for treatment of child social-behavioral or emotional problems. This trend reflected one of the federal goals recommended by the President's New Freedom Commission on Mental Health, which was stated as "involve consumers and families fully in orienting the mental health system toward recovery" (Hogan, 2003). In a qualitative study conducted by Lyon and colleagues (2014), almost half of the school personnel indicated the importance of family involvement in the development of mental health programs. The current meta-analysis indicated that parent or parent-child pair training was as effective as child-only training. This finding supported previous meta-analyses indicating the effectiveness of parent training for child behavior problems (Dretzke et al., 2009; Michelson, Davenport, Dretzke, Barlow, & Day, 2013). Healthy and positive family environment is very important for preventing the development of

mental health disorders in youth. Beuhring, Blum, and Rinehart (2000) analyzed data from the Add Health Survey of health-related behaviors with approximately 90,000 U.S. adolescents and found that the most consistently identified protective factor for health-risk behaviors, such as substance use, violence, suicidal attempts, and sexual abuse was a positive parent-family relationship. In addition, parent training brings positive family dynamic changes through improved parenting skills, which is one benefit that cannot be achieved by only focusing on the child. In the short-term, involving parent training may seem time-consuming and adds additional burden to both the family and the trainer. However, over the long-ran, the benefits in parenting skills and family changes would pay off the initial efforts because when these changes happen, fewer resources would be taken from schools for social-emotional and behavioral training and more resources can be allocated to academic instructions. Although initial findings from the current study supported the effectiveness of involving parents in mental health interventions for disabled youths, the number of research in this area is small and more work is needed.

Unanimous Effects between Age Groups

Moderation analysis found that the efficacy of evidence-based mental health programs was statistically equal between younger and older children. This result was different from previous meta-analyses (e.g., Baskin et al., 2010) finding that adolescents benefited more than children due to their more sophisticated cognitive and emotional abilities. Two reasons may explain this discrepancy. First, the current study included exclusively evidence-based programs that appraised as demonstrating promising or

exemplary effects. However, previous meta-analyses did not emphasize on this selection criterion and may include programs that were age sensitive. Second, previous meta-analyses included a broader range of participants and the major proportion of the RCTs in their meta-analyses were conducted in school settings, indicating that most of the interventions were universal. However, the current study focused only on youth with disabilities and most studies were conducted outside of schools, suggesting that the SBMH they received were individual services or interventions at selective level. Therefore, services received by participants of the current study are more intense in modality and more pertinent to target problems, leading to the inconsistent findings from previous meta-analyses. The non-significant difference between age groups was a good news for disabled youth in that the probability of unbalanced development between child intervention and adolescent intervention would decrease.

Unanimous Effects between Nationality Groups

The current study found that disabled youth from several countries benefited equally from evidence-based mental health programs. This result reflects again the homogeneity of disabled youth on the measured outcomes. The fact that almost half of the included studies ($n = 13$) were conducted in countries other than the U.S. indicated that evidence-based interventions originated in the U.S. were so valuable that they have been imported to other countries despite the reluctance of adopting practices from the U.S., especially for European countries (Ashford, 2012). Weist and McDaniel (2013) summarized manuscripts published from 2007 to 2013 in the journal of *Advances in School Mental*

Health Promotion and found that there was an international emphasis on SBMH, especially in Australia, Canada, and England. Results from the current meta-analysis are encouraging due to the positive and statistically equal effects for disabled youth with different nationalities because it improves the generalizability of evidence-based mental health programs.

Intervention Length

Intervention length was the only moderator that demonstrated different effects among disabled youth. The current study found that more intervention sessions did not benefit more than fewer sessions. Findings on the effects of intervention sessions of previous meta-analyses were mixed, with some studies found positive effects toward more intervention sessions and some yielded non-significant effects (Gellatly et al., 2007; Heyn, Abreu, Kenneth, & Ottenbacher, 2004; Hakamata et al., 2010; Wouters, Nimwegen, Oostendorp, & Spek, 2013). One possible explanation for the current finding might be that there is a ceiling effect after 18 intervention sessions with evidence-based programs involved in the current study, and more sessions yielded smaller effect size.

Treatment Fidelity

Treatment fidelity is an important procedure to improve internal validity of intervention in that it contributes to determining whether treatment gains, or lack thereof, might be related to the degree of success in delivering a treatment as intended (Randall & Biggs, 2008). The current meta-analysis found that treatment fidelity did not impact on the effectiveness of interventions. This might be due to that most of the interventions

involved in the current study were implemented by professionals, such as clinicians, therapists, and psychologists. Therefore, even though fidelity was not monitored in some studies, their outcomes were still significant and trustworthy. However, conducting research on multicomponent and comprehensive treatment approaches within dynamic and multifaceted school settings presents significant challenges to maintaining rigorous research methods, thus may compromise treatment effects or wrongly attribute student change to treatment. Therefore, to transfer evidence-based interventions from clinics to school settings, treatment fidelity is the central issue. Historically, implementation integrity has been found to be the major limitations when evaluating experimental studies (e.g., Klimes-Dougan et al., 2009). The current study also found this phenomenon, in which some studies published after 2010 still did not report information about treatment fidelity. In light of the role fidelity plays in the movement of evidence-based intervention, future research needs to document this information. Qualitative studies are also needed to identify facilitators and barriers for fidelity monitoring so that strategies could be developed to facilitate measuring and reporting of treatment fidelity.

Taking all the factors together, evidence-based mental health programs evaluated in the current meta-analysis were efficacious to disabled youth on mental health symptoms, behavioral, and social outcomes. Furthermore, these effects were age- , and nationality-resistant. However, these results had their limitations for generalization to school settings because most studies were conducted in clinics with therapists. Future researchers are encouraged to examine the effects of evidence-based interventions in

school contexts with school personnel because as mentioned above, school as a carrier for mental health intervention has its unique advantages.

Several barriers were found to inhibit the movement of evidence-based interventions to school settings, including time constraints experienced by school service providers (Lyon et al., 2013) and the heterogeneity of students (Lyon, Charlesworth-Attie, Vander Stoep, & McCauley, 2011). Olin, Hoagwood, Crowe, and Sake (2009) interviewed developers of 29 evidence-based programs to identify factors that facilitated and inhibited this movement. Time, beliefs about the intervention, competition with priorities and resources, supporting from school personnel, integration of interventions to existing school curricula, ongoing assistance and coaching, and economic support were found to influence the adoption and sustention of evidence-based interventions in schools. Lyon et al. (2014) interviewed 13 school mental health experts and stakeholders on the development and integration of a mental health program in school setting. Results indicated that integration with existing RtI structure, consistent universal screening and referral using standardized measures, engaging school staff by providing in-service training and child development education, and focusing on academic outcomes were key strategies that school personnel recommended for the successful implementation of mental health services in school settings. The authors also interviewed 30 experts in the domains of mental health services and school mental health. Findings indicated that integration of mental health services in existing tiered system was one consensus among experts. The second recommendation from experts was the emphasis on academic

outcomes along with typical mental health outcomes. The experts also recommended ongoing training and support to ensure treatment fidelity. No qualitative research has been conducted specifically for students with disabilities. However, these factors are believed to influence this movement even more for special needs students due to the already tight resources and limited experiences.

Findings from the current study indicated that evidence-based mental health interventions were beneficial to disabled youth on behavioral, social, and emotional outcomes. Because behavioral and social-emotional competencies contribute to academic and school success, they are believed also to benefit academic performance of disabled youth. Several researchers recommended strategies to transfer evidence-based interventions to schools (Forman, Hoagwood, Crowe, & Saka, 2009; Langley, Nadeem, Kataoka, Stein, & Jaycox, 2010), taking them together, several approaches are recommended here. (a) Administrative support to reconcile competing responsibilities on personnel and coordinate usage of campus space. (b) Ongoing effort to get buy-in from teachers and support to ensure implementation integrity. (c) Developing professional network to facilitate communications between professionals. (d) Engaging parents to facilitate treatment procedure and maximize treatment effects. (e) Funding to support the continuation of implementation and management of programs. Future work is needed to verify the feasibility and usefulness of these recommendations.

Limitations

Two major limitations were identified for the current study. First, only published studies were included for analyses. This may result in biased results and overestimation of treatment effects. McLeod and Weisz (2004) conducted a meta-analysis of dissertations with youth psychotherapy and found that effect sizes yielded by dissertations were approximately half of the published studies and demonstrated the file drawer problem. However, Reese, Prout, Zirkelback, and Anderson (2010) tested the file drawer problem in the effectiveness of SBMH therapies using dissertation studies. The authors found an omnibus effect size of .44 based on 65 dissertations between 1998 and 2008. The current study yielded comparable effect size that was slightly smaller than that of Reese et al.'s study. Therefore, the possibility of the current meta-analysis only involving manuscripts that reported impressive findings can be eliminated.

Second, evidence-based SBMH programs involved in the current study was not representative of all evidence-based SBMH programs due to the small number, especially when considering the rate of inclusion to exclusion of programs (9 to 100). Moreover, participants in the current study cannot represent all youths with disabilities either. Therefore, generalization of findings from the current study should be interpreted with caution. However, the current study found that almost half studies recruited youth from other countries than the U.S. and intervention effects were comparable. This result helped improve the ability of generalization of results from the current meta-analysis.

Implications

Despite the limitations mentioned above, information gleaned from the current study indicated the efficacy of evidence-based SBMH programs on behavioral and social competencies for youth with various disabilities. Future work is recommended to examine the effectiveness of these interventions in school settings and strategies for integration in consideration of the complicated issues affiliated with school contexts. Moreover, adaptation of existing evidence-based programs for students with disabilities is also encouraged because the current study found that programs originally designed for universal intervention were efficacious for students with disabilities. For example, the Friends program is a universal prevention and most of the studies identified in the current study using this strategy recruited normally developed children (75%). However, when implemented at indicated level and adapted for students diagnosed with anxiety disorders, this program demonstrated medium to high effects (ES of .45 and 2.65). Therefore, future researchers are recommended to try the evidence-based interventions originally designed as universal preventions with students diagnosed disabilities in small group or individual modalities. There are several advantages associated with this approach. First, the evidence-based universal preventions are well-developed and have been examined in target populations with target outcomes. It is common sense to adapt these interventions to students with disabilities who demonstrated similar target problems. Second, most of these strategies have detailed manuals and application instructions. It is the most efficient and cost-effective way to try these strategies in a new

population than to create a new program or implement a program that has not yet been appraised as evidence-based. However, there is also some cautions. If users, such as school personnel, only rely on the recommendations for these programs proposed by the government agencies, they may miss opportunities to select the most effective interventions for their students. So it is recommended that when selecting interventions, literature is the best and first place to start with (McLennan, MacMillan, & Jamieson, 2004).

CHAPTER IV

CONCLUSION

The current dissertation project investigated the status quo of school-based mental health services for students with disabilities. Study one analyzed the SEELS dataset to examine the effects of SBMH on the improvement of academic achievement and behavior change over time for students with disabilities. Study 2 evaluated the efficacy of evidence-based mental health programs for youth with disabilities. To the best knowledge, this is the first study that systematically examine SBMH for students with disabilities. Results indicated positive effects of SBMH on academic improvement and the efficacious of evidence-based programs for students with disabilities. These effects varied depending on participant and intervention characteristics. However, findings also indicated a lack of attention to educational outcomes in mental health services, as well as the small number of studies evaluating the effects of evidence-based interventions for students with disabilities. Future research is recommended to address these issues so that students with disabilities can obtain more benefits from SBMH services.

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