Dear Cape Cod and Islands Community:

On October 4th, 2013, a small group of dedicated behavioral health providers and consumers representing local agencies organized the first behavioral health summit on Cape Cod and the Islands to a sold-out crowd. The outcome of our summit was the creation of the Behavioral Health Provider Coalition of Cape Cod & the Islands (BHPCCCI) whose primary purpose is to facilitate opportunities for networking, communication, and sharing of knowledge between service providers in order to support an integrated and cohesive system of behavioral healthcare for residents of Cape Cod and the Island.

As the Affordable Care Act has expanded mental health and substance use disorder benefits to approximately 60 million Americans, the need to improve care and capacity in behavioral health is apparent today more than ever. The BHPCCI has recognized the importance of integrated and person-centered care as we work together to meet the increased demand for services, encounter new funding challenges, and consider options for integrated care here on Cape Cod and the Islands.

The BHPCCI is proud to highlight these local opportunities at our **3rd Annual Behavioral Health Summit - Building Bridges to Recovery, Friday, October 2nd** at the **Hyannis Resort and Conference Center**. This year's Summit showcases **"Models of Promise"** - connecting behavioral and physical health services across a continuum from collaboration to full scale integration of services.

Presenters at this year's Summit include healthcare leaders, representatives from our state legislature, human service agencies, public safety officials, and peer and family advocates. They will present their experiences and expertise on integrating and coordinating care, taking into account the limitations and opportunities of resources and funding in today's world.

Please join us in welcoming our presenters and we hope you find today's agenda educational and informative. BHPCCI thanks you for your participation as we move forward to improving the quality of care to our residents of Cape Cod and the Islands. If you would like to become a member of the BHPCCI Coalition, please visit our website at www.bhpccapecod.org.

Respectfully,

Diane Wolsieffer and Ron Holmes
Chair/Co-Chair, Behavioral Health Provider Coalition of Cape Cod & the Islands

The BHPCCCI would also like to thank the following organizations for their continued support and commitment in making sure our Behavioral Health Summit is a success.

- Cape Cod Five Foundation
- Cape Cod Healthcare
- Duffy Health Center
- Franey Medical Laboratories
- Gosnold on Cape Cod

8:00 am to 8:30 am – Registration

8:30 am to 9:00 am – Welcome and Introductions

9:00 am to 10:15 am – KEYNOTE SPEAKER

SENATOR JENNIFER FLANAGAN, D-Leominster

Senator Flanagan earned a Bachelor's degree in Political Science from the University of Massachusetts Boston and her Master's degree of Science in Mental Health Counseling from Fitchburg State University. She began her career working in the mental health profession as a counselor for young girls at You, Inc. Currently, Senator Flanagan serves as Chair of the Mental Health and Substance Abuse Committee, Chair of the Children and Families and Persons with Disabilities Committee, and Chair of the Special Senate Committee on Opioid Addiction.

10: 30 am to 11:45 am – "Community Initiatives: Integrating Mental Health & Substance Abuse and Public Safety"

Moderator: *Raymond Tamasi, President/CEO – Gosnold on Cape Cod*
Panelists: Barnstable Police Community Impact Unit, Dennis Police Community Services Unit, Yarmouth Police Mental Health and Substance Abuse Outreach Team, Department of Mental Health and Gosnold on Cape Cod Clinicians

11:45 am to 12:00 pm – Review of Break-Out Focus Groups

12:00 pm to 1:00pm – Lunch

1:15 pm to 2:30 pm – Break-Out Sessions

1. "Calmer Choice – A Universal Prevention Program in Cape Cod Schools" – Fiona Jenson, OTR/L, Founder/Executive Director and Adria Kennedy, NP, Program Director, Calmer Choice; Bart Main, MD, Child and Adolescent Psychiatrist, Centers for Behavioral Health – Outpatient, Cape Cod Healthcare
2. "What Happened Here: The Untold Story of Addiction on Cape Cod" documentary film presented by filmmakers Sam Tarplin and Nate Robertson
3. "Self-Advocacy in Motion on Cape Cod" – Moderator: Pat Durgin, OTR/L, Program Manager, Centers for Behavioral Health-Partial Hospital, Cape Cod Healthcare. Participants: Parents Supporting Parents; NAMI on Cape Cod and Islands; Dance in the Rain-Whole Person Approach; Waves of Wellness Recovery Connection Center

2:45 pm to 4:00 pm – "Integrating Care: Challenges and Opportunities on Cape Cod"

Moderator: *Cheryl Bartlett, Executive Director – Office of Community Health, Cape Cod Healthcare*
Panelists: Jonas Bromberg, PsyD, Program Manager, Behavioral Health Integration, Pediatric Physicians' Organization at Children's Hospital; Debbie Ciavola, RN, PhD, Executive Director and Daria Hanson, MD, Medical Director, Centers for Behavioral Health, Cape Cod Healthcare; Wesley Klein, DO, Medical Director, Duffy Health Center; Raymond Tamasi, President/CEO and Catie Dotolo, Director of Integration Projects, Gosnold on Cape Cod

4:00pm – Closing Remarks

Ron Holmes & Diane Wolsieffer, APRN
Co-Chair's, Behavioral Health Provider Coalition of Cape Cod & the Islands

Keynote Speaker – 9:00 am to 10:15 am - Grand Ballroom

Jennifer Flanagan, D-Leominster

Senator Flanagan earned a Bachelor's degree in Political Science from the University of Massachusetts Boston and a Master's degree of Science in Mental Health Counseling from Fitchburg State University. She began her career working in the mental health profession as a counselor for young girls at You, Inc. Senator Flanagan serves as Chair of the Mental Health and Substance Abuse Committee, Chair of the Children and Families and Persons with Disabilities Committee, and Chair of the Special Senate Committee on Opioid Addiction.

10:30AM TO 11:45PM PANEL DISCUSSION - Community Initiatives: Integrating Mental Health & Substance Abuse and Public Safety – Grand Ballroom

Join police officials from behavioral health and substance abuse focused task forces and their clinical counterparts in learning about new initiatives addressing the needs of both mental and substance abuse health care and public safety.

Facilitator	**Raymond Tamasi, President/CEO Gosnold of Cape Cod**
Barnstable Police Community Impact Unit	Sgt. Jean Challies, Officer Jennifer Ellis, Officer Jason Sturgis, Charlene Poliquin, LICSW
Yarmouth Police Mental Health and Substance Abuse Outreach Team	Sgt. Andrew O'Malley, Officer Michael Zontini, Officer Diana Wells, Det. Sgt. Kalil Boghdan
Dennis Police Community Services Unit	Sgt. Kenny Gelnett, Officer Ryan Carr, Officer Nick Patsavos
Department of Mental Health	Sarah Stanley, LICSW, Director of Emergency Program, Cape and Islands Patrick McGuire, LMHC, DMH Crisis Clinician
Gosnold of Cape Cod	Lori McCarthy, Director of Clinical Outreach Kristoph Pydynkowski, LADC, Certified Recovery Coach

Session #1 – Osterville Conference Room

"Calmer Choice – A Universal Prevention Program in Cape Cod Schools"

Fiona Jensen, OTR/L | Executive Director, Calmer Choice
Adria Kennedy, MSN, NP | Program Director, Calmer Choice
Bart Main, MD | Child/Adolescent Psychiatrist, Centers for Behavioral Health – Outpatient, Cape Cod Healthcare

Calmer Choice

Calmer Choice is a universal prevention program committed to teaching young people how to effectively and safely manage stress and resolve conflict so that they live happy, healthy and successful lives. Our goal is to provide skills that will diminish the risk of violence, substance abuse, and other self-destructive behaviors.

The target population for Calmer Choice programming is youth in grades K-12 in the 15 towns of Cape Cod (Barnstable County). This includes eight schools districts and 25,000 students in grades K-12. Due to a primarily seasonal economy and high cost of living, many of the youth are at risk economically and socially. In some of Cape Cod's schools, up to 90% of the students receive free or reduced cost lunches. While high school students are especially vulnerable, students of all ages often struggle with mental, emotional and behavioral issues resulting in poor academics, bullying, violence, stress and depression. In fact, it has become clear that most mental, emotional and behavioral challenges actually begin in childhood. Providing Calmer Choice to elementary students capitalizes on important developmental windows that set the stage for a lifetime of healthy behaviors, opportunities that have the potential to improve the health and wellbeing of an entire generation.

Session #2 – Grand Ballroom

"What Happened Here: The Untold Story of Addiction on Cape Cod"

Sam Tarplin | Co-Chair – Recovering Youth Coalition
Nate Robertson | Co-Chair – Recovering Youth Coalition
Filmmakers Sam Tarplin and Nate Roberson will preview their full-length documentary film, "What Happened Here: The Untold Story of Addiction on Cape Cod" and talk about their newest advocacy project, the Recovering Youth Coalition.

Sam Tarplin is a recovering heroin addict from Falmouth, MA. At ninety days clean, Mr. Tarplin embarked on a photography project to document the phenomena of opioid addiction – and recovery – here on Cape Cod. This small photography project has now turned into a full length documentary film which has sold hundreds of copies and has been seen by several thousand of people from all over the United States. In addition to his filmmaking endeavors, Mr. Tarplin is also the founder and co-chair of the politically motivated Recovering Youth Coalition, and president of the Students Achieving Recovery Together (START) club at Cape Cod Community College. He is a graduate of Falmouth High School and is working towards a LADC II credential as well as psychology Bachelor's degree.

Nate Robertson grew up in a lovely suburban town Rhode Island. He attended college and studied in Vermont where substance use started to take a more prominent role in his life. After four years of college he returned home a full blown opiate addict. While struggling to balancing life with substance use, Nate eventually overdosed and was revived with Naloxone by EMT's. Though it was not a straight line, he found his way into recovery and has been clean for multiple years now. Today, he works in harm reduction, prevention, and is an advocate in his community. He credits a sense of purpose, peer-support, and his family as the primary drivers of his continued recovery.

Session #3 – Centerville Conference Room

"Self-Advocacy in Motion on Cape Cod"

Moderator: Patricia Durgin, OTR/L | Program Manager, Centers for Behavioral Health – Partial Hospital, Cape Cod Healthcare
Panelists: Mary Munsell/Alejandro Marcel - Dancing in the Rain – Whole Person Approach, Deb Rausch/Dan Shay - NAMI on Cape Cod, Lisa Murphy - Parent Supporting Parents, and Don Lonergan - Waves of Wellness Recovery Connection Center. Learn more about the important role of peers and family as part of treatment and recovery in behavioral health.

Dance in the Rain Whole Person Approach mission is "to inspire peer to peer mental health empowerment through community based programs and engagement. Fostering self-advocacy, sustaining inner equanimity and achieving wholeness while living our lives with mental illness". Dance in the Rain is a place for people with mental illness, depression and dual diagnosis to help build wholeness and self-empowerment by becoming accountable to oneself. It's a place where wholeness and a person's potential will be nurtured and allowed to grow. Dance in the Rain through its' various programs will challenge people to look at the way they view mental illness and their recovery. It is also a place where we strive to bring the Cape and Islands communities to work together to end stigma and help bring the much needed changes within the mental health system. Dance in the Rain seeks to help turn the mental health system on Cape Cod & the Islands into a Cape& Islands Mental Health Community. Dance in the Rain Whole Person Approach offers diverse and organic programs developed by Mary E Munsell who has lived with mental illness for over 35 years. These programs are fresh and challenge the mental health system, the peer community, the business community and community at large to redefine how they perceive mental illness, the mentally ill and recovery in our communities. Dance in the Rain operates out of its own professional space bringing in peers to support and run its many programs.
www.danceintherain-wpa.org

The National Alliance on Mental Illness (NAMI) Cape Cod in Hyannis is a grass-roots non-profit organization serving the families and friends of people with mental illness, as well as the individuals who have a mental illness themselves on Cape Cod and The Islands. Programs and Services are provided through Support, Education and Advocacy. We are an affiliate of both NAMI Massachusetts and NAMI National in Washington D.C. NAMI Cape Cod & the Islands serves individuals and their families who are affected by the broad spectrum of mental illnesses and neurological disorders through support, education and advocacy, and promote wellness for all. NAMI Cape Cod & the Islands strives to provide an understanding of the broad spectrum of neurological disorders and differences. We provide a network of systems and support groups and educational programming for individuals and their families. We advocate for and support services for the mental wellness of our total constituency. Enlightenment and education of the general public on matters of mental health is part of the ultimate goal. www.namicapecod.org

Parents Supporting Parents is a parent support group based in Mashpee which helps parents and family members cope with their child's addiction. Parents Supporting Parents mission is to support, strengthen, and educate ourselves and others as we help our children achieve sobriety and live a healthy lifestyle with love. Web site at this time is Face Book based found at
http://www.facebook.com/pages/Parents-Supporting-Parents/186663034743781

Waves of Wellness Recovery Connection Center (RCC) is an entirely peer-run organization dedicated to providing support, education and advocacy by providing opportunities and resources to assist individuals in finding their own path to mental health recovery. The RCC in Hyannis has no barrier of access for people who self-identify as having a mental health issue in the past or present and/or having substance abuse issues. All the services of the Recovery Centers are free of charge. It does not matter if a person is or was connected to a mental health agency or provider, it does not matter if a person was ever diagnosed with a mental health issue, it does not matter if a person was or was not hospitalized. Our doors are open to everyone and anyone who feels they belong and wants to join a recovery community. www.southeastrlc.org

2:45PM TO 4:00PM PANEL DISCUSSION - Integrating Care: Challenges and Opportunities on Cape Cod – Grand Ballroom

Learn about some of the newest opportunities in our community for medical and behavioral health care integration, featuring screening and primary care integration.

Facilitator	**Cheryl Bartlett, Executive Director Office of Community Health Cape Cod Healthcare**
Gosnold of Cape Cod *Primary Care and Specialty Practice Integration*	Raymond Tamasi, President/CEO Catie Dotolo, Director of Integration Projects
Cape Cod Healthcare *CCH/FH Emergency Room and Hospital Behavioral Health Integration*	Debbie Ciavola, RN, PhD, Executive Director Daria Hanson, MD, Medical Director Centers for Behavioral Health
Children's Hospital *Cape Cod Pediatric Office Integration*	Jonas Bromberg, PsyD, Program Manager, Behavioral Health Integration, Pediatric Physicians' Organization at Children's Southeast and Upper Cape Region
Duffy Community Health Center *Community Integration*	Wesley Klein, DO, Medical Director

DOI 10.1007/s10597-012-9517-y

ORIGINAL PAPER

Crisis Intervention Team (CIT) Programs in Rural Communities: A Focus Group Study

David Skubby · Natalie Bonfine · Meghan Novisky · Mark R. Munetz · Christian Ritter

Received: 9 October 2011 / Accepted: 30 June 2012 / Published online: 21 July 2012

Abstract The Crisis Intervention Teams model (CIT) was originally developed as an urban model for police officers responding to calls about persons experiencing a mental illness crisis. Literature suggests that there is reason to believe that there may be unique challenges to adapting this model in rural settings. This study attempts to better understand these unique challenges. Thematic analysis of focus group interviews revealed that there were both external and internal barriers to developing CIT in their respective communities. Some of these barriers were a consequence of working in small communities and working within small police departments. Participants actively overcame these barriers through the realization that CIT was needed in their community, through collaborative efforts across disciplines, and through the involvement of mental health advocacy groups. These results indicate that CIT can be successfully implemented in rural communities.

Keywords Crisis intervention · Criminal justice · Law enforcement · Police officers · Rural communities

Introduction

Individuals with mental illness in crisis pose unique challenges to community law enforcement officers. Much attention has shifted to approaches that officers and other community stakeholders use to address this issue. It is estimated that 10 % of contacts between the public and law enforcement involve a person with a mental health problem (Watson et al. 2010). As law enforcement officers are the "primary gatekeepers" to the criminal justice system (Lamb et al. 2002: 1266), they are often faced with difficult decisions about how to best respond to individuals experiencing a psychiatric crisis. This is particularly important because officers typically spend more time on these calls and because these calls may be unpredictable or result in a violent outcome for the officer or for the individual with mental illness (Hanafi et al. 2008; Watson et al. 2008).

The Crisis Intervention Team (CIT) program fosters collaborative ties between law enforcement, the mental health treatment system, consumers and consumer advocates. The goal of this collaboration is to improve the understanding of, and safety and service to, individuals with mental illness and their families (Cochran et al. 2000; Compton et al. 2008; Dupont et al. 2006; Hanafi et al. 2008). CIT officers have undergone specialized training to improve their response to calls involving a person experiencing a mental health crisis through recognition of mental illness and de-escalation training (Watson et al. 2010). CIT implementation requires and represents a community partnership in which law enforcement and the mental health system work together to respond to individuals in crisis (Cochran et al. 2000; Ralph 2010; Watson et al. 2008).

Research on how and why CIT has been successfully implemented in communities varies widely. Some studies have examined challenges to CIT implementation more broadly, analyzing CIT in a variety of communities, counties, and states (Dupont and Cochran 2000; Reuland 2004). Others have looked at challenges to CIT implementation statewide (Munetz et al. 2006; Oliva and Compton 2008),

D. Skubby (✉) · N. Bonfine · M. R. Munetz · C. Ritter
Department of Psychiatry, Northeast Ohio Medical University, Rootstown, OH, USA
e-mail: dskubby@neomed.edu

N. Bonfine · M. Novisky
Kent State University, Kent, OH, USA

while still others have studied CIT in specific urban areas (Canada et al. 2010; Ritter et al. 2010; Teller et al. 2006). Recent research has even looked at benefits and challenges to implementing CIT in special settings, such as airports (McGriff et al. 2010). What is lacking in the literature is research into the challenges to CIT implementation in rural areas (Compton et al. 2010). The present study attempts to explore this topic, thus addressing a critical gap in the literature.

There is reason to believe that the successful implementation of CIT programs in rural communities is different than in urban settings. In rural areas, there are specific system and environmental challenges that community partners face (Compton et al. 2010). For example, as Kempf (2008) reports, there is a general lack of psychiatric treatment facilities in rural areas. Because state mental health treatment facilities are often the only alternative for individuals in crisis in these areas, police transport of individuals can be time consuming (Compton et al. 2010; Kempf 2008; Sullivan and Spritzer 1997). Therefore, for CIT to be effectively implemented in rural areas, CIT must be adapted to meet local needs, and it must include close collaboration between local law enforcement and mental health personnel (Chamberlain 2006). Since the CIT model has been developed, disseminated, and researched within urban settings (see Teller et al. 2006, Ritter et al. 2011, 2010 and Watson et al. 2010), rural communities may need to adapt the urban model to better fit their specific local needs (Chamberlain 2006). Research is needed that can evaluate the success or failure of these adapted urban models in rural communities (Compton et al. 2010).

The present study is one part of a larger, ongoing research endeavor surrounding the development of community jail diversion initiatives for individuals with mental illness. The Ohio Criminal Justice Coordinating Center of Excellence provides technical assistance to communities to develop jail diversion programs that are developed along the Sequential Intercept Model (e.g. CIT, Mental Health Courts, etc.) (Munetz and Griffin 2006). This broad, qualitative project seeks to better understand the collaborative process of program development in rural, urban and suburban communities that are working towards jail diversion programs. This study included focus groups conducted annually on an ongoing basis as a means to evaluate program development of jail diversion efforts, as well as to evaluate the technical assistance provided by the Criminal Justice Coordinating Center of Excellence. From this ongoing study, we have developed a large, descriptive qualitative data set of narratives around a variety of programs at various stages of development. This current study focuses our qualitative research on the exploration of the barriers and challenges that community stakeholders in rural areas might face in implementing CIT programs. This is important because rural communities are urged to utilize urban models of CIT (Chamberlain 2006). Knowledge of stakeholders' experiences utilizing the urban model will aid in the understanding of whether modifications need to be made to the urban model of CIT when used in rural communities.

Methods

Qualitative research methods are designed to gain an understanding of a particular topic through narratives and in-depth descriptions (Lehoux et al. 2006). The purpose of this present study is to gain an in-depth understanding of how community stakeholders implement CIT in their rural communities by analyzing narratives. This, coupled with the fact that CIT implementation in rural areas is an under-researched topic that needs descriptive data, makes qualitative research an appropriate methodological design to meet the goals of this project.

This study utilized the focus group interview. Focus groups are a methodological technique used when gathering data from a homogeneous group that has never been or rarely studied (Huberman and Miles 2002; Lehoux et al. 2006). Focus group methodology was used in our broad study in an attempt to understand the implementation of jail diversion programs in communities in Ohio. This current study focuses on CIT through the narratives of professionals implementing CIT. One of the goals of this study was to explore collaboration among professionals regarding CIT implementation.[1] Focus groups were appropriate because such methods are able to "capture the natural interplay of perspectives on research questions, which would be limited in individual interviews, surveys, or observations" (McGriff et al. 2010: 155).

Stakeholders were asked about their perspectives on CIT and the personal experiences they had in developing collaborative efforts to sustain a CIT program. Law enforcement officers, community mental health professionals, system administrators, and consumer advocates from six rural communities[2] in Ohio were solicited by research staff

[1] As the focus group project was an effort to better understand jail diversion program development, including CIT, and cross-system collaboration in general, the research team met with individuals who were involved in broad community planning activities. Consumer advocates who were involved in planning CIT were invited to attend the discussion. However, other consumers who may have been involved with CIT or otherwise may have been affected from the CIT program were not included.

[2] We classified rural communities based on the categorization suggested by the Ohio Department of Mental Health and Ohio Department of Development (2008). This conceptualization was derived from the U.S. Census data and the Appalachian federal designations. The six communities are defined as the board area

to participate in the focus group discussions in their communities. The six communities were in varying stages of CIT program development, with some regularly offered CIT trainings, while others were in the process of collaborating to develop and implement CIT. These individuals were invited to participate in the discussions based on their involvement in local efforts to develop a CIT program, or as a result of their involvement in community collaborative efforts for other jail diversion programs. Nine focus group discussions were conducted in these six rural communities between 2006 and 2009. Each discussion consisted of 6–10 participants. Individuals recruited to participate included mental health professionals, criminal justice personnel, court personnel, consumers of mental health services, and advocates for families and consumers of mental health services. Mental health professionals (n = 37) consisted primarily of counselors, social workers, and service administrators. Criminal justice personnel (n = 29) included patrol officers, law enforcement administrators (e.g. Police Chief, Sheriff), jail administrators, and correctional officers. Court personnel (e.g. judges, probation officers, prosecutors) were included in some discussions as the community collaborative group had implemented court-based diversion programs in addition to CIT. Consumers and advocates (n = 4) were the third group involved in the focus group discussions (total N = 70).

Each focus group lasted approximately 90 min. The focus groups were audio-recorded and later transcribed verbatim. Participants were also given the opportunity to write thoughts and comments and to privately share this input with the research team if they did not feel comfortable sharing within the group discussion. This study was approved by the Institutional Review Boards at Northeastern Ohio Universities College of Medicine (NEOUCOM, now called Northeast Ohio Medical University), and Kent State University, and all participants provided written informed consent prior to the start of each focus group. The authors have no conflicts of interest, and all authors certify responsibility for this manuscript.

For this paper, the research question is: What are the challenges to implementing CIT in your community? Topics discussed during the focus groups that relate to this question include: (1) perspectives of the criminal justice and mental health treatment systems; (2) perceptions of CIT and other jail diversion efforts, and (3) strategies the collaborative group is utilizing to overcome identified obstacles. After transcriptions were reviewed for accuracy by members of the research team, data were organized based on the topics of barriers to CIT implementation, overcoming barriers to CIT implementation, and the effects of CIT implementation. These topics were largely driven by the both the questions asked and how participants responded. The data were independently coded and sorted by 3 members of the research team (per Weiss 1994). This analysis resulted in the emergence of several themes for each of the three topics. Below is support for these themes based on participants' narratives.

Results

Barriers to CIT Implementation

Concerning the topic of barriers to CIT implementation, focus group participants discussed their perspectives regarding the obstacles they faced in starting up the CIT program. In addition, they spoke of their concerns for the future in sustaining implementation of CIT in their particular communities.

Obstacles to Implementing CIT

Focus group participants cited two major obstacles in putting CIT into operation in their communities. First, they stated that both mental health professionals and law enforcement officials had different ways of thinking about the population of individuals with mental illnesses. They stated that these different perspectives had the potential to derail the implementation of CIT. Second, participants stated that issues related to the internal resources needed to start CIT training within small police departments were also a potential problem in getting CIT off the ground in their communities.

Law enforcement and mental health professionals understood that each had a different orientation toward mental illness. Some found this a possible barrier to future cooperation between the two professions. One mental health professional stated, "You have a mindset (among law enforcement) that needs to be adjusted in my opinion. 'Somebody has committed a crime and somebody needs to pay.' And that is the focus, as opposed to the reason behind the behavior." Another mental health professional stated, "I think at the law enforcement level ...it's all about

Footnote 2 continued
monitored by the alcohol, drug addiction and mental health services boards. These mental health boards oversee the mental health services for the county or counties within the board area. We included communities (board areas) classified as rural and Appalachian within our analyses (Ohio Department of Mental Health 2008). Two communities were categorized as suburban per this classification, so we confirmed based on the U.S. Census classification system by examining the population per square mile (U.S. Census Bureau 2011). As neither of these communities met the U.S. Census criteria for urbanized areas or urban clusters, and as the U.S. Census classifies all territory outside of urban areas and urban clusters as rural (U.S. Census Bureau 2011), we categorized these communities as rural.

punishment, it's not about rehabilitation. And so there's this big disconnect."

There were also stated differences in professional values. For example, one criminal justice professional said, "There was a lot of antagonism from the two cultures, because there's a major language difference, a misunderstanding of problems." Another mental health worker highlighted the problem of language by saying, "It's really hard to get everyone to have the same beliefs as everyone else. Still, to this day, I'll get a call from the jail and they'll just say, 'we've got one of your wackos over here you need to see.' You know, you're saying this to a mental health professional." Thus, participants admitted that there were differences in how each perceived the other's professional orientation toward people with a mental illness.

There was also concern that these differing orientations affected relationships between law enforcement and mental health professionals. One criminal justice professional summed up the situation before CIT was implemented: "There was a lot of over the years, for a lack of a better word, *animosity*, between the law enforcement side and the mental health side. CIT was one of the things identified that needed to come into the county to try to address that issue...but the underlying part and goals of CIT is to build bridges and mend fences between the two sides" (original emphasis). Many focus group participants believed that a secondary consequence to implementing CIT would be to build better relationships between law enforcement and mental health personnel. Participants thus conveyed that there was some division between professionals that hindered any type of collaboration between criminal justice and mental health workers before the beginnings of CIT.

Misunderstandings and differences in values were characteristic of the relationship between police officers and mental health professionals. Study participants were also troubled with the lack of additional resources for CIT training. They stated that there were two potential problems concerning resources for CIT training programs in their communities; one was costs for putting on and filling the training, and the other was about staffing the department while officers were being trained.

Participants were concerned about funding to send rural police officers to a 40-hour CIT training session. Specifically, they were concerned about paying overtime. One officer said, "At first, it wasn't super easy to get the trainees to come to CIT. That involved paying overtime in some cases." Another criminal justice official stated, "Especially because we're a small county department, if somebody goes to class, they've got to cover for that person on the road. Where are the dollars available to try to reimburse the communities for that overtime to cover that cost?" A mental health professional also stated, "The bigger communities have a little more flexibility to try to absorb costs and that type of thing."

Another difficulty in organizing CIT training in these communities was staffing departments while some officers went through CIT training sessions. One mental health professional stated, "It is a challenge in a rural community to get all the departments to be able to free up officers for a whole week." Another mental health professional said, "The departments are primarily part-time departments with only a couple of full-time people. So for them to commit to the program...Some of the people who came to our last class actually took a vacation from their other jobs so that they could come to the class...It's a real challenge to have that commitment from the county chiefs knowing that a lot of their departments are part-time."

Obstacles to Sustaining CIT

Focus group participants gave their perspectives on what they thought might be future obstacles to the sustainability of CIT. They stated that the two major obstacles that could derail CIT in their communities were the lack of resources for persons with a mental illness, and the lack of data on offenders with a mental illness.

First, law enforcement and mental health personnel agreed that the lack of economic resources to treat individuals with a mental illness has become an issue in their communities. The closing of state hospitals has placed a burden on police and counselors, and has left them little choice but to put some offenders with mental illness in jail. One mental health professional said that "state hospitals close and clients that were diverted from the state hospitals were sent to the community. The funding never followed the way it was supposed to. So now you have an overburdened county mental health system and an overburdened jail system... Unfortunately as mental health dollars continue to be contracted, we get fewer and fewer mental health dollars, more and more of our clients are ending up in your (the criminal justice) system."

Focus group participants were also firm in their belief that money for treating individuals with a mental illness in their particular communities was a scarce resource because of the *size* of their community. One mental health provider suggested that because they do not work in an urban area, they don't always get the funding they need. "I think that one of the things that I get frustrated about is, I think the state and federal government say, 'Where can we have the biggest impact for our buck?' And it's always, always the urban areas. It's just a frustration because we have the same problems they have in urban areas. It's just at a smaller scale."

There was also expressed concern over gathering data that could evaluate how well the CIT program was meeting

its objectives. As one mental health professional stated, "In order to know what our goals should be, I'd like to see what other people are doing and how they structure their outcome measures. I mean, how do we know it works or whether or not it did what was best?" Another mental health professional put it this way: "From a continuous improvement perspective, it's really important for us to measure ourselves with others. To make this really work, I think we really have to be clear on outcomes." While such sentiments indicate a need to collect outcomes data to determine the impact of CIT, participants were unaware about how to make such data collection a reality.

Overcoming Barriers to CIT Implementation

The second topic discussed was one of overcoming barriers to implementing CIT. Three themes emerged from the discussion of this topic. First, both law enforcement and mental health professionals realized that there was a need to handle the mentally ill population more appropriately in their communities. Second, they reported that advocacy groups such as the National Alliance on Mental Illness (NAMI) were able to support community stakeholders in their quest to overcome barriers to implementing CIT. Third, they adapted the urban model of CIT to fit the needs of their smaller sized police departments.

Realization of Need for CIT

Criminal justice and mental health professionals alluded to the seriousness of the problem of mental illness in their communities. They agreed that the placement of offenders with mental illnesses in jails was an inadequate response to the problem. They believed that offenders with mental illnesses were in need of treatment, and they believed that jails were becoming increasingly dangerous, especially for individuals with mental illness. One law enforcement officer said, "Incarceration is not the place for these people." Another declared, "There are folks out there that have issues that commit criminal acts but they're really not criminals, they have other things going on, and throwing them in jail really doesn't do any good. It really isn't appropriate for them." Still another law enforcement official admitted that it was treatment, not punishment, which most of these offenders needed. "These people, if you really sat down and looked at them, they don't belong in jail. Some do, but most of them don't belong in a jail. They have an illness, they need treatment, they need care, you know?"

Some focus group participants' experiences influenced their realization that CIT was needed in their community. For example, the closing of local state hospitals convinced many in rural areas that CIT was needed. One criminal justice professional said, "At one time, we had a very large state psychiatric hospital, so mental health services have been part of the community for a long time. But when the shifting of mental health services went from in-patient to out-patient to criminal justice system essentially, people took notice and then went, 'OK, what do we do about it?' When we offered some solutions to that, they jumped on the bandwagon very quickly."

During the course of the focus group interviews, participants spoke about how CIT started in their communities. In fact, officers' and mental health service providers' own shared experiences paved the way for CIT training in these areas. Many saw a need for more collaboration between criminal justice and mental health personnel, and therefore saw a real need for CIT. For example, many participants saw a need for CIT to bridge the gap between professional cultures and training of mental health and criminal justice personnel in their communities. A mental health professional, having already seen CIT training in another county, drew on the experiences of law enforcement personnel to start the process of CIT, "Officers at the jails were telling me, 'these people don't need to be here. I don't know what to do with them.' And they kept telling the road officers they shouldn't be bringing these people here. And so that kind of generated my interest into well, how do other people deal with that. So I started talking about it (CIT)."

Advocacy

CIT in some of these communities began because of the support of advocacy groups and local NAMI chapters. Most of the focus groups mentioned how strong, supportive and involved local NAMI affiliates were in the communities. These advocate groups are viewed as partners within collaborative efforts and instrumental to the development of collaborative efforts. A law enforcement officer in one community who is working to develop CIT stated, "NAMI has been the sole collaborator on the CIT project so far." Others viewed NAMI affiliates as serving an important function by educating the community. One mental health professional said, "They (NAMI) offer all kinds of activities and educational things. NAMI has given us grants to help with our CIT trainings."

Adapting to Urban Model

Because of the different make-up of the police departments in the communities that we sampled, focus group participants noted that CIT may need to be adapted to meet their needs. For instance, many believed that the training targets for CIT that are generally accepted for urban areas may not be appropriate for rural communities. As one focus group

participant summarized, "I know it's usually 25 % of your department. Being in a rural setting, we've decided to train everyone. Both in the city and in the county. Because we don't have that luxury of having that many officers that are trained on any one shift. Or the ability to have somebody there waiting, especially in the county, to wait on the individual who is trained. So it's worked out well with everybody being trained."

Effects of CIT Implementation

A final topic that was discussed was the description of the effects of employing CIT in participants' respective communities. This topic has two emergent themes. The first is one of increased collaboration between mental health and criminal justice personnel. The second involves the appreciation of the benefits of CIT in the community.

Increased Collaboration

Focus group participants saw the CIT program as a way of breaking down barriers between mental health and law enforcement personnel. Specifically, they saw the CIT program as enhancing cooperation, communication, and understanding between these professionals.

First, the data show that focus group participants perceived that *cooperation* among each other had improved since their CIT programs began. This meant that more collegial relationships had developed between mental health and criminal justice personnel since CIT implementation. As an illustration, one mental health professional stated, "We've been happy with the improvements that have occurred over the last year and a half, 2 years. It's made a difference that we are beginning to provide CIT training to the officers. And I think relationships between law enforcement and the behavioral health care system have improved as a result of that." One law enforcement officer suggested that CIT has resulted in increased partnerships, saying, "It's the best I've seen in an effort to do that in all my time in this county. We need more of it, and with other departments, because we're all in it together and that's the key here. And you can't be in it together if you don't know one another." Finally, one mental health professional stated, "I think the single most important element of the success here has been close collaboration by people who are dedicated to the project and who work well together." Cooperation through collaboration was not only seen as a vital outcome of CIT, but also necessary for implementation.

Second, much of this increased cooperation was due to increased *communication*. Communication between mental health and criminal justice personnel became more open after implementing CIT, according to focus group participants. This was illustrated by one police officer who said, "There's a lot of communication between them (mental health agencies) that we haven't had in the past. It has to do with police departments and how they work and go about asking for things. We've had follow-up discussions about pink-slipping[3] and about how to communicate what you need to the departments, and how, if you call up this department and say you need this, this, and this, they're probably going to say 'go pound salt.' Or, how you can present it in a different light and how they'd be more receptive to doing what you want them to do." In addition, one mental health professional suggested that this new open communication was a good sign of mutual support. "The police do one thing, mental health does another thing. The courts do a third thing. We've demonstrated that that can happen by thinking outside the box, or being open to that communication, and what could we do to help each other."

Third, focus group participants noted an increase in *understanding* of both mental health and criminal justice systems since the CIT program was launched in their communities. Law enforcement personnel in the study felt that CIT contributed to an understanding of how the mental health system worked. Said one officer, "If you talked to officers, they really didn't understand how the mental health system worked. So part of the CIT program is explaining to them how the mental health system works. So we've had to really build on that and explain those things to people. That's part of what CIT programming is bringing." But criminal justice professionals also believed that CIT helped in educating mental health workers as well. For example, one officer noted, "We found out that there was a misunderstanding on the mental health side of what law enforcement's role was in pink-slipping. They didn't understand that law enforcement officers can pink slip someone for a number of reasons. So we went to (a mental health treatment agency) and provided that training to the emergency psychiatric service folks. Now there's a clearer understanding on the mental health side of what law enforcement can do." Another criminal justice professional stated that after CIT, mental health professionals were more understanding of what police officers do during their work day. "I think the mental health professionals are much more appreciative of the kinds of situations law enforcement finds themselves in. Like 'you do what? You go where? You deal with that kind of thing?'"

[3] "Pink slipping" is the commonly-used phrase for the process of initiating the emergency detention of an individual for a psychiatric evaluation to determine whether the person requires involuntary hospitalization, per the Ohio Revised Code (2011) §5122.10.

Benefits to Community

There were two ways in which CIT aided these rural communities in the eyes of the participants. First, participants perceived that police were better able to respond to the needs and problems of people with mental illnesses in the community. Second, participants believed that the community's relationship with the police had improved.

Mental health personnel reported seeing changes in how police responded to people in crisis after CIT. One counselor stated. "I have seen the sheriff's deputies in action here sometimes at night when there is limited staff around. They've needed to support us in dealing with persons who had the potential to get out of control. I have felt very supported and that they clearly are about trying to de-escalate the situation. Not show any force and just be kind, be very understanding, be very appropriate with the people they've had to deal with. So I feel like all the training they have had has certainly helped them to accommodate our needs for them to respond." Another mental health professional related a story of an officer who was at first reluctant to participate in CIT, but later found the training useful when faced with a potential suicide. "He (the officer) no sooner came out of the class and had five attempted suicide calls that he went on within a week, and had received a call from a family member who thanked him for actually saving their family member's life. And left me this voicemail and he said, 'I just had to send you this voicemail because I wanted you to know that this was the best training I ever went through. I wasn't sure if I wanted to go through it but I'm glad I did.'"

Many officers who were interviewed felt that CIT prepared them with a plan of action when encountering a person experiencing a mental health crisis. One officer said, "It's easier now that there's a method. It's not just hit and miss. Here's a plan of action, instead of just, basically we were trial and error with a lot of these folks. It just seems smoother, more professional." Another officer related a story of how he was able to calm a potentially harmful situation involving someone with schizophrenia. "He was escalating all the other residents. And probably if I had not arrived the person would have been tasered and rendered unhappy. It would have been an unpleasant thing. But I actually got in and talked him down, talked him through it, got him into the cruiser, got him transported, and got him turned over."

Focus group participants also reported that they believed the community's relationship with the local police had improved after CIT training. Many felt that increased credibility due to their newly acquired skill in dealing with people experiencing a mental health crisis was important. The skill of being able to defuse potentially dangerous situations involving a person in a mental health crisis has eased community fears. One police officer suggested that the community is well aware of situations where many armed officers are called out, but appreciate it when officers can resolve a situation without much fanfare. He stated, "On a one-on-one or two-on-one police officer talking to somebody and defusing the situation—that's invisible, people don't even see it. And I think that's one of the keys to this is the success on the street is totally invisible because no one knows it's happening."

But much of what CIT officers do in their communities, according to many of the focus group participants, is visible and appreciated by those with mental illness and by family members. Some mental health professionals noted that since CIT, families have been appreciative of the work CIT officers do and have developed better relationships as well. One mental health professional stated, "CIT has just made all the difference in the world... of being able to handle the patients quietly. Family members used to fear calling the law, fear for the family member. And so many actual reports have been that the person has really been in crisis, and law enforcement officers come and just talk quietly. They (the family) could not actually believe that they just went away and went to the hospital willingly, with no problem at all. So that's made a huge difference in families being willing to call."

Discussion

The central research question of this focus group study of community stakeholders in the area of mental health in rural areas was: What are the challenges to implementing and sustaining CIT in these communities? Participants raised the issues of barriers to successful CIT implementation, how they overcame potential barriers, and the benefits of CIT implementation in their communities.

Analysis of the data revealed that professional orientation towards mental illness inhibited understanding between law enforcement and mental health personnel. This was one potential barrier to CIT implementation. Other barriers to CIT, according to the focus groups, were the lack of funding for training costs and lack of replacement officers to patrol the communities while regular officers were being trained. Participants suggested that it was difficult for departments to absorb the costs of CIT training in their small communities because of the overtime pay that was required for the training itself and the extra police work in the community. While this may be a concern for all police training, CIT may present a unique challenge to community police departments. Few police trainings are a week long. Also, CIT is one of a few training programs that is not exclusively provided by or through a police training bureau. Because it is a partnership

with the mental health system, as well as family and consumer groups, the police do not have the same level of control over the training and may therefore not feel the same level of ownership at the level of police executive leadership. This may contribute to resistance to support the program, although future research would need to examine this claim. In addition, the problem of the closing of state hospitals in rural areas was seen as a potential barrier to the sustainability of CIT in these communities and counties. While having only one psychiatric facility to transport mentally ill offenders to is a potential barrier in some urban areas (Canada et al. 2010), having *no* options in transporting individuals to psychiatric facilities has the potential to be a severe blow to CIT sustainability in rural areas. Finally, the lack of systematic data collection to evaluate the CIT program was also cited as a potential barrier to CIT growth.

However, these community stakeholders, including law enforcement, mental health professionals and consumers, families and advocates overcame barriers to CIT implementation by first coming together to recognize that the excessive incarceration of mentally ill individuals was inappropriate. Thus they recognized a need for and the importance of CIT. These stakeholders also partnered with advocacy groups such as NAMI to overcome barriers. There is evidence that stakeholders have modified the urban CIT model in some rural communities by training the entire police department rather than one-fourth as recommended. This study shows preliminary evidence that urban models can be adapted for use in rural areas.

There are several methodological limitations to this exploratory study. First, the qualitative nature of this study limits our ability to generalize our findings across settings. We attempted to overcome this limitation by gathering information across multiple communities, and have gathered a rich, descriptive data set. However, the applicability of these results to other communities may be limited. Further, while the protracted length of time of the study period is not ideal, we are not aware of any events at the community level over the 3 years that may have affected our interpretation of the data. Second, we did not assess demographic characteristics (e.g. race, gender) of our sample. Differences in perspective by demographic characteristic were not a focus of this study, as we were interested in the different perceptions by occupational field (e.g. criminal justice, mental health). However, future research will need to assess demographic differences of individuals in their perception of CIT. Third, this study involved some input from consumer advocates, but future studies would benefit from increased input from consumers, family members and other advocates about their involvement in developing CIT, as well as their perceptions of the impact of CIT. A fourth limitation relates to the status of CIT in the communities that comprise our sample. For this study, all community stakeholders are from programs that are either working towards CIT program development or have implemented CIT. An important comparison would be to examine these issues among community stakeholders from areas that have not implemented CIT, or have tried unsuccessfully to start a CIT program. In Ohio, while many rural communities have established CIT programs, others have yet to overcome the barriers. Future research should assess the perceptions of stakeholders in such communities for a more complete understanding of the barriers that exist around CIT program development.

Based on early data on CIT in rural communities, some suggestions can be made for those developing CIT in rural communities. First, collaborative groups might engage in cross-systems training to better understand the role and perspectives of other collaborative partners in order to facilitate CIT implementation. Second, due to lack of funding in rural communities, stakeholders will need to be creative in the use of local resources and talent in sustaining CIT. For instance, college or university students may be helpful in creating research studies or evaluations of CIT programs. Third, advocacy groups such as NAMI can serve as important champions in the development and sustainability of CIT in rural communities. Fourth, the needs of the local community should be determined to better understand how CIT can be most effective. Processes such as system mapping, a group activity that traces the interface between the criminal justice and mental health treatment systems, draw upon the strength and knowledge of the collaborative group that oversees the CIT program. Such activities can highlight unforeseen barriers and areas of resources and may be a helpful tool for communities (GAINS Center 1996).

References

Canada, K. E., Angell, B., & Watson, A. C. (2010). Crisis Intervention Teams in Chicago: Successes on the ground. *Journal of Police Crisis Negotiations, 10*(1–2), 86–100.

Chamberlain, C. (2006). *Making jail diversion work in rural communities* [powerpoint slides]. Rockville, Maryland: Substance Abuse and Mental Health Services Administration; 2006. Retrieved January 4th, 2010 from http://gainscenter.samhsa.gov/html/resources/presentation_materials/pdfs/3_06_Net-tele_Slides.pdf.

Cochran, S., Deane, M., & Borum, R. (2000). Improving police response to mentally ill people. *Psychiatric Services, 51*(10), 1315–1316.

Compton, M. T., Bahora, M., Watson, A. C., & Oliva, J. R. (2008). A comprehensive review of extant research on crisis intervention team (CIT) programs. *Journal of the American Academy of Psychiatry and the Law, 36*(1), 47–55.

Compton, M. T., Broussard, B., Hankerson-Dyson, D., Krishan, S., Stewart, T., Oliva, J. R., et al. (2010). System- and policy-level challenges to full implementation of the Crisis Intervention Team (CIT) model. *Journal of Police Crisis Negotiations, 10*(1–2), 72–85.

Dupont, R., & Cochran, S. (2000). Police response to mental health emergencies—barriers to change. *The Journal of the American Academy of Psychiatry and the Law, 28*, 338–344.

Dupont, R., Cochran, S., & Pillsbury, S. (2006). *Crisis Intervention Team Core Elements* (pp 1–20). The University of Memphis School of Urban Affairs and Public Policy, Department of Criminology and Criminal Justice CIT Center, September.

GAINS Center (1996). *The National GAINS center for people with co-occurring disorders in the justice system: brochures.* Retrieved February 2, 2012 from (http://static.nicic.gov/Library/013913.pdf).

Hanafi, S., Bahora, M., Demir, B. N., & Compton, M. T. (2008). Incorporating crisis intervention team (CIT) knowledge and skills into the daily work of police officers: A focus group study. *Community Mental Health Journal, 44*, 427–432.

Huberman, A. M., & Miles, M. B. (2002). *The qualitative researcher's companion.* Thousand Oaks: Sage Publications.

Kempf, M. (2008). *Mental illness and the criminal justice system in Indiana.* The National Alliance on Mental Illness (NAMI) Indiana. Retrieved May 19, 2011, from (http://www.nami.org/Content/Microsites169NAMI_Indiana/Home156/Resources87/Kempf_Report_6_13_2008.pdf).

Lamb, H. R., Weinberger, L. E., & DeCuir, W. J. (2002). The police and mental health. *Psychiatric Services, 53*(10), 1266–1271.

Lehoux, P., Poland, B., & Daudelin, G. (2006). Focus group research and "the patient's view". *Social Science and Medicine, 63*, 2091–2104.

McGriff, J. A., Broussard, B., Neubert, B. N. D., Thompson, N. J., & Compton, M. T. (2010). Implementing a crisis intervention team (CIT) police presence in a large international airport setting. *Journal of Police Crisis Negotiations, 10*, 153–165.

Munetz, M. R., & Griffin, P. A. (2006). Use of the sequential intercept model as an approach to decriminalization of people with serious mental illness. *Psychiatric Services, 57*, 544–549.

Munetz, M. R., Morrison, A., Krake, J., Young, B., & Woody, M. S. (2006). Statewide implementation of the crisis intervention team program: The Ohio model. *Psychiatric Services, 57*(11), 1569–1571.

Ohio Department of Mental Health (2008). *Mental health boards of Ohio by geographic classification.* Office of Program Evaluation and Research. Retrieved May 19, 2011, from (http://www.mh.state.oh.us/assets/research-evaluation/data-bulletins/1-board-area-map.pdf).

Ohio Revised Code (2011). *Section 5122.01.* Retrieved September 23, 2011, from (http://codes.ohio.gov).

Oliva, J. R., & Compton, M. T. (2008). A statewide crisis intervention team (CIT) initiative: Evolution of the Georgia CIT program. *The Journal of the American Academy of Psychiatry and the Law, 36*, 38–46.

Ralph, M. (2010). The impact of crisis intervention team programs: Fostering collaborative relationships. *Journal of Emergency Nursing, 36*(1), 60–62.

Reuland, M. (2004). *A guide to implementing police-based diversion programs for people with mental illness.* Delmar: Technical Assistance and Policy Analysis Center for Jail Diversion.

Ritter, C., Teller, J. L. S., Marcussen, K., Munetz, M. R., & Teasdale, B. (2011). Crisis intervention team officer dispatch, assessment, and disposition: Interactions with individuals with severe mental illness. *International Journal of Law and Psychiatry, 34*(1), 30–38.

Ritter, C., Teller, J. L. S., Munetz, M. R., & Bonfine, N. (2010). Crisis Intervention Team (CIT) Training: Selection effects and long-term changes in perceptions of mental illness and community preparedness. *Journal of Police Crisis Negotiations, 10*, 133–152.

Sullivan, G., & Spritzer, K. (1997). The criminalization of persons with serious mental illness living in rural areas. *Journal of Rural Health, 13*, 7–13.

Teller, J. L. S., Munetz, M. R., Gil, K. M., & Ritter, C. (2006). Crisis intervention team training for police officers responding to mental disturbance calls. *Psychiatric Services, 57*(2), 232–237.

United States Census Bureau (2011). *Census 2000 urban and rural classification.* Retrieved May 19, 2011, from (http://www.census.gov/geo/www/ua/ua_2k.html).

Watson, A. C., Morabito, M. S., Draine, J., & Ottati, V. (2008). Improving police response to persons with mental illness: A multi-level conceptualization of CIT. *International Journal of Law and Psychiatry, 31*, 359–368.

Watson, A. C., Ottati, V. C., Morabito, M., Draine, J., Kerr, A. N., & Angell, B. (2010). Outcomes of police contacts with persons with mental illness: The impact of CIT. *Administration Policy and Mental Health, 37*, 302–317.

Weiss, R. S. (1994). *Learning from strangers: The art and method of qualitative interview studies.* New York: Free Press.

BMC Psychiatry

BioMed Central

Research article

Open Access

Mental health first aid training for the public: evaluation of effects on knowledge, attitudes and helping behavior

Betty A Kitchener and Anthony F Jorm*

Address: Centre for Mental Health Research, Australian National University, Canberra, Australia

E-mail: Betty A Kitchener - betty.kitchener@anu.edu.au; Anthony F Jorm* - anthony.jorm@anu.edu.au

*Corresponding author

Published: 1 October 2002

BMC Psychiatry 2002, 2:10

Received: 15 July 2002

Accepted: 1 October 2002

This article is available from: http://www.biomedcentral.com/1471-244X/2/10

Abstract

Background: Many members of the public have poor mental health literacy. A Mental Health First Aid training course was developed in order to improve this. This paper describes the training course and reports an evaluation study looking at changes in knowledge, stigmatizing attitudes and help provided to others.

Methods: Data are reported on the first 210 participants in public courses. Evaluation questionnaires were given at the beginning of courses, at the end and at 6 months follow-up. Data were analyzed using an intention-to-treat approach.

Results: The course improved participants' ability to recognize a mental disorder in a vignette, changed beliefs about treatment to be more like those of health professionals, decreased social distance from people with mental disorders, increased confidence in providing help to someone with a mental disorder, and increased the amount of help provided to others.

Conclusions: Mental Health First Aid training appears to be an effective method of improving mental health literacy which can be widely applied.

Background

First aid courses are a well-established way of improving the public's handling of medical emergencies, but such courses typically ignore mental health issues. However, there are several reasons for extending this approach to mental disorders. Firstly, the prevalence of mental disorders is so high that virtually everyone in the community can be expected to either develop a mental disorder themselves or to have close contact with someone who does [1,2]. Secondly, the public often have poor mental health literacy [3]. They cannot recognize specific disorders or different types of psychological distress and they differ from mental health experts in their beliefs about the causes of mental disorders and the most effective treatments. Finally, there is a widespread stigma on mental disorders which causes an additional burden on sufferers [4]. These factors lead to delays in recognition and help-seeking, hinder public acceptance of evidence-based mental health care, and cause people with mental disorders to be denied effective self-help and appropriate support from others in the community [3].

To help overcome these problems, we have devised a first aid course, called Mental Health First Aid, focusing specifically on mental health issues. We did not believe it was possible to deal with these issues in adequate detail within the confines of an existing first aid course. The purpose of

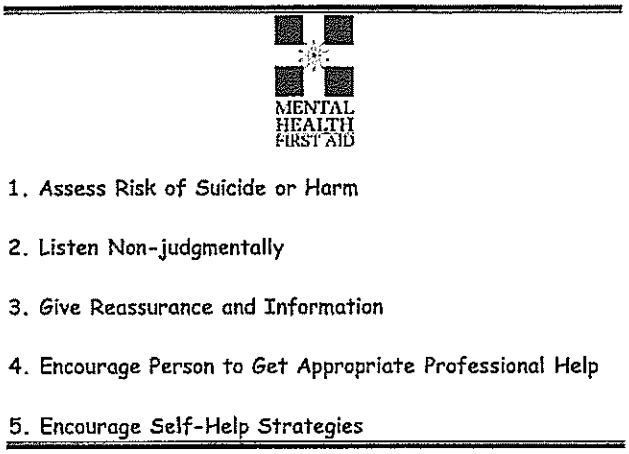


Figure 1
Steps in providing mental health first aid

this paper is to describe the course and report data evaluating its effects.

Methods

Description of the program

This nine hour course is usually delivered as three sessions of three hours each across three consecutive weeks. Each participant receives an accompanying course manual [5]. The content covers helping people in mental health crises and / or in the early stages of mental health problems. The crisis situations covered include suicidal thoughts and behaviour, acute stress reaction, panic attacks and acute psychotic behaviour. The mental health problems discussed include depressive, anxiety and psychotic disorders. The co-morbidity with substance use disorders is also covered. Participants learn the symptoms of these disorders, possible risk factors, where and how to get help and evidenced-based effective help.

Five basic steps have been devised as an action plan for carrying out Mental Health First Aid (see Figure 1). This action plan is applied to each of the problem areas covered.

The same instructor (BAK) taught all the courses. Mental Health First Aid courses have been conducted in two settings: with members of the public who respond individually to publicity and do courses in the evenings at the Centre for Mental Health Research, and with workplaces which request courses during working hours.

Evaluation method

The evaluation reported here was carried out with the first 210 participants in the public courses. These participants were given questionnaires to self-complete at the beginning of the first session of the course (pre-test), at the end of the last session (post-test) and were mailed a questionnaire 6 months after completing the course (follow-up). The questionnaires had an ID number but no name.

The pre-test questionnaire began by asking about the sociodemographic characteristics of the participant and whether they had ever experienced a mental health problem themselves or whether someone in their family had. Participants were next asked "How confident do you feel in helping someone with a mental health problem?" (1. Not at all, 2. A little bit, 3. Moderately, 4. Quite a bit, 5. Extremely). This was followed by: "In the last 6 months have you had contact with anyone with a mental health problem?" (Yes/ No/ Don't know). If the participant said "yes", they were asked "How many people?" and "Have you offered any help" (1. Not at all, 2 A little, 3. Some, 4. A lot) and "What type of help?" (blank lines were provided for a description). The next section of the questionnaire was taken from the National Survey of Mental Health Literacy [6]. Participants were presented with a vignette of a person who had either major depression ("Mary") or schizophrenia ("John"). Because it would have been too time consuming for participants to answer questions about both vignettes, they were randomly assigned to receive one or the other and were given this same vignette at each assessment. They were asked "From the information given, what, if anything is wrong with Mary/John" (open-ended question) and "Do you think Mary/John needs professional help?" (yes/ no). Then followed a list of people, treatments and actions that the person in the vignette might use and participants were asked to rate each of these as likely to be helpful, harmful or neither. The list was: a typical GP or family doctor; a chemist or pharmacist; a counselor; a social worker; telephone counseling services, e.g. Lifeline; a psychiatrist; a clinical psychologist; help from her/his close family; help from some close friends; a naturopath or a herbalist; the clergy, a minister or a priest; Mary/John tries to deal with her/his problem on her/his own; vitamins and minerals; St John's wort; pain relievers such as aspirin, codeine or panadol; antidepressants; antibiotics; sleeping pills; anti-psychotics; tranquillisers such as valium; becoming more physically active such as playing more sport, or doing a lot more walking or gardening; read about people with similar problems and how they have dealt with them; getting out and about more; courses on relaxation, stress management, meditation or yoga; cutting out alcohol altogether; counseling; cognitive-behavior therapy; psychotherapy; hypnosis; admission to the psychiatric ward of a hospital; electroconvulsive therapy (ECT); having an occasional alcoholic drink to relax; a special diet or avoiding certain foods. To score these items, scales were created showing the extent to which participants agreed with health professionals about which

interventions would be useful. For depression, there is a professional consensus that GPs, psychiatrists, clinical psychologists, antidepressants, counseling and cognitive-behavior therapy are helpful, while for schizophrenia there is a professional consensus that GPs, psychiatrists, clinical psychologists, antipsychotics and admission to a ward are helpful [7]. Thus, for the depression vignette participants received a score from 0 to 6 according to the number of these interventions endorsed as helpful, while for the schizophrenia vignette they scored from 0 to 5. To equalize the range of scores for the two vignettes, they were then converted to percentages. The questionnaire next assessed stigmatizing attitudes using a social distance scale [8]. Social distance was measured by asking how willing the participant would be to: Move next door to Mary/John; Spend an evening socializing with Mary/John; Make friends with Mary/John; Have Mary/John start working closely with you on a job; Have Mary/John marry into your family. Each question was rated on the following scale: 1. Definitely willing, 2. Probably willing, 3. Probably unwilling, 4. Definitely unwilling. Responses were summed to give a score ranging from 5 to 20. Finally, the questionnaire asked "Have you ever had a problem similar to Mary's/John's?" and "Has anyone in your family or close circle of friend ever had a problem similar to Mary's/John's?".

Post-test and follow-up questionnaires involved the same vignette that was randomly assigned at pre-test. However, the post-test questionnaire excluded the sociodemographic questions and questions related to personal or family mental health problems, confidence in providing help and actual help provided. The latter questions were excluded because it was believed that 6 months were required in order to see the effects of the course in daily life. The follow-up questionnaire was the same as the pre-test one except that the socio-demographic questions were excluded.

Ethics

The Chair of the Australian National University Human Research Ethics Committee advised that the evaluation work fell under the definition of quality assurance and therefore did not require formal approval by the Committee. The methods of evaluation conformed to the Helsinki Declaration.

Statistical analysis

Scale scores were analyzed by analysis of variance in which time of measurement (pre, post, follow-up) was a repeated measures factor and type of vignette (depression or schizophrenia) was an independent groups factor. Dichotomous variables were analyzed using the McNemar test when two time points had to be compared (pre, follow-up) and Cochran's Q test when three time points had to be compared (pre, post, follow-up).

The analysis was carried out according to intention-to-treat principles, so that all persons who completed a pre-test questionnaire were included, even if they subsequently dropped out. In such cases, the pre-test score was substituted for the missing value, so that no improvement was assumed.

Table 1: Characteristics of participants

Characteristic	% Frequency
Female	84.3
Age group	
18–39 years	23.8
40–59 years	61.2
60+ years	15.0
University degree	44.2
Aboriginal	0.5
English not first language	10.0
Mental health consumer	12.9
Carer of person with mental health problem	25.7
Health service provider	31.0
Law enforcement officer	1.0
Educator	12.9

Table 2: Reasons for doing course

Reason	% Frequency
Reasons related to workplace	41.6
Reasons relating to family or close friends	21.3
Reasons relating to own mental health status	6.7
Duty as a citizen	4.8
Just interested	24.3

Results

Participants' characteristics

Of the 210 participants who began the course, 190 attended all three sessions, 14 attended two sessions and 6 attended one session. Some participants who completed the course chose not to return a questionnaire at post-test or follow-up. Consequently, questionnaires were available from all participants at pre-test, 168 at post-test and 166 at follow-up.

Table 3: Percent correctly recognizing the disorder in a vignette

Type of vignette	Pre-course	Post-course	6 Month Follow-up	P-value[1]
Depression	91.4	95.2	93.3	.277
Schizophrenia	56.6	76.4	67.9	.000
Both	73.8	85.7	80.5	.000

[1] Cochran's Q exact test

Table 4: Changes in beliefs about treatment and in social distance. Mean scores (and SDs) on scales measuring (a) beliefs about treatment that are concordant with health professionals, and (b) social distance from person in vignette

Scale	Pre-course	Post-course	6 Month Follow-up	P-value[1]
Beliefs About Treatment				
Depression	79.65 (25.01)	89.90 (17.90)	87.98 (21.22)	
Schizophrenia	74.34 (25.56)	88.49 (17.88)	85.47 (22.17)	
Both	76.97 (25.37)	89.19 (17.86)	86.71 (21.69)	.000
Social Distance				
Depression	8.05 (2.47)	7.48 (2.36)	7.54 (2.28)	
Schizophrenia	10.47 (2.83)	9.86 (2.81)	10.02 (3.12)	
Both	9.27 (2.92)	8.69 (2.85)	8.79 (3.00)	.000

[1] Repeated measures analysis of variance. There were no significant interactions with type of vignette.

Table 1 shows the sociodemographic characteristics of the participants. They were largely middle-aged women and tended to be well educated. Many were carers or health service providers. When the health service providers were asked to state their occupation, the biggest groups were "support worker/respite care/administration" (n = 29/65) and "nurse" (n = 15/65). Table 2 shows the reasons stated for doing the course, with reasons related to the workplace being the most common.

Perception of mental health problem in self or family

Participants were asked at pretest and follow-up about whether they themselves had ever experienced a mental health problem or whether anyone in their family had. The percentage reporting these increased from 41.4% to 47.4% for self (P = .050, 2-tailed McNemar exact test) and from 73.4% to 79.0% for family (P = .052).

Recognition of disorder in vignette

Table 3 shows the percent who correctly recognized the disorder in the vignette, with 104 receiving the depression vignette and 106 the schizophrenia vignette. For the schizophrenia vignette, either "schizophrenia" or "psychosis" was considered correct. For those who received the depression vignette, performance was close to ceiling and no improvement could be found. However, there was improvement for those who received the schizophrenia vignette and also when both groups were combined.

Beliefs about treatments

Table 4 shows the mean score on the scale measuring whether beliefs about treatment are concordant with those of health professionals. There was a change over occasions for both vignettes with beliefs becoming closer to those of professionals (significant linear trend in analysis of variance), but also a tendency for beliefs to revert somewhat at follow-up (as indicated by a significant quadratic trend).

Social distance

Table 4 also shows the mean score on the social distance scale. As would be expected, those who received the schizophrenia vignette expressed greater social distance than those who received the depression vignette. However, social distance decreased over occasions for both groups (significant linear trend in analysis of variance), with some increase again at follow-up (significant quadratic trend).

Table 5: Changes in confidence and help provided to others

Outcome	Before	After	P-value[1]
% Feeling confident in helping someone ("moderately", "quite a bit" or "extremely")	62.2%	83.3%	.000
% Had contact with anyone with mental health problem[2]	88.5%	89.0%	1.00
% Provided help ("some" or "a lot")	54.5%	61.9%	.036
% Advised professional help	14.6%	9.0%	.052
% Gave multiple types of help	45.6%	52.2%	.085

[1]McNemar exact test, 2-tailed [2]Although the percent having some contact did not change, the mean number contacted decreased from 6.41 to 5.26, P = .034 in analysis of variance

Help provided to others

Table 5 shows data on confidence in providing help and actual help provided to others during the 6 months before the start of the course compared to the 6 months after the end of the course. Participants expressed increased confidence in providing help. Although they were not more likely to have contact with someone with a mental health problem, they reported that relatively more help was provided. There was also a non-significant trend towards providing multiple kinds of help, but surprisingly there was a decrease (non-significant) in the percent advising professional help.

Discussion

This evaluation has found several benefits from Mental Health First Aid training. The course improved the ability to recognize a mental disorder in a vignette, changed beliefs about treatment to be more like those of health professionals, decreased social distance (stigmatizing attitudes), increased confidence in providing help to someone with a mental health problem, and increased the amount of help provided to others. All these changes were found with a conservative intention-to-treat analysis. In this type of analysis, those who did not answer a questionnaire at post-test or follow-up were assumed to show no benefit from the course.

On the negative side, participants were less likely to advise seeking professional help when they provided first aid to someone. Although this change failed to reach the conventional significance level (P = .052), it merits comment because it is contrary to the training given in the course to encourage the person with the mental health problem to seek professional help. A possible reason may be that some members of the public decided to participate in the course because they had had recent contact with a person having a mental health problem. Following the course, new contacts may have been fewer and hence there was less opportunity to recommend professional help. One could imagine, for example, the situation of a family carer who enrolled in the course to gain better helping skills, but had no contacts with additional people having mental health problems following the course. Consistent with this interpretation, participants reported having contact with significantly fewer people with mental health problems following the course. Nevertheless, the participants reported that the degree of help they provided was greater after the course.

A potential criticism of Mental Health First Aid training for the public is that it will lead to the labelling of ordinary life problems as mental disorders. To check on the possibility of increased labelling, we asked participants about whether they themselves or members of their family had ever experienced a mental health problem. We found trends towards an increase, with P-values of .050 and .052, which are unlikely to be due to a true change in lifetime prevalence over a six month period, so must reflect increased labelling. However, the increases were small in magnitude and are appropriate given that many mental disorders are not recognized and professionally treated [1].

There are several limitations of the present evaluation study. The major limitation is the lack of a control group. There is no reason to expect that knowledge, attitudes and behavior would improve over time without training. However, it is possible that repeated testing alone produced some change or that the participants were biased towards reporting improvements to please the researchers. To overcome this limitation, we are currently carrying out randomized controlled trials with wait-list control groups. Another limitation is that the participants were largely well-educated women. We do not know whether the findings can be generalized to the broader population. It is also not known whether the intervention increased access to care or produced other benefits to people with mental health problems, since the potential beneficiaries of Mental Health First Aid could not be directly assessed.

As an approach to improving mental health literacy, Mental Health First Aid contrasts with broad-scale community

education campaigns such as the Defeat Depression Campaign in the UK [9], the Depression Awareness Recognition and Treatment (DART) program in the USA [10] and the TIPS project in Norway [11]. It aims to give more intensive education to a smaller number of interested people rather than less intensive education of the whole community. Of course, these contrasting approaches complement each other. However, a major problem with all mental health literacy campaigns is their sustainability. They require a large amount of government funding and generally run for only a few years. However, Mental Health First Aid has the advantage of being potentially sustainable in the long term. Just like conventional first aid courses, it can be run on a fee-for-service basis and requires no long-term government commitment. Mental Health First Aid was initially funded by a grant from the Australian Capital Territory government, but now that this has ended the course is being run as a fee-for-service program and demand continues, particularly from workplaces.

Conclusions

Mental Health First Aid training appears to be effective in improving mental health literacy. It is an approach which could be widely applied in the same way as conventional first aid courses. The present evaluation of Mental Health First Aid has concerned the first 210 participants in the public courses. However, the course has been more popular than these numbers indicate, with approximately 1500 persons trained over an 18-month period out of a total adult population in the Australian Capital Territory (Canberra) of around 230,000 adults. Demand for the course shows no sign of abating and we believe it would be feasible to train 2% of the adult population. If extended a whole country, such a course could have a significant public health impact.

Competing interests

None declared.

Authors' contributions

Betty A Kitchener developed and taught the Mental Health First Aid course, co-developed the evaluation questionnaire, collected the data and co-wrote the manuscript.

Anthony F Jorm had input into the content of the Mental Health First Aid course, co-developed the evaluation questionnaire, analyzed the data and co-wrote the manuscript.

Acknowledgements

The development of the Mental Health First Aid course was funded by a tender from ACT Health and Community Care. The course manual has been printed with a generous donation from Jennie Thomas in memory of her husband Philip Emlyn Thomas. Claire Kelly set up the data file for the evaluation.

References

1. Andrews G, Henderson S, Hall W: **Prevalence, comorbidity, disability and service utilisation. Overview of the Australian National Mental Health Survey.** *Br J Psychiatry* 2000, **178**:145-53
2. Jenkins R, Lewis G, Bebbington P, Brugha T, Farrell M, Gill B, Meltzer H: **The National Psychiatric Morbidity surveys of Great Britain – initial findings from the household survey.** *Psychol Med* 1997, **27**:775-789
3. Jorm AF: **Mental health literacy: public knowledge and beliefs about mental disorders.** *Br J Psychiatry* 2000, **177**:396-401
4. McNair BG, Highet NJ, Hickie IB, Davenport TA: **Exploring the perspectives of people whose lives have been affected by depression.** *Med J Aust* 2002, **176**:S69-S76
5. Kitchener BA, Jorm AF: **Mental Health First Aid Manual.** *Canberra: Centre for Mental Health Research* 2002
6. Jorm AF, Korten AE, Jacomb PA, Christensen H, Rodgers B, Pollitt P: **"Mental health literacy": a survey of the public's ability to recognise mental disorders and their beliefs about the effectiveness of treatment.** *Med J Aust* 1997, **166**:182-186
7. Jorm AF, Korten AE, Jacomb PA, Rodgers B, Pollitt P, Christensen H, Henderson S: **Helpfulness of interventions for mental disorders: beliefs of health professionals compared with the general public.** *Br J Psychiatry* 1997, **171**:233-237
8. Link BG, Phelan JC, Bresnahan M, Stueve A, Pescosolido BA: **Public conceptions of mental illness: labels, causes, dangerousness, and social distance.** *Am J Public Health* 1999, **89**:1328-1333
9. Paykel ES, Tylee A, Wright A, Priest RG, Rix S, Hart D: **The Defeat Depression Campaign: psychiatry in the public arena.** *Am J Psychiatry* 1997, **154**:59-65
10. Regier DA, Hirschfield RMA, Goodwin FK, Burke JD, Lazar JB, Judd LL: **The NIMH depression awareness, recognition, and treatment program: structure, aims, and scientific basis.** *Am J Psychiatry* 1988, **145**:1351-1357
11. Johannessen JO, McGlashan TH, Larsen TK, Horneland M, Joa I, Mardal S, Kvebaek R, Friis S, Melle I, Opjordsmoen S, *et al*: **Early detection strategies for untreated first-episode psychosis.** *Schizophr Res* 2001, **51**:39-46

Pre-publication history

The pre-publication history for this paper can be accessed here:

http://www.biomedcentral.com/1471-244X/2/10/pre-pub

Developmental Psychology
2015, Vol. 51, No. 1, 52–66

0012-1649/15/$12.00 http://dx.doi.org/10.1037/a0038454

Enhancing Cognitive and Social–Emotional Development Through a Simple-to-Administer Mindfulness-Based School Program for Elementary School Children: A Randomized Controlled Trial

Kimberly A. Schonert-Reichl, Eva Oberle, Molly Stewart Lawlor, David Abbott, and Kimberly Thomson
University of British Columbia

Tim F. Oberlander and Adele Diamond
University of British Columbia and Children's Hospital, Vancouver, British Columbia, Canada

The authors hypothesized that a social and emotional learning (SEL) program involving mindfulness and caring for others, designed for elementary school students, would enhance cognitive control, reduce stress, promote well-being and prosociality, and produce positive school outcomes. To test this hypothesis, 4 classes of combined 4th and 5th graders ($N = 99$) were randomly assigned to receive the SEL with mindfulness program versus a regular social responsibility program. Measures assessed executive functions (EFs), stress physiology via salivary cortisol, well-being (self-reports), prosociality and peer acceptance (peer reports), and math grades. Relative to children in the social responsibility program, children who received the SEL program with mindfulness (a) improved more in their cognitive control and stress physiology; (b) reported greater empathy, perspective-taking, emotional control, optimism, school self-concept, and mindfulness, (c) showed greater decreases in self-reported symptoms of depression and peer-rated aggression, (d) were rated by peers as more prosocial, and (e) increased in peer acceptance (or sociometric popularity). The results of this investigation suggest the promise of this SEL intervention and address a lacuna in the scientific literature—identifying strategies not only to ameliorate children's problems but also to cultivate their well-being and thriving. Directions for future research are discussed.

Keywords: social and emotional learning, well-being, mindfulness, intervention, prosociality

Supplemental materials: http://dx.doi.org/10.1037/a0038454.supp

It is increasingly being recognized that effective education includes practices that bolster students' social–emotional competencies in tandem with their academic knowledge (Committee on Defining Deeper Learning and 21st Century Skills, 2012; Schonert-Reichl & Weissberg, 2014). Recent years have witnessed increased empirical attention to the school-based promotion of students' social and emotional competence as educators, parents, policymakers, and other societal agencies contemplate solutions to persistent problems during late childhood and early adolescence such as poor academic motivation (Eccles & Roeser, 2009; Roeser & Eccles, 2014), school dropout (Battin-Pearson et al., 2000), school bullying and aggression (Swearer, Espelage, Vaillancourt, & Hymel, 2010), and mental health problems (Committee on the Prevention of Mental Disorders and Substance Abuse Among Children, Youth, and Young Adults: Research Advances and Promising Interventions, 2009). The reality is that today's schools are facing increased pressure to improve academic performance, while also giving attention to children's social–emotional needs, and are thus expected to do more than ever before with diminishing resources (Jones & Bouffard, 2012). Given competing de-

Kimberly A. Schonert-Reichl, Department of Educational and Counselling Psychology, and Special Education and Human Early Learning Partnership, University of British Columbia, Vancouver, British Columbia, Canada; Eva Oberle and Molly Stewart Lawlor, Department of Educational and Counselling Psychology and Special Education, University of British Columbia; David Abbott, Department of Psychiatry, University of British Columbia; Kimberly Thomson, Human Early Learning Partnership, University of British Columbia; Tim F. Oberlander, Human Early Learning Partnership and Department of Pediatrics, University of British Columbia, and Department of Pediatrics, Children's Hospital, Vancouver, British Columbia, Canada; Adele Diamond, Department of Psychiatry, University of British Columbia, and Department of Psychiatry, Children's Hospital, Vancouver.

Eva Oberle is now at the Department of Psychology, University of Illinois at Chicago.

This research was supported by grants from the Mind and Life Institute (Hadley, MA), the Hawn Foundation (Miami Beach, FL), and the Human Early Learning Partnership (University of British Columbia). We thank W. T. Boyce, G. Miller, A. Norenzayan, A. Reichl, V. Smith, and R. Roeser for their excellent feedback and guidance on earlier versions of this article. We are grateful to the student participants and their parents and to the teachers and administrators in the school district for their participation in this project.

Correspondence concerning this article should be addressed to Kimberly A. Schonert-Reichl, Department of Educational and Counselling Psychology, and Special Education, 2125 Main Mall, University of British Columbia, Vancouver, BC, V6T 1Z4, Canada. E-mail: kimberly.schonert-reichl@ubc.ca

mands on time and resources, it is essential that educators find and implement relatively short-term, evidence-based curricular approaches that optimize learning and social adaptation while also proving to be cost-effective (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011).

Social–Emotional Learning, Executive Function, and Mindfulness

Several models have been proposed for understanding the mechanisms that mitigate problems and promote resilience in children. The bulk of the current theoretical and empirical literature supports a social–emotional competence perspective in which children with positive social and emotional skills demonstrate resiliency when confronted with stressful situations (e.g., Durlak et al., 2011; Luthar & Brown, 2007). Such competencies and protective factors include self-awareness, self-management, social awareness, relationship skills, and responsible decision making (Collaborative for Academic, Social, and Emotional Learning, 2013). A meta-analysis of school-based social and emotional learning (SEL) programs provided evidence that such programs can develop the skills and outcomes of interest in the present study—social and emotional competencies and their influence on well-being and academic success (Durlak et al., 2011).

One approach to promoting children's well-being is based on recent innovations in developmental neuroscience and, specifically, the importance of executive function for resilience and developmental success (Shonkoff, Boyce, & McEwen, 2009). Mounting evidence suggests that *executive functions* (EFs: cognitive control abilities depending on the prefrontal cortex [PFC] that organize, sequence, and regulate behavior) and *self-regulation* (i.e., the ability to regulate resources in the service of achieving goals) predict children's altruistic behavior (Aguilar-Pardo, Martínez-Arias, & Colmenares, 2013), school achievement and social–emotional competence (Diamond, 2012), and long-term life success (Moffitt et al., 2011). EF skills strengthen significantly throughout childhood and adolescence and can be influenced by environmental enrichment (Best & Miller, 2010; M. C. Davidson, Amso, Anderson, & Diamond, 2006).

One proposed way to support the development of EFs and self-regulation during childhood is through practicing mindfulness (Zelazo & Lyons, 2012). Defined as a mental state or trait, as opposed to a set of practices (Roeser, in press), *mindfulness* refers to an ability to focus on thoughts, feelings, or perceptions that arise moment to moment in a cognitively nonelaborative, and emotionally nonreactive, way (i.e., "paying attention in a particular way, on purpose, in the present moment, and nonjudgmentally," Kabat-Zinn, 1994, p. 4). Being mindful requires the cognitive control strategies described earlier as EFs and can be contrasted with nonconscious attention and acting on the basis of "automatic pilot" (e.g., Langer & Moldoveanu, 2000). Mindfulness, conceived of as a set of practices to cultivate this state of mind, typically includes meditation exercises and the bringing of mindful awareness to daily activities like eating. These practices are designed to cultivate focused attention and EF, coupled with a nonjudgmental, curious attitude toward moment-to-moment experience (Kabat-Zinn, 2003). Both theory and empirical research indicate that mindfulness practices in adults can increase awareness of moment-to-moment experience and promote reflection, self-regulation, empathy, and caring for others (Hölzel et al., 2011). Moreover, mindfulness training has been found to improve adults' regulation of stress and its underlying physiology (Marcus et al., 2003; Tang et al., 2007).

Despite this empirical support for mindfulness training with adults, the question of whether mindfulness training shows equivalent benefits for children remains largely unanswered. The relatively meager research examining mindfulness training with school-age children has yielded promising findings (for reviews, see Greenberg & Harris, 2012; Zoogman, Goldberg, Hoyt, & Miller, 2014). To date, however, this work has focused mostly on reducing mental health problems like depressive symptoms (Biegel, Brown, Shapiro, & Schubert, 2009; van de Weijer-Bergsma, Formsma, de Bruin, & Bögels, 2012). Less research has examined mindfulness training in relation to improving stress regulation, well-being, learning, or prosocial behaviors among typically developing children in regular elementary school classrooms.

Accordingly, in this study, we examined how a classroom-based SEL program (MindUP; Hawn Foundation, 2008) that incorporates mindfulness practices may promote children's cognitive control abilities and regulation of stress, well-being, and prosocially. The MindUP curriculum is derived from psychological theory and informed by research in the fields of developmental neuroscience (Diamond, 2009, 2012), contemplative science and mindfulness (Roeser & Zelazo, 2012), SEL (Greenberg et al., 2003), and positive psychology (Lyubomirsky, Sheldon, & Schkade, 2005). The curriculum includes 12 lessons, and each component of the program builds on previous skills learned, moving children from focusing on subjective sense-based experiences (e.g., mindful smelling, mindful tasting) to cognitive experiences (e.g., taking others' perspectives), to actions such as the practice of gratitude and the doing of kind things for others in the home, classroom, and community. To date, little is known about the effectiveness or "value-added" benefits of an SEL program that incorporates mindfulness practices, self-reflective exercises, and actions involving caring for others with regard to the development of children's EFs, regulation of stress physiology, school achievement, or enactment of prosocial behavior.

Late Childhood Period

We focus on late childhood and the upper elementary school grades in this study. Collins (1984) suggested that it is during this developmental period that children's personalities, behaviors, and competencies begin to consolidate into forms that persist into adolescence and adulthood. We know that the late childhood years, just before the transitional period of puberty, are a time of considerable synaptic overproduction in the prefrontal cortex and that this appears to set the stage for advances in EFs during and following this period (Giedd, 2008). Relatedly, research also suggests these years are an important time in the transformation of so-called "top-down" and "bottom-up" information processing strategies in the regulation of behavior (Zelazo & Carlson, 2012). Changes in neural/mental organization leading up to puberty, for instance, are associated with significant changes in self-regulatory and self-reflective capacity (Zelazo & Carlson, 2012), the abstract nature of self-representations that comprise the self system (Harter, 2006; Roeser & Pinela, 2014), and moral reasoning (e.g., Nucci & Turiel, 2009). We know, for instance, that it is during these years

that children become less egocentric and are able to consider the feelings and perspectives of others—they develop a sense of right and wrong and have the capacity to act prosocially in accordance with their higher levels of self- and social understanding (Eisenberg, Fabes, & Spinrad, 2006).

Providing enrichment activities that support the development of healthy forms of self-regulation and reflection, malleable self-representations (e.g., one's intellectual ability as modifiable through effort), and prosocial dispositions could ameliorate or even prevent some of the mental health and school-linked problems that often arise around the transition to secondary school and puberty (see Eccles & Roeser, 2009). Indeed, SEL interventions that include mindfulness practices might be especially well suited for such a task by familiarizing young people with their changing bodies and minds and by affording them conscious and compassionate ways of relating to their changing natures and those of their peers (e.g., Roeser & Pinela, 2014). Indeed, SEL programs that offer these skills to all students in classroom settings may be instrumental in creating more caring communities of learning by having students and teachers model these qualities for one another. Yet to date there have been no studies of sufficient scope to examine this premise. Thus, in the present study, we relied on peer reports of others' behaviors in addition to teacher, self-, and behavioral/biological measures.

Present Study Design

The present randomized controlled trial study was conducted to test whether an SEL program that incorporates mindfulness practices (MindUP; Hawn Foundation, 2008) would lead to improvements in EFs, stress regulation, social–emotional competence, and school achievement in fourth and fifth grade children. An active control group of fourth and fifth grade children who received a *business as usual* (BAU) social responsibility program were used as a comparison. We examined group differences between treatment and BAU conditions on multiple outcomes, including EFs, hypothalamic–pituitary–adrenocortical (HPA) regulation, social–emotional competence, and end-of-year math grades. To our knowledge, there are no studies in which neuropsychological, biological, and social–emotional competence measures have been examined simultaneously in relation to the effectiveness of an SEL program for children. We hypothesized that when compared with students in the BAU condition, MindUP program students would show positive changes from pretest to posttest on all measures, with the exception of a measure of social responsibility. We hypothesized that the groups would not differ on a measure of social responsibility given a focus on this construct in both conditions.

Method

School Selection and Randomization

The evaluation took place in a public school district serving approximately 35,000 students in a suburban, predominantly middle-class community near a large western Canadian city. Four elementary schools in the district—equivalent on school size, achievement level, socioeconomic status (SES), and ethnic and racial diversity—were first identified as potential sites for the study because of their focus on the promotion of students' social responsibility. The neighborhoods in which schools were located were considered to be of similar population density and SES.

The research protocol was described to the four principals and the teachers of combined fourth and fifth grade classrooms at each school. Given the potential for diffusion effects (Craven, Marsh, Dubes, & Jayasinghe, 2001), only one classroom in each school was considered eligible for participation. Teachers were aware that once they decided to participate, their classroom had a 50% chance of being randomized as a comparison classroom. All principals and teachers agreed to participate. After the collection of baseline data, randomization was done by a coin flip that assigned two of the four classrooms to receive the MindUP curriculum and two to receive the district program that focused on the promotion of social responsibility (BAU condition).

Participants

Children. The recruited sample included 100 fourth and fifth grade children in classrooms in which approximately half of the children were from Grade 4 and half from Grade 5. One child moved away prior to posttest data collection, resulting in a final sample size of 99 children. Participants' ages ranged from 9.00 to 11.16 years (M = 10.24, SD = 0.53). The average income for the neighborhoods in which each of the four schools was located approximated the median annual income for Canada ($52,800 CAD; Statistics Canada, 2006). Regarding children's family composition, 84% reported living in two-parent homes (including both biological and step-parent families), 9% reported living with mother only, and the remainder reported living in dual-custody arrangements (i.e., half time with mother, half time with father). With regard to language, 66% of the children reported that English was their native language. For the remaining children, the majority reported that their language at home was of East Asian origin (25%; e.g., Korean, Mandarin, Cantonese), and the remaining 10% indicated a range of other languages (e.g., Spanish, Russian, Polish). This range of language backgrounds in the sample is reflective of the cultural and ethnic diversity of the Canadian city in which this research took place. Following randomization, analyses indicated that the children did not differ across study conditions on baseline demographic characteristics, suggesting that the randomization process was successful (see Table 1). Of the children recruited for participation, 98% received parent or guardian consent and gave assent themselves.

Teachers. The four participating teachers represented comparable experiential and cultural backgrounds. All of the teachers had over 5 years of teaching experience, had obtained a bachelor's degree in education, and had received similar levels of professional development in the promotion of students' social responsibility in their school district. All four teachers reported their ethnic/cultural heritage as European-Canadian.

Interventions

MindUP program. MindUP is a simple-to-administer mindfulness-based education SEL program that consists of 12 lessons taught approximately once a week, with each lesson lasting approximately 40–50 min. The core mindfulness practices in the

Table 1
Summary of Demographic Information by Condition

Variable	MindUP	BAU	Total
Participants (*n*)	48	51	99
Age (years)			
M	10.16	10.31	10.24
SD	0.52	0.52	0.53
Gender			
Female	46%	42%	44%
Male	54%	58%	46%
First language learned (%)			
English	63	68	66
East Asian	27	22	25
Other	10	10	10
Family composition (%)			
Two parents	77	89	84
Single parent	10	7	9
Half mother, half father	10	4	7

Note. BAU = business as usual.

program (done every day for 3 min three times a day) consist of focusing on one's breathing and attentive listening to a single resonant sound. The curriculum includes lessons that promote EFs and self-regulation (e.g., mindful smelling, mindful tasting), social–emotional understanding (e.g., using literature to promote perspective-taking skills and empathy), and positive mood (e.g., learning optimism, practicing gratitude). In addition, the MindUP curriculum includes lessons that involve performing acts of kindness for one another and collectively engaging in community service learning activities. These activities are aimed at changing the ecology of the classroom environment to one in which belonging, caring, collaboration, and understanding others is emphasized to create a positive classroom milieu (e.g., Noddings, 1992; Staub, 1988). Also incorporated in the MindUP intervention model is an ecobehavioral systems orientation (Weissberg, Caplan, & Sivo, 1989) in which teachers generalize the curriculum-based skills throughout the school day and support children's use and internalization of skills to support a positive classroom environment. A more complete description of the MindUP program can be found in the supporting online material.

Social responsibility program. The social responsibility program that represented the BAU condition in this study was informed by guidelines and resources provided by British Columbia's (BC's) Ministry of Education (see ttp://www.bced.gov.bc.ca/perf_stands/social_resp.htm). Since 2001, social responsibility has been identified as one of four performance standards considered to be "foundational" for students in BC (the other performance standards are reading, writing, and numeracy). The framework for BC's Social Responsibility Performance Standards includes a common set of expectations for the development of students along four categories: (a) contributing to classroom and school community (e.g., sharing responsibility for their social and physical environment), (b) solving problems in peaceful ways (e.g., using effective problem-solving steps and strategies), (c) valuing diversity and defending human rights (e.g., treating others fairly and respectfully, showing a sense of ethics), and (d) practicing democratic rights and responsibilities (e.g., knowing and acting on rights and responsibilities [local, national, global]). Further information about the Social Responsibility Performance Standards can be found in the supporting online material.

Procedure

Trained research assistants, blind to teacher and student study conditions, administered all assessments and collected diurnal cortisol samples from students at pre- and posttest. Teacher measures of children's achievement in math were also collected, although teachers, of course, were not blind to the study conditions of students. Administration of EF computer tasks and collection of cortisol samples took place the same week that the surveys were administered. Children were told that they were participating in a research study that was aimed at understanding "children's experiences in school" and "their attitudes and beliefs about their classmates and themselves." Self-report and peer behavioral assessments were administered to students during one 45-min regular class period, and each item on the questionnaire was read aloud while students completed the measures to control for any differences in reading abilities.

Implementation Measures

To assess implementation dosage and quality, teachers implementing the MindUP program were asked to complete surveys. Dosage was assessed by asking teachers to report how many of the 12 MindUP lessons they had completed and detail any omitted part(s) of each lesson. In addition, teachers were asked to track and record daily implementation of the MindUP core practices (breathing and listening) via a lesson daily diary. Teachers implementing the Social Responsibility Performance Standards of the district were also asked to report on the number of activities that they completed each week.

Outcome Measures

Children's outcome measures were derived from five independent sources: (a) behavioral assessments of EF, (b) biological assessments of children's salivary cortisol, (c) child self-reports of well-being and prosociality, (d) peer nominations of prosociality, and (e) year-end teacher-rated math grades collected from school records.

EF measures. To assess EFs, the flanker task and the hearts and flowers version of the dots task were administered (M. C. Davidson et al., 2006; Diamond, Barnett, Thomas, & Munro, 2007). These measures are appropriate for ages 4 through adults and assess all three dimensions of core EF skills. Tasks were presented on a laptop computer using the Presentation program by Neurobehavioral Systems (Berkeley, CA) to present stimuli and record responses. Responses were collected via two input keys on either side of the keyboard. Participants were positioned approximately 50 cm from the screen. The task consisted of three different conditions. Each condition began with specific instructions and a short block of four practice trials. If necessary, the practice trials were repeated to ensure that the participant had understood the task and the condition-specific requirements.

Flanker task. The task consisted of three conditions: (a) standard flanker, (b) reverse flanker, and (c) mixed trials. In the standard flanker condition, the fish were blue. Children were instructed to press the key on the side of the keyboard that represented the direction in which the middle fish was facing, ignoring the two distractor fish on either side of the middle (target)

fish. This task required remembering the rule for the task, regulating attention on the task, and inhibiting distraction from the flanker fish on either side of the target stimuli. In the reverse flanker condition, the fish were pink. In contrast to the previous task, children were instructed to press the key that represented the direction in which the four fish on either side of the central fish were facing. Not only did this task require remembering the new rule for the task and selective attention, it also required the cognitive flexibility needed to change from the strategy used for the standard flanker task. In the third condition, standard flanker (blue fish) and reverse flanker (pink fish) tasks were randomly intermixed, requiring flexible application of the rules for each. This task put a heavy demand on all three core EFs. It required first recalling which rule applied; then focusing one's attention on only the relevant stimuli, registering which direction the relevant fish was or were facing; and finally choosing the correct response. A successful response was followed by positive feedback (cheers such as "yummy" or "yippee" produced by the computer program), whereas an incorrect response was followed by negative feedback (e.g., "oops"). The stimulus presentation time was 1,500 ms, the feedback interval was 1,000 ms, and the interstimulus interval was 500 ms.

Hearts and flowers task. We also administered the hearts and flowers task to measure students' working memory, response inhibition, and cognitive flexibility (Diamond et al., 2007; Wright & Diamond, 2014). This task required students to learn and follow a rule and then to switch to a second rule. Stimulus presentation time was 750 ms, and the interstimulus time interval was 500 ms. In all conditions of this task, a red heart or flower appeared on the right- or left-hand side of the screen. In the congruent condition, one rule applied ("press the key on the same side as the heart"). The incongruent condition required students to remember another rule ("press the key on the side opposite the flower"). However, the incongruent trials also required students to inhibit the natural tendency to respond on the side where the stimulus appeared. In the mixed condition, incongruent and congruent trials were intermixed (taxing all three core EFs).

Scoring of EF tasks. Scores for both accuracy (percentage of correct responses calculated by dividing the number of correct responses by the total number of responses) and reaction time (RT) in milliseconds were calculated. Anticipatory responses—that is, responses that were faster than 200 ms—were considered too fast to be a response to the stimulus (M. C. Davidson et al., 2006) and were thus excluded from the analyses. A response was considered correct if the participant correctly applied the condition-specific rule by pressing the appropriate button on the keyboard and if this occurred no faster than 200 ms after the trial stimulus had appeared and before the trial stimulus had disappeared. Practice trials and the first trial following the practice trials of each block were excluded from analyses. We calculated accuracy and RT for three sets of trials that demanded the greatest EFs in terms of inhibitory control, working memory, and flexiblity: (a) flanker switch trials, (b) reverse flanker trials, and (c) incongruent hearts and flowers trials.

Salivary cortisol. HPA axis activity was assessed by measuring free cortisol in saliva three times within 1 day, relative to awakening, at both pretest and posttest. This method of salivary cortisol collection is consistent with Murray-Close, Han, Cicchetti, Crick, and Rogosch (2008), who examined the association between daily cortisol patterns and aggression using the average of three cortisol samples (morning, prelunch, and afternoon) obtained from school-age children (6–12 years of age) attending a week-long day camp. Note that we assessed children after the cortisol awakening response and, therefore, when cortisol was naturally decreasing in the body. Although additional time points (e.g., awakening, later evening) would have better defined the diurnal pattern, the young age of these children and the emphasis on limiting the assessment burden on them and their caregivers guided the selection of only three time points during the school day.

The salivary cortisol collection was facilitated by research assistants who came into in the participants' classrooms to assist them throughout the collections at 9 A.M., 11:30 A.M., and 2:30 P.M. Participants were instructed to avoid food intake and high physical activity at least a half an hour prior to saliva collection. Teachers modified their classroom schedule and eliminated any physical activity and snacking on the days of cortisol collection. At each assessment period, children were given a short diary to document their time of awakening, last food and liquid consumption, and medication taken that day. To collect the saliva samples, research assistants directed children to put a dental cotton roll in their mouth for 1 min and saturate it in saliva (Salimetrics Oral Swab, State College, PA [https://www.salimetrics.com/]). Research assistants instructed children on how to place the roll into a protective tube using latex gloves to avoid contamination. Cortisol samples were shipped to the Kirschbaum laboratory at the Dresden University of Technology, Dresden, Germany, for analyses. Cortisol concentrations were then determined using a commercial chemiluminescence immunoassay (IBL International, Hamburg, Germany). This assay has a sensitivity of 0.16 ng/ml and intra- and interassay coefficients of variation of less than 12%. The lower concentration limit of this assay was 0.44 nmol/L; intra- and interassay coefficients of variance were less than 8%. Any sample over 50 nmol/L was repeated.

The cortisol data were screened to ensure that each case had complete data for cortisol samples and time since awakening at all time points. We calculated average cortisol output at each of the three time points. Following the procedures outlined by Stetler and Miller (2008), after the cortisol values had been log-transformed, the pattern of cortisol secretion was computed as a linear slope. In this procedure, the cortisol values at each time point were regressed on the number of hours awake. Higher (less negative) values indicated a flatter slope, whereas lower (more negative) values indicated a steeper slope.

Child self-report measures. Child self-report measures included a battery of measures assessing children's empathy and perspective-taking, optimism, emotional control, school self-concept, depressive symptoms, mindfulness, and social responsibility.

Demographic information. To obtain demographic information about the participants, students completed a demographic questionnaire asking them about their grade level, birth date, family composition, and first language learned in the home.

Empathy and perspective-taking. Participants' empathy and perspective-taking were assessed via the Interpersonal Reactivity Index (IRI; Davis, 1983), which had been modified for children (Schonert-Reichl, Smith, Zaidman-Zait, & Hertzman, 2012). The IRI is a self-report measure comprising four seven-item subscales

(perspective-taking, fantasy, empathic concern, personal distress), each of which taps a separate dimension of empathy. Because we were interested in examining intervention effects on dimensions related to social awareness and caring for others, only the empathic concern and perspective-taking subscales were used in the present study. The empathic concern scale assesses the tendency to feel concern for other individuals (e.g., "I often feel sorry for people who don't have the things I have"), whereas the perspective-taking subscale measures the tendency to consider things from others' viewpoints (e.g., "Sometimes I try to understand my friends better by imagining how they think about things"). Participants rated each item on a five-point rating scale (1 = *never*, 5 = *very often*). Scores were computed by averaging item scores within subscales so that higher scores signified greater empathic concern and perspective-taking, respectively. Supportive evidence for the construct validity and reliability of the empathic concern and perspective-taking subscales of the IRI has been obtained in previous research (Davis, 1983), including significant correlations with related constructs in expected directions (Schonert-Reichl et al., 2012). In the present study, Cronbach's alphas at pretest and posttest for the empathy subscale were .80 and .78, respectively, and for the perspective-taking subscale were .65 and .76, respectively.

Optimism. We assessed participants' optimism using a subscale from the Resiliency Inventory (RI), created by Noam and Goldstein (1998) and later modified by Song (2003). The RI was developed specifically as a measure of resilience in adolescents (Noam & Goldstein, 1998) and has also been demonstrated to be cross-culturally robust (Song, 2003). The optimism subscale consists of nine items assessing children's positive perspective on the world and the future in general (e.g., "More good things than bad things will happen to me"). Children were asked to rate each item on a five-point Likert-type scale (1 = *not at all like me*, 2 = *a little bit like me*, 3 = *kind of like me*, 4 = *a lot like me*, 5 = *always like me*). Ratings are averaged, with higher scores representing higher levels of optimism. Previous research has found support for the validity and reliability of the optimism subscale (Noam & Goldstein, 1998; Thomson, Schonert-Reichl, & Oberle, 2014). For the present study, Cronbach's alpha for the optimism subscale was .69 at pretest and .73 at posttest.

Emotional control. Emotional control was assessed with a subscale of the RI, described earlier. The emotional control subscale consists of five items assessing the degree to which the respondent feels he or she has some control over his or her emotional reactivity and emotional displays (e.g., "I stay calm even when there's a crisis"). Ratings on the five items are averaged, with higher scores representing higher levels of emotional control. Evidence supporting the reliability and validity of the emotional control subscale of the RI has been reported (Noam & Goldstein, 1998; Song, 2003). In the present study, Cronbach's alphas for the emotional control subscale in the present study at pretest and posttest were .57 and .60, respectively.

School self-concept. The school self-concept subscale from Marsh's Self-Description Questionnaire (SDQ; Marsh, Barnes, Cairns, & Tidman, 1984) was used to measure students' self-rated abilities, enjoyment, and interest in school subjects. This subscale includes items such as "I am good at school subjects" and "I look forward to all school subjects." Items are rated on a five-point scale (1 = *never*, 5 = *always*). Ratings are averaged, with higher scores indicating higher levels of school self-concept. Evidence supporting the validity of the SDQ has been reported, and internal consistencies (Cronbach's alphas) for each of the subscales in the questionnaire have ranged from .80 to .92 (Marsh et al., 1984). In the present study, Cronbach's alphas at pretest and posttest for this subscale were .82 and .83, respectively.

Depressive symptoms. Students' depressive symptoms were measured using the Seattle Personality Questionnaire for Children (SPQC; Kusché, Greenberg, & Beilke, 1988). The scale comprises four constructs: (a) conduct problems, (b) anxiety, (c) somatization, and (d) depressive symptoms. For the purposes of the present study, we used only the 11-item depressive symptoms subscale (e.g., "Do you feel unhappy a lot of the time?"). Items are scored on a four-point Likert-type scale (1 = *not at all*, 4 = *always*). Ratings are then averaged, with higher scores representing higher levels of depressive symptoms. Evidence exists supporting the validity and reliability of the depressive symptoms subscale of the SPQC (Kusché et al., 1988). In the current sample, Cronbach's alphas at pretest and posttest were .80 and .84, respectively.

Mindfulness. The Mindful Attention Awareness Scale adapted for children (MAAS-C; Lawlor, Schonert-Reichl, Gadermann, & Zumbo, 2014) was used to assess individual differences in the frequency of mindful states over time. In developing the original version of the MAAS for adults (Brown & Ryan, 2003), the authors proposed that "statements reflecting mindlessness are likely more accessible to most individuals, given that mindless states are much more common than mindful states" (p. 826). Hence, items on the MAAS reflect mindless states (e.g., "I could be experiencing some emotion and not be conscious until sometime later." "I do jobs or tasks automatically without being aware of what I am doing"). The MAAS-C is a 15-item measure that has been modified for use with younger populations by (a) altering language to be age appropriate and (b) changing the six-point Likert-type scale to read in a more child-friendly format (1 = *almost never*, 2 = *not very often at all*, 3 = *not very often*, 4 = *somewhat often*, 5 = *very often*, 6 = *almost always*). On analysis, items were reverse-scored and averaged, with higher scores indicating higher mindfulness. Lawlor et al. (2014) reported the MAAS-C to be a reliable and valid instrument for children, with a reported internal consistency of .84 as assessed via Cronbach's alpha. For the present investigation, Cronbach's alpha was good, with pretest and posttest alphas both equaling .84.

Social responsibility. Social responsibility was assessed with a subscale of the Social Goals Questionnaire (Wentzel, 1993). The Social Goals Questionnaire comprises two subscales measuring prosocial goals and social responsibility. In the present study, only the seven-item social responsibility subscale was used because of the focus on social responsibility promotion in the MindUP and BAU conditions. Items on the subscale assess, among other things, how students try to "keep promises [they] have made to other kids," "be nice to other kids when something bad has happened to them," and "be quiet when other kids are trying to study" Students indicate their answers on a Likert-type scale (1 = *never*, 5 = *always*), with higher scores indicating higher social responsibility goals. Previous research has found support for the validity and reliability of the social responsibility subscale in early adolescents (Wentzel, 1993). In the present study, Cronbach's alphas at pretest and posttest were .60 and .73, respectively.

Peer-Report Measures

Peer nominations of prosociality. Following the procedures outlined by Parkhurst and Asher (1992), peer nominations were used to obtain independent assessments of prosociality, whereby children nominated their classmates who fit particular behavioral characteristics. This methodology is consistent with published investigations in which peers' ratings of behaviors are considered to be a reliable and valid way in which to assess students' social behaviors in a school context (Schonert-Reichl et al., 2012; Wentzel, Barry, & Caldwell, 2004).

Unlimited and cross-gender peer nominations were used to obtain independent assessments of children's social behavior. Five types of *prosocial* behaviors ("shares and cooperates," "trustworthiness," "helps other kids when they have a problem," "kind," "understands other kids' point of view") and two types of *aggressive/antisocial* behaviors ("breaks rules," "starts fights") were assessed. For each question, children were asked to "circle the names of any of your classmates who" fit each of the behavioral descriptions. Below each written question, children were given a roster of all their classmates participating in the research. Children could circle as many or as few names as they wanted. Children's nominations were standardized within each classroom, and a proportional nominations score was calculated per child for each of the behaviors. Because data collection took place midway into the school year, it was reasonable to assume that students knew one another well enough to make valid nominations.

Peer nominations of peer acceptance. Children's level of acceptance by peers (one item: "would like to be in school activities with") was assessed using the same nomination sociometric procedure used for obtaining measures of behaviors (e.g., Oberle, Schonert-Reichl, & Thomson, 2010). Level of acceptance was scored in the same manner described earlier.

Achievement measure. Math achievement was assessed via students' end-of-the-school-year math grades obtained from school records. The schools provided only math grades for 89 of the 99 participating students. Grades were recorded on a continuous scales (1 = *C*−, 9 = *A*+).

Analytic Plan

To assess changes in students' EFs over time by condition, we examined both accuracy and speed of responding (RTs in ms) as dependent measures. Because accuracy data are binary at the individual trial level, a generalized estimating equation using a binary logistic equation was used to compare the difference in accuracy between the MindUP and BAU children, with covariates for pretest accuracy, age, gender, and English as a second language (ESL). RT at posttest was examined via multilevel modeling (MLM) analyses, because the response trials in the EF tasks were nested under different blocks that represented different response rules (see the EF task descriptions), with covariates for group, RT at the pretest, accuracy at pretest, age, gender, ESL, block condition, Group × Block interaction, and accuracy of the response (correct/incorrect). All covariates were entered as fixed effects in the model. The parameters were estimated via restricted maximum likelihood. The covariance structure was set to compound symmetry. Individual trials within the tasks were modeled as repeated effects.

To assess changes in students' regulation of stress physiology over time by condition, we used analyses of covariance (ANCOVAs) to examine changes in students' patterns of daily cortisol computed as linear slopes.

To address changes in the sets of measures we collected from student self-report and peer nomination, and to do so in a way that accounted for multicollinearity in these measures by informant, we used multivariate analyses of covariance (MANCOVAs), followed by ANCOVAs. When significant omnibus intervention effects were found with MANCOVA on these various sets of measures from different informants, we then used generalized linear model analyses of covariance in which difference, or "change," scores served as the dependent variable. Statistically comparable to performing a repeated measures analysis, change scores provide an unbiased estimate of true change regardless of baseline value (Zumbo, 1999). Change scores can be used as the dependent variable in an analysis of variance (ANOVA) and are seen as an alternative to ANCOVA when the researcher is interested in examining the direction of change from pretest to posttest, as was the case here (Tabachnick & Fidell, 2001).

Because we only had teacher-reported math grades from the end of the school year, we examined differences between groups via an ANCOVA, in which math grades served as the dependent variable, and group (MindUP vs. BAU) served as the independent variable. In all analyses, children's gender, age, and ESL status were controlled as potential confounds. Where appropriate, effect sizes (Cohen's *d*s) were calculated to provide information about the magnitude of program effects. According to the criteria proposed by Cohen (1988), an effect size of .20 is considered small, .50 is considered medium, and .80 is considered a large effect.

Results

Implementation Data

Review of implementation surveys and implementation diaries at the end of the school year indicated that the two teachers implementing the MindUP program had completed all 12 (100%) of the MindUP lessons. With regard to core breathing practices, which are recommended to be done three times a day (morning, after lunch, end of day): Teacher 1 reported completing an average of 81% of the practices in a given week, and Teacher 2 reported completing an average of 95% of the practices in a given week. The two teachers in the BAU condition also reported implementing activities from the social responsibility program for each of the 12 weeks.

Outcome Data

EFs. The two dependent measures for EFs were percentage of correct responses (accuracy) and RT in ms. Analyses of baseline differences in accuracy revealed no significant difference between that the MindUP and BAU children on the flanker switch trials (86% [*SE* = .16] and 87% [*SE* = .15], respectively), $\chi^2(1, N = 99) = 0.06$, *ns*; flanker versus reverse flanker trials (91% [*SE* = .09] and 91% [*SE* = .00], respectively), $\chi^2(1, N = 99) = 0.02$, *ns*; or hearts and flowers congruent versus incongruent trials (84% [*SE* = .11] and 80% [*SE* = .13], respectively), $\chi^2(1, N = 99) = 2.32$, *ns*. Analysis of posttest differences in accuracy (controlling

for pretest accuracy, gender, age, and ESL [note that percentages reported are adjusted means]) revealed similar nonsignificant differences between groups: flanker switch trials (73% [*SE* = .23] and 80% [*SE* = .17], respectively), $\chi^2(1, N = 99) = 3.15$, *ns*; flanker versus reverse flanker trials (81% [*SE* = .17] and 85% [SE = .13], respectively), $\chi^2(1, N = 99) = 2.31$, *ns*; and hearts and flowers congruent versus incongruent trials (82% [*SE* = .12] and 79% [*SE* = .13], respectively), $\chi^2(1, N = 99) = 1.45$, *ns*.

Pretest, posttest, and adjusted posttest means and standard deviations for the EF RTs by group are provided in Table 2. An overview of the estimated means and the results of the hypotheses tests are presented in Table 3. MLM of the EF data revealed that MindUP children were faster, but no less accurate, than comparison children on all three EF tasks at posttest (see Figure 1). For the flanker switch trials task at posttest, MindUP children showed significantly shorter RTs than comparison children, $F(1, 92) = 4.32$, $p = .04$, $d = -.21$, and outperformed comparison children on incongruent flanker and reverse flanker trials as well, indicating a greater ability to selectively attend and inhibit distraction, $F(1, 92) = 5.54$, $p = .02$, $d = -.31$.

Similar results were obtained for the hearts and flowers task: At posttest, the MindUP children showed significantly shorter RTs on trials in the hearts and flowers incongruent condition than did comparison children, $F(1, 87) = 4.00$, $p = .04$, $d = -.22$ but were not less accurate, as reported earlier.

Salivary cortisol. A series of ANCOVAs were conducted to check for mean baseline differences between the MindUP and BAU children on cortisol output at morning arrival, prelunch, and predismissal, controlling for age, gender, and ESL. No significant differences were found (see Table 4). To examine intervention effects on HPA axis activity over the course of a school day, we calculated the cortisol change across the day (slope) as the coefficient of a single child's cortisol measures regressed on time of cortisol data collection (i.e., mean log 9 A.M. to mean log 3 P.M. cortisol), taking into account time since awakening.

We used slope difference scores (posttest mean minus pretest mean) as our dependent variable because of our interest in examining the *direction of change* and not simply differences at posttest (Zumbo, 1999). At pretest, MindUP and BAU children exhibited a similarly steep slope (*M*s = −.05 and −.06, *SD*s = .05 and .05, respectively), $F(3, 94) = 1.31$, *ns*. ANCOVA with group (intervention vs. BAU) as the independent variable and difference score in slope from pretest to posttest as the dependent variable (controlling for age, gender, and ESL) revealed that MindUP children's average slope changed little from pre- to posttest (difference score: $M = -.003$, $SD = .06$), whereas the average slope for comparison children changed from a steeper to a flatter diurnal pattern, (difference score: $M = .032$, $SD = .07$), $F(3, 94) = 5.90$, $p = .02$, $d = .51$. These cortisol results at posttest for each group are illustrated in Figure 2. In addition to examining slope, we also examined posttest differences between MindUP and BAU children on cortisol secretion at morning arrival, prelunch, and predismissal, controlling for age, gender, and ESL (see Table 4). No significant differences were found between the two groups for cortisol secretion at either prelunch cortisol secretion or predismissal; however, MindUP children had significantly higher cortisol secretion at morning arrival than did BAU children at posttest (see Table 4).

Child self-report. Baseline differences were examined between the MindUP and BAU group children on all child-report prosociality and well-being outcomes namely empathy, perspective-taking, optimism, emotional control, school self-concept, mindfulness, depressive symptoms, and social responsibility using MANCOVAs with intervention status as the independent variable, controlling for age, gender, and ESL. Results for the effect of group across all the child self-report measures at baseline were nonsignificant, $F(7, 88) = 1.32$, *ns*.

To examine potential intervention effects of the MindUP program on children's self-reports, a MANCOVA for the entire set of child self-report measures was conducted, with difference scores (posttest minus pretest) as the dependent measures and intervention status (MindUP vs. BAU) as the independent variable, controlling for age, gender, and ESL. Results showed a significant main effect for group, $F(7, 88) = 2.14$, $p = .04$. Pretest and posttest means, standard deviations, and difference scores for all child self-report measures by group are reported in Table 5.

Follow-up ANCOVAs indicated that, in contrast to children in the BAU group, children in MindUP showed significant improvements from pre- to posttest in empathy, $F(1, 97) = 4.42$, $p = .03$, $d = .42$; perspective-taking, $F(1, 97) = 4.17$, $p = .04$, $d = .40$; optimism, $F(1, 97) = 5.40$, $p = .02$, $d = .48$; emotional control, $F(1, 97) = 8.78$, $p = .004$, $d = .59$; school self-concept, $F(1, 97) = 5.60$, $p = .02$, $d = .50$; and mindfulness, $F(1, 97) = 7.94$, $p = .006$, $d = .55$; and significantly decreased depressive symptoms, $F(1, 97) = 4.14$, $p = .04$, $d = -0.45$ (see Figure 3). The reverse was true for children in the comparison curriculum that focused solely on social responsibility—they reported significant decreases in all of these social–emotional well-being measures (see Figure 3). As hypothesized, no significant difference between

Table 2
Descriptive Statistics (Means and SDs) For Reaction Time Measures On EF Tasks by Condition

	MindUP (*n* = 48)						BAU (*n* = 51)					
	Pretest		Posttest		Adjusted posttest		Pretest		Posttest		Adjusted posttest	
Task	*M*	*SD*	*M*	*SD*	*M*[a]	*SE*	*M*	*SD*	*M*	*SD*	*M*[a]	*SE*
Flanker switch	871.58	245.93	811.22	208.02	844.48	16.58	943.64	246.47	864.75	227.68	879.86	19.30
Flanker vs. reverse flanker	616.64	169.11	577.65	148.28	622.03	13.10	703.70	201.84	625.51	149.72	659.71	12.84
Hearts and flowers congruent vs. incongruent	395.57	100.51	389.63	88.79	398.82	8.48	440.29	124.94	412.18	98.06	419.55	8.43

Note. BAU = business as usual.
[a] Estimated marginal mean.

Table 3
Results of Executive Function Analyses for Reaction Time (RT)

Covariate	Flanker switch trials			Flanker vs. Reverse Flanker			Hearts and Flowers congruent vs. incongruent		
	Estimate	*t*	*p*	Estimate	*t*	*p*	Estimate	*t*	*p*
Group	−48.10	−2.08	.04	−55.66	16.56	.001	−24.89	−2.29	.02
RT pretest	.10	4.70	<.001	.14	10.92	.001	.11	6.63	<.001
Age	−37.98	−1.73	*ns*	−2.33	−0.15	*ns*	2.91	0.28	*ns*
Gender	−35.38	−1.49	*ns*	−24.05	−1.47	*ns*	3.12	0.32	*ns*
ESL	23.65	0.96	*ns*	16.22	0.96	*ns*	11.53	1.06	*ns*
Accuracy	116.26	6.02	<.001	89.54	7.09	<.001	21.91	2.58	.01
Block	—	—	—	−44.04	−7.66	<.001	−52.53	−11.31	<.001
Block × Group	—	—	—	35.97	4.36	<.001	8.31	1.33	*ns*

Note. Dashes in cells indicate that no analyses were conducted for these cells. ESL = English as a second language

the groups was found for self-reported social responsibility, $F(1, 97) = 0.30$, *ns*; both groups improved.

Peer nominations. A MANCOVA conducted to examine baseline differences between MindUP and BAU children on all peer nominations of prosociality yielded a significant multivariate effect for intervention, $F(8, 87) = 10.41$, $p = .001$. To examine baseline differences between MindUP and BAU children, a series of simple ANCOVAs (controlling for age, gender, and ESL) were next conducted. Despite randomization, results revealed significant baseline differences on each of the prosocial dimensions favoring comparison children; shares, $F(1, 94) = 14.11$, $p = .0001$; trustworthiness, $F(1, 94) = 11.29$, $p = .001$; helpful, $F(1, 94) = 14.11$, $p = .001$; takes others' views, $F(1, 94) = 19.28$, $p = .001$; and kind, $F(1, 94) = 13.46$, $p = .001$. Moreover, MindUP children were found to have significantly higher baseline scores on the dimensions of starts fights, $F(1, 94) = 7.17$, $p = .009$, and breaks rules, $F(1, 94) = 11.29$, $p = .001$. No other significant baseline differences were found between groups on our assessment of peer acceptance (i.e., liked by peers) were found, $F(1, 94) = .001$, *ns*.

To assess intervention effects on these measures, a MANCOVA for the entire set of peer nominations of prosociality was next conducted, with difference scores as the dependent measures and intervention as the independent variable, controlling for age, gender, and ESL. Results showed a significant multivariate effect for intervention across all measures, $F(7, 88) = 4.36$, $p = .001$. Given these results, we proceeded with ANCOVA analyses of the difference scores. Pretest and posttest means, standard deviations, and difference scores by group are reported in Table 5.

Difference scores for peer-nominated prosocial and aggressive behaviors and peer liking for children in the MindUP versus children BAU condition are illustrated in Figure 4. Children in the MindUP program, despite initial differences on many of these measures, were more likely to improve from pretest to posttest on almost every dimension of peer-nominated prosocial behavior: sharing, $F(1, 97) = 4.42$, $p = .04$, $d = .42$; trustworthiness, $F(1, 97) = 13.44$, $p = .001$, $d = .76$; helpfulness, $F(1, 97) = 13.05$, $p = .001$, $d = .72$; and taking others' views, $F(1, 97) = 18.90$, $p = .001$, $d = .87$. The findings for peer ratings of kind were not significant but were in the expected direction, $F(1, 97) = 3.14$, $p = .06$, $d = .36$. In addition, children in the MindUP condition showed significant decreases in peer-nominated aggressive behavior from pretest to posttest for breaks rules, $F(1, 97) = 8.07$, $p = .006$, $d = -.55$, and starts fights, $F(1, 97) = 13.95$, $p = .001$, $d = -.71$. Finally, whereas comparison children were liked less by their classmates at posttest in June than they had been at pretest in March as assessed via our peer sociometric procedure (i.e., peer-rated popularity), the reverse was true for children in the MindUP classrooms, $F(1, 97) = 3.93$, $p = .05$, $d = .44$.

Math grades. Analysis of final math grades on a grade metric (9 = A+, 8 = A = 8, . . . 1 = C−) were analyzed via ANCOVA, controlling for age, gender, and ESL. Analysis showed a trend

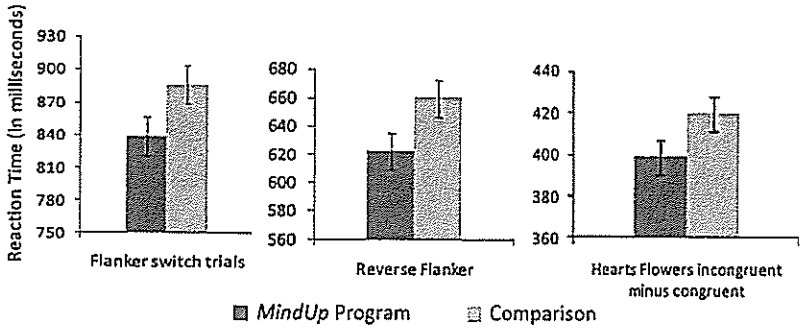


Figure 1. Reaction time (RT) results for executive function tasks. Adjusted means at posttest in RT on EF tasks for MindUP and business as usual (BAU [comparison]) conditions, with covariates for group, RT at pretest, accuracy at pretest, age, gender, English as a second language, block condition, Group × Block interaction, and accuracy of response (correct/incorrect).

Table 4
Summary of Analyses of Pretest and Posttest Cortisol Assessments by Condition

	MindUP (n = 48)		BAU (n = 51)			
Cortisol (g/dl)	*M*	*SD*	*M*	*SD*	*F*	*p*
Pretest						
Morning arrival	0.83	0.20	0.89	0.24	2.18	*ns*
Prelunch	0.62	0.18	0.70	0.16	4.13	*ns*
Afternoon predeparture	0.56	0.19	0.59	0.24	0.22	*ns*
Posttest						
Morning arrival	0.97	0.23	0.76	0.21	11.87	.001
Prelunch	0.76	0.15	0.75	0.16	0.34	*ns*
Afternoon predeparture	0.69	0.16	0.62	0.22	3.04	*ns*

Note. Analyses controlled for age, gender, and English as a second language. BAU = business as usual.

toward higher year-end math grades for children in the MindUP program (M = 6.12, SD = 2.17) than for BAU children (M = 5.25, SD = 2.46, $t(87) = 1.76$, $p = .07$, $d = .38$.

Interpreting Obtained Effects in Context

To provide more information on the value added of bringing a school program that incorporates mindfulness attention training and caring for others to the regular school curriculum, we calculated Cohen's U_3 "improvement" index to reflect the average difference between the percentile rank of the MindUP and BAU groups (Institute of Education Sciences, 2008). We found a 24% gain in peer-nominated positive social behaviors from participation in the MindUP program, a gain of 15% in math achievement, a gain of 20% in self-reported well-being and prosociality, and a reduction of 24% in peer-nominated aggressive behaviors. Put another way, the average student in the BAU condition would demonstrate a 24 percentile increase in positive social behaviors (as rated by peers), a 15 percentile increase in math achievement, a 20 percentile increase in self-reported well-being and prosociality, and a 24 percentile decrease in aggression if he or she had participated in the MindUP program.

Discussion

These preliminary findings suggest that a relatively simple-to-administer SEL curriculum including mindfulness training added onto the regular curriculum for a period of only 4 months can yield promising and noteworthy findings with regard to positive behavioral and cognitive change in children. MindUP children, in contrast to children in a social responsibility program, showed significant improvements in EFs, self-report measures of well-being, and self- and peer-reported prosocial behavior. They also tended to show better math performance (the only subject for which grades were provided by the school) relative to children who received the regular school district social responsibility program. Our findings for cortisol are open to differing interpretations. We discuss each set of findings in turn.

Previous research with adults has shown that cognitive processes associated with PFC, known collectively as EFs, are improved through regular mindfulness attention training (R. J. Davidson et al., 2003; Hölzel et al., 2011; Jha, Krompinger, & Baime, 2007). Consistent with those studies, using behavioral measures of attention, we found that MindUP children in our study outperformed comparison children on the most difficult EF tasks requiring response inhibition, working memory, and cognitive flexibility. There has been considerable theorizing and some data indicating that EFs, and in particular inhibitory control, are especially relevant to the development of emotional regulation during childhood. The results of this study suggest the possibility that the three-times-daily mindfulness practices could have led to the increased inhibitory control, which in turn led to the improved emotional control and decreased aggression that was observed in the MindUP children. It may also be the case that it was not only the mindfulness training that led to increased caring and kindness among students but also the opportunities for promoting optimism and performing acts of kindness for others that are part of the MindUP curriculum. Future research is needed to replicate the find-

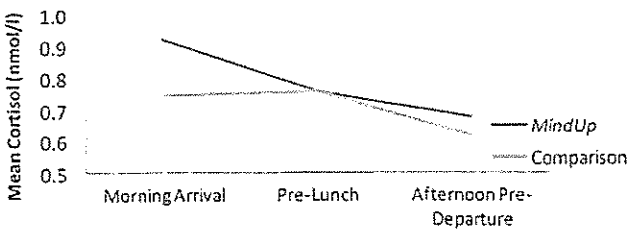


Figure 2. Results for cortisol at posttest. Means for cortisol over the school day at posttest for MindUP and business as usual (BAU [comparison]) children.

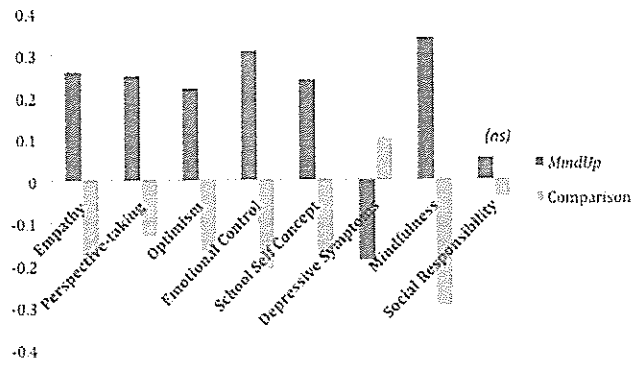


Figure 3. Results for children's self-reported social and emotional competencies.

Table 5
Child Self-Reports of Well-Being and Prosociality and Peer-Nominations of Prosociality and Aggression by Condition

	MindUP (n = 48)						BAU (n = 51)					
	Pretest		Posttest		Difference score		Pretest		Posttest		Difference score	
Measure	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Self-report												
Empathy	3.48	0.7)	3.74	0.68	0.27	1.07	3.86	0.63	3.68	0.81	−0.19	1.05
Perspective-taking	2.99	0.64	3.24	0.67	0.25	0.89	3.24	0.60	3.11	0.67	−0.14	1.02
Optimism	3.66	0.63	3.88	0.64	0.22	0.82	3.85	0.55	3.68	0.02	−0.17	0.81
Emotional control	3.39	0.73	3.70	0.63	0.31	0.85	3.49	0.64	3.30	0.68	−0.21	0.91
School self-concept	3.65	0.66	3.89	0.62	0.23	0.87	3.79	0.58	3.61	0.59	−0.17	0.78
Mindfulness	4.34	0.82	4.68	0.82	0.34	1.22	4.56	0.76	4.26	0.74	−0.30	1.10
Social responsibility	4.01	0.55	4.07	0.59	0.06	0.85	4.23	0.48	4.19	0.55	−0.04	0.69
Depressive symptoms	2.04	0.48	1.85	0.51	−0.19	0.72	1.92	0.51	2.02	0.48	0.10	0.55
Peer behavioral assessment												
Shares	.42	.17	.57	.21	.15	.26	.54	.14	.58	.17	.04	.26
Trustworthy	.30	.15	.35	.15	.05	.19	.40	.16	.29	.18	−.11	.23
Helpful	.34	.14	.44	.18	.10	.22	.49	.14	.42	.20	−.07	.25
Takes others' views	.30	.14	.45	.17	.15	.22	.43	.14	.38	.21	−.05	.24
Kind	.55	.16	.59	.18	.04	.21	.66	.14	.62	.19	−.04	.24
Liked by peers	.32	.16	.38	.17	.06	.22	.32	.16	.28	.16	−.04	.23
Starts fights	.13	.18	.08	.14	−.05	.19	.06	.10	.16	.20	.10	.23
Breaks rules	.14	.19	.13	.21	−.01	.24	.04	.07	.15	.18	.11	.19

Note. BAU = business as usual.

ings on EF and also to identify the "active ingredients" in the curriculum leading to these specific outcomes.

With regard to our findings on cortisol, they were ambiguous and open to differing interpretations. On the one hand, despite no differences in the diurnal rhythm of cortisol between MindUP children and BAU children at pretest (both exhibited a similar decline in cortisol secretion from morning arrival to predismissal), we found that MindUp children's average slope changed little from pre- to posttest, whereas the average slope for comparison children changed from a steeper to a flatter pattern. In healthy people not exposed to chronic stress, cortisol displays a robust diurnal rhythm, with values highest in the morning 30 min after awakening and gradually decreasing throughout the day (Miller, Chen, & Zhou, 2007; Shirtcliff & Essex, 2008; Stetler & Miller, 2008). During this part of the diurnal rhythm, higher (less negative) values indicate a flatter diurnal cortisol slope, whereas lower (more negative) values indicate a steeper diurnal cortisol slope. The change from a healthy diurnal rhythm of cortisol levels (i.e., decline from A.M. to P.M.) to an attenuated diurnal decrease in cortisol from morning to afternoon has been recognized as indicative of neuroendocrine dysregulation (Gunnar, 2000; Gunnar & Vazquez, 2001) and has been found among children experiencing chronic stress (Bevans, Cerbone, & Overstreet, 2008). On the other hand, we found that MindUP children actually showed *higher* morning arrival cortisol secretion at posttest than BAU children (despite no differences at pretest on this measure); this pattern of elevated levels of A.M. cortisol has been found to be associated with increased stress in children (Gunnar, 1992). The fact of the matter is that we know very little about normative cortisol regulation across the day in healthy samples of elementary schoolchildren (for a review, see Quas, 2011). Thus, the nature of program effects on cortisol in this study remains ambiguous. Clearly more research is needed to shed further light on the effects of mindfulness practices on cortisol regulation in late middle childhood and early adolescence.

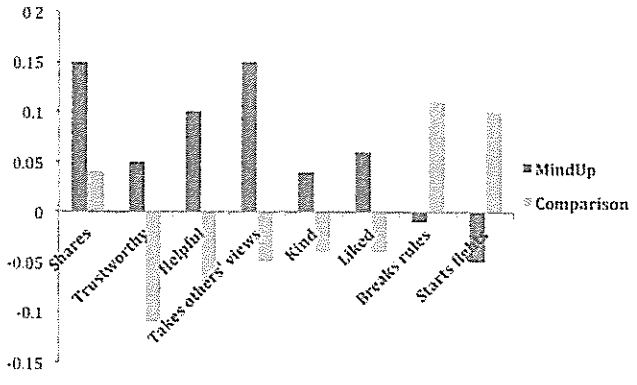


Figure 4. Results for peer nominations of prosocial and aggressive behavior and peer liking. Mean change scores across indices of peer nominations of prosocial and antisocial/aggressive behaviors and peer liking by condition.

Overall, the results of this study are in accord with other research evaluating the effectiveness of well-designed SEL interventions. For instance, in a meta-analysis of 213 school-based, universal SEL programs involving 270,034 students from kindergarten through high school, compared with controls, students in SEL programs demonstrated significantly improved social–emotional skills, attitudes, and behavior *and* academic performance, with an average effect size of .31 (Durlak et al., 2011). Of particular note is that the average effect size of the social, emotional, and behavioral outcomes in the present study was .55. Hence, the present study adds to the growing literature on SEL programs and provides initial evidence that mindfulness practices can provide an added value to an SEL program.

One question that arises with regard to teachers implementing the MindUP program is what changes might have occurred in them as a result to implementing the program. That is, could the MindUP program have led to changes in the teachers themselves? Anecdotally, the teachers reported that they also participated in the three-times-daily mindful breathing practices with their students. Could this have led to differences in their own stress regulation in the classroom? Recent evidence indicates that efforts to improve teachers' knowledge about SEL alone are not sufficient for successful SEL implementation. Indeed, teachers' own SEL competence and well-being appears to play a crucial role in influencing the infusion of SEL into classrooms and schools (Jones, Bouffard, & Weissbourd, 2013). Clearly, future research is needed that examines changes that occur in *teachers* as a result of implementing an SEL program that integrates mindfulness practices.

Study Limitations

There were various limitations to this study. First, analyses were conducted at the individual child level even though randomization to condition was done at the classroom level. This limits the causal inferences to be drawn from this initial study of the program. Unfortunately, the small number of classrooms did not provide sufficient statistical power to use MLM. The clustering of children within classrooms results in the nonindependence of subjects, which could bias the statistical tests used to identify intervention effects. This is a major challenge to evaluations of universal, school-based interventions when insufficient resources exist to recruit large numbers of classrooms or schools (Stoolmiller, Eddy, & Reid, 2000). Nonetheless, as noted by Slavin (2008), although analyzing data at the child level when randomization was done at the classroom level is discouraged by methodologists, because the findings can exaggerate statistical significance, "their effect sizes are unbiased . . . and therefore are of value" (p. 9). The effect sizes in this study do suggest the promise of this program in producing change in child attention and well-being.

Second, despite randomization to treatment, significant differences were found between MindUP and comparison children at baseline on one of the child self-report measures (empathy) and most of the peer behavioral assessment indices. It should be noted that finding baseline differences between a treatment and control group is a common occurrence in studies like ours in which there is a small-to-moderate sample size (Shadish, Cook, & Campbell, 2002). Nonetheless, the success of our random assignment procedure, as evidenced by the lack of any significant demographic differences between MindUP and comparison children, gives us confidence that our results represent an internally valid test of intervention effects on child outcomes. Moreover, because the pattern of change for almost every one of our dimensions of peer behavioral assessments was one in which MindUP students significantly and positively improved and control children decreased or became worse, this provides further evidence that the MindUP program was successful in improving children's behaviors as rated by their peers. Indeed, as noted by Shadish et al. (2002), this crossover pattern (i.e., one in which the trend lines cross over and the means are reliably different in one direction at pretest and in the opposite direction at posttest for the treatment and control groups) represents a pattern that is particularly amenable for asserting causal claims regarding treatment effects, because the plausibility of other alternative interpretations for the findings (e.g., ceiling effects, selection-maturation effects) is significantly reduced.

Third, with regard to our teacher and peer assessments, raters were not blind to treatment condition. Although peers as participant observers can provide important sources of information about their classmates' behaviors both inside and outside of the classroom, our peer behavioral assessment measure of prosocial and aggressive/antisocial behaviors may have been influenced by peers' knowledge about the experimental condition. We speculate here that peers' ratings of classmates' behaviors would be less likely than teachers' to be influenced by knowledge of the intervention status, given that it is unlikely that children would be able to generate specific a priori hypotheses of the study. Nonetheless, we have no data to support such a claim, and future investigations of the MindUP program would benefit from collecting data from observers blind to intervention status to allow for a more objective measure of children's behaviors. Similar concerns arise with respect to using teacher report measures of students when teachers are not blind to the condition to which a classroom has been assigned in a field experiment.

Conclusions

This small study is among the few that have examined the effectiveness of an SEL program for children using an array of cognitive–behavioral, neurophysiological, and psychological indicators for multiple sources. The findings demonstrate that giving children mindfulness attention training in combination with opportunities to practice optimism, gratitude, perspective-taking, and kindness to others can not only improve cognitive skills but also lead to significant increases in social and emotional competence and well-being in the real-world setting of regular elementary classrooms. Whether or not a mindfulness-training component plays a direct or indirect role in fostering the development of both cognitive control skills and social–emotional competence and well-being, this study provides promising evidence that the inclusion of mindfulness practices in a classroom-based SEL program may represent a value-added component to the regular school curriculum that can result in multiple benefits.

What are the implications of this study for future research? We would argue that rigorously designed experimental studies that are grounded in strong developmental theory; that include multimethod, multiinformant approaches; and that follow up children after a program has ended are clearly warranted to advance the field. Similarly, these studies should be conducted by teams of researchers from multiple disciplines (e.g., developmental neuroscience, contemplative science, health, education, sociology) to shed light on the effects of these interventions across multiple levels of functioning—biological, cognitive, and contextual. Such research will add greatly to the field and help advance the science and practice of mindfulness-based SEL preventive interventions that will help all children thrive and flourish.

References

Aguilar-Pardo, D., Martínez-Arias, R., & Colmenares, F. (2013). The role of inhibition in young children's altruistic behaviour. *Cognitive Processing, 14*, 301–307. http://dx.doi.org/10.1007/s10339-013-0552-6

Battin-Pearson, S., Newcomb, M. D., Abbott, R. D., Hill, K. G., Catalano, R. F., & Hawkins, J. D. (2000). Predictors of early high school dropout: A test of five theories. *Journal of Educational Psychology, 92,* 568–582. http://dx.doi.org/10.1037/0022-0663.92.3.568

Best, J. R., & Miller, P. H. (2010). A developmental perspective on executive function. *Child Development, 81,* 1641–1660. http://dx.doi.org/10.1111/j.1467-8624.2010.01499.x

Bevans, K., Cerbone, A., & Overstreet, S. (2008). Relations between recurrent trauma exposure and recent life stress and salivary cortisol among children. *Development and Psychopathology, 20,* 257–272. http://dx.doi.org/10.1017/S0954579408000126

Biegel, G. M., Brown, K. W., Shapiro, S. L., & Schubert, C. M. (2009). Mindfulness-based stress reduction for the treatment of adolescent psychiatric outpatients: A randomized clinical trial. *Journal of Consulting and Clinical Psychology, 77,* 855–866. http://dx.doi.org/10.1037/a0016241

Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology, 84,* 822–848. http://dx.doi.org/10.1037/0022-3514.84.4.822

Cohen, J. (1988). *Statistical power analysis* (2nd ed.). Hillsdale, NJ: Erlbaum.

Collaborative for Academic, Social, and Emotional Learning. (2013). *2013 CASEL guide: Effective social and emotional learning programs—Preschool and elementary school edition.* Chicago: Author.

Collins, W. A. (1984). *Development during middle childhood: The years from six to twelve.* Washington, DC: National Academy Press.

Committee on Defining Deeper Learning and 21st Century Skills. (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st Century* (J. W. Pellegrino, & M. L. Hilton, Eds.). Washington, DC: National Academies Press.

Committee on the Prevention of Mental Disorders and Substance Abuse Among Children, Youth, and Young Adults: Research Advances and Promising Interventions. (2009). *Preventing mental, emotional, and behavioral disorders among young people: Progress and possibilities* (M. E. O'Connell, T. Boat, & K. E. Warner, Eds.). Washington, DC: National Academies Press.

Craven, R. G., Marsh, H. W., Debus, R. L., & Jayasinghe, U. (2001). Diffusion effects: Control group contamination threats to the validity of teacher-administered interventions. *Journal of Educational Psychology, 93,* 639–645. http://dx.doi.org/10.1037/0022-0663.93.3.639

Davidson, M. C., Amso, D., Anderson, L. C., & Diamond, A. (2006). Development of cognitive control and executive functions from 4 to 13 years: Evidence from manipulations of memory, inhibition, and task switching. *Neuropsychologia, 44,* 2037–2078. http://dx.doi.org/10.1016/j.neuropsychologia.2006.02.006

Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., . . . Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine, 65,* 564–570. http://dx.doi.org/10.1097/01.PSY.0000077505.67574.E3

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44,* 113–126. http://dx.doi.org/10.1037/0022-3514.44.1.113

Diamond, A. (2012). Activities and programs that improve children's executive functions. *Current Directions in Psychological Science, 21,* 335–341. http://dx.doi.org/10.1177/0963721412453722

Diamond, A. (2009). All or none hypothesis: A global default mode that characterizes the brain and mind. *Developmental Psychology, 45,* 130–138. http://dx.doi.org/10.1037/a0014025

Diamond, A., Barnett, W. S., Thomas, J., & Munro, S. (2007, November 30). Preschool program improves cognitive control. *Science, 318,* 1387–1388. http://dx.doi.org/10.1126/science.1151148

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development, 82,* 405–432. http://dx.doi.org/10.1111/j.1467-8624.2010.01564.x

Eccles, J. S., & Roeser, R. W. (2009). Schools, academic motivation, and stage–environment fit. In R. M. Lerner & L. Steinberg (Eds.). *Handbook of adolescent psychology: Vol. 1. Individual bases of adolescent development* (3rd ed., pp. 404–434). Hoboken, NJ: Wiley.

Eisenberg, N., Fabes, R. A., & Spinrad, T. (2006). Prosocial development. In W. Damon & R. M. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp. 646–718). Hoboken, NJ: Wiley.

Giedd, J. N. (2008). The teen brain: Insights from neuroimaging. *Journal of Adolescent Health, 42,* 335–343. http://dx.doi.org/10.1016/j.jadohealth.2008.01.007

Greenberg, M. T., & Harris, A. R. (2012). Nurturing mindfulness in children and youth: Current state of research. *Child Development Perspectives, 6,* 161–166. http://dx.doi.org/10.1111/j.1750-8606.2011.00215.x

Greenberg, M. T., Weissberg, R. P., O'Brien, M. U., Zins, J. E., Fredericks, L., Resnik, H., & Elias, M. J. (2003). Enhancing school-based prevention and youth development through coordinated social, emotional, and academic learning. *American Psychologist, 58,* 466–474. http://dx.doi.org/10.1037/0003-066X.58.6-7.466

Gunnar, M. R. (1992). Reactivity of the hypothalamic–pituitary–adrenocortical system to stressors in normal infants and children. *Pediatrics, 90,* 491–497.

Gunnar, M. (2000). Early adversity and the development of stress reactivity and regulation. In C. A. Nelson (Ed.), *The effects of adversity on neurobehavioral development: The Minnesota Symposia on Child Psychology* (pp. 163–200). Mahwah, NJ: Erlbaum.

Gunnar, M. R., & Vazquez, D. M. (2001). Low cortisol and a flattening of expected daytime rhythm: Potential indices of risk in human development. *Development and Psychopathology, 13,* 515–538. http://dx.doi.org/10.1017/S0954579401003066

Harter, S. (2006). The self. In W. Damon & R. M. Lerner (Series Eds.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp. 505–570). Hoboken, NJ: Wiley.

Hawn Foundation. (2008). *Mindfulness education.* Miami Beach, FL: Author.

Hölzel, B. K., Lazar, S. W., Gard, T., Schuman-Olivier, Z., Vago, D. R., & Ott, U. (2011). How does mindful meditation work? Proposing mechanisms of action from a conceptual and neural perspective. *Perspectives on Psychological Science, 6,* 537–559. http://dx.doi.org/10.1177/1745691611419671

Institute of Education Sciences. (2008). *What works clearinghouse: Procedures and standards workbook* (Version 2.0). Retrieved from http://ies.ed.gov/ncee/wwc_procedures_v2_standards_handbook.pdf

Jha, A. P., Krompinger, J., & Baime, M. J. (2007). Mindfulness training modifies subsystems of attention. *Cognitive, Affective & Behavioral Neuroscience, 7,* 109–119. http://dx.doi.org/10.3758/CABN.7.2.109

Jones, S. M., & Bouffard, S. M. (2012). Social and emotional learning in schools: From programs to strategies. *Society for Research on Child Development Social Policy Report, 26 (4).* Retrieved from http://eric.ed.gov/?id=ED540203

Jones, S. M., Bouffard, S. M., & Weissbourd, R. (2013). Educators' social and emotional skills vital to learning. *Phi Delta Kappan, 94,* 62–65. http://dx.doi.org/10.1177/003172171309400815

Kabat-Zinn, J. (1994). *Mindfulness meditation for everyday life.* New York: Hyperion.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10,* 144–156. http://dx.doi.org/10.1093/clipsy.bpg016

Kusché, C. A., Greenberg, M. T., & Beilke, R. (1988). *Seattle Personality Questionnaire for Young School-aged Children.* Unpublished personality questionnaire, University of Washington, Department of Psychology, Seattle, WA.

Langer, E. J., & Moldoveanu, M. (2000). The construct of mindfulness. *Journal of Social Issues, 56,* 1–9. http://dx.doi.org/10.1111/0022-4537.00148

Lawlor, M. S., Schonert-Reichl, K. A., Gadermann, A. M., & Zumbo, B. (2014). A validation study of the Mindful Attention Awareness Scale adapted for children. *Mindfulness, 5,* 730–741. http://dx.doi.org/10.1007/s12671-013-0228-4

Luthar, S. S., & Brown, P. J. (2007). Maximizing resilience through diverse levels of inquiry: Prevailing paradigms, possibilities, and priorities for the future. *Development and Psychopathology, 19,* 931–955. http://dx.doi.org/10.1017/S0954579407000454

Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology, 9,* 111–131. http://dx.doi.org/10.1037/1089-2680.9.2.111

Marcus, M. T., Fine, M., Moeller, G., Khan, M. M., Pitts, K., Swank, P. R., & Liehr, P. (2003). Change in stress levels following mindfulness-based stress reduction in a therapeutic community. *Addictive Disorders & Their Treatment, 2,* 63–68. http://journals.lww.com/addictiondisorders/Abstract/2003/02030/. http://dx.doi.org/10.1097/00132576-200302030-00001

Marsh, H. W., Barnes, J., Cairns, L., & Tidman, M. (1984). Self-description questionnaire: Age and sex effects in the structure and level of self-concept for preadolescent children. *Journal of Educational Psychology, 76,* 940–956. http://dx.doi.org/10.1037/0022-0663.76.5.940

Miller, G. E., Chen, E., & Zhou, E. S. (2007). If it goes up, must it come down? Chronic stress and the hypothalamic–pituitary–adrenocortical axis in humans. *Psychological Bulletin, 133,* 25–45. http://dx.doi.org/10.1037/0033-2909.133.1.25

Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., . . . Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences of the United States of America, 108,* 2693–2698. http://dx.doi.org/10.1073/pnas.1010076108

Murray-Close, D., Han, G., Cicchetti, D., Crick, N. R., & Rogosch, F. A. (2008). Neuroendocrine regulation and physical and relational aggression: The moderating roles of child maltreatment and gender. *Developmental Psychology, 44,* 1160–1176. http://dx.doi.org/10.1037/a0012564

Noam, G. G., & Goldstein, L. S. (1998). *The Resiliency Inventory.* Unpublished protocol.

Noddings, N. (1992). *The challenge to care in schools: An alternative approach to education.* New York: Teachers College Press.

Nucci, L., & Turiel, E. (2009). Capturing the complexity of moral development and education. *Mind, Brain, and Education, 3,* 151–159. http://dx.doi.org/10.1111/j.1751-228X.2009.01065.x

Oberle, E., Schonert-Reichl, K. A., & Thomson, K. C. (2010). Understanding the link between social and emotional well-being and peer relations in early adolescence: Gender-specific predictors of peer acceptance. *Journal of Youth and Adolescence, 39,* 1330–1342. http://dx.doi.org/10.1007/s10964-009-9486-9

Parkhurst, J. T., & Asher, S. R. (1992). Peer rejection in middle school: Subgroup differences in behavior, loneliness, and interpersonal concerns. *Developmental Psychology, 28,* 231–241. http://dx.doi.org/10.1037/0012-1649.28.2.231

Quas, J. A. (2011). Measuring physiological stress responses in children: Lessons from a novice. *Journal of Cognition and Development, 12,* 261–274. http://dx.doi.org/10.1080/15248372.2011.590785

Roeser, R. W. (in press). The emergence of mindfulness-based interventions in educational settings. In S. Karabenick & T. Urdan (Eds.), *Advances in motivation and achievement, Vol. 18, Motivational interventions.* Bingley, England: Emerald.

Roeser, R. W., & Eccles, J. S. (2014). Schooling and the mental health of children and adolescents in the United States. In M. Lewis & K. Rudolph (Eds.), *Handbook of developmental psychopathology* (3rd ed., pp. 163–184). New York: Springer. http://dx.doi.org/10.1007/978-1-4614-9608-3_9

Roeser, R. W., & Pinela, C. (2014). Mindfulness and compassion training in adolescence: A developmental contemplative science perspective. *New Directions for Youth Development, 2014,* 9–30. http://dx.doi.org/10.1002/yd.20094

Roeser, R. W., & Zelazo, P. D. (2012). Contemplative science, education and child development: Introduction to the special section. *Child Development Perspectives, 6,* 143–145. http://dx.doi.org/10.1111/j.1750-8606.2012.00242.x

Schonert-Reichl, K. A., Smith, V., Zaidman-Zait, A., & Hertzman, C. (2012). Promoting children's prosocial behaviors in school: Impact of the "Roots of Empathy" program on the social and emotional competence of school-aged children. *School Mental Health, 4,* 1–21. http://dx.doi.org/10.1007/s12310-011-9064-7

Schonert-Reichl, K. A., & Weissberg, R. P. (2014). Social and emotional learning during childhood. In T. P. Gullotta & M. Bloom (Eds.), *Encyclopedia of primary prevention and health promotion* (2nd ed.), pp. 936–949. New York: Springer.

Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference.* Boston: Houghton Mifflin.

Shirtcliff, E. A., & Essex, M. J. (2008). Concurrent and longitudinal associations of basal and diurnal cortisol with mental health symptoms in early adolescence. *Developmental Psychobiology, 50,* 690–703. http://dx.doi.org/10.1002/dev.20336

Shonkoff, J. P., Boyce, W. T., & McEwen, B. S. (2009). Neuroscience, molecular biology, and the childhood roots of health disparities: Building a new framework for health promotion and disease prevention. *JAMA, 301,* 2252–2259. http://dx.doi.org/10.1001/jama.2009.754

Slavin, R. E. (2008). Perspectives on evidence-based research in education—What works? Issues in synthesizing educational program evaluations. *Educational Researcher, 37,* 5–14. http://dx.doi.org/10.3102/0013189X08314117

Song, M. (2003). *Two studies on the resiliency inventory (RI): Toward the goal of creating a culturally sensitive measure of adolescent resilience.* Unpublished doctoral dissertation, Harvard University.

Statistics Canada. (2006). *Census of population, semi-custom area profile and taxfiler, 2004.* Ottawa, Ontario, Canada: Author.

Staub, E. (1988). The evolution of caring and nonaggressive persons and societies. *Journal of Social Issues, 44,* 81–100. http://dx.doi.org/10.1111/j.1540-4560.1988.tb02064.x

Stetler, C. A., & Miller, G. E. (2008). Social integration of daily activities and cortisol secretion: A laboratory based manipulation. *Journal of Behavioral Medicine, 31,* 249–257. http://dx.doi.org/10.1007/s10865-007-9143-2

Stoolmiller, M., Eddy, J. M., & Reid, J. B. (2000). Detecting and describing preventive intervention effects in a universal school-based randomized trial targeting delinquent and violent behavior. *Journal of Consulting and Clinical Psychology, 68,* 296–306. http://dx.doi.org/10.1037/0022-006X.68.2.296

Swearer, S. M., Espelage, D. L., Vaillancourt, T., & Hymel, S. (2010). What can be done about school bullying? Linking research to educational practice. *Educational Researcher, 39,* 38–47. http://dx.doi.org/10.3102/0013189X09357622

Tabachnick, B., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston: Allyn & Bacon.

Tang, Y. Y., Ma, Y., Wang, J., Fan, Y., Feng, S., Lu, Q., . . . Posner, M. I. (2007). Short-term meditation training improves attention and self-regulation. *Proceedings of the National Academy of Sciences of the United States of America, 104,* 17152–17156. http://dx.doi.org/10.1073/pnas.0707678104

Thomson, K., Schonert-Reichl, K. A., & Oberle, E. (2014). Optimism in early adolescence: Relations to individual characteristics and ecological assets in families, schools, and neighborhoods. *Journal of Happiness Studies.* Advance online publication. http://dx.doi.org/10.1007/s10902-014-9539-y

van de Weijer-Bergsma, E., Formsma, A. R., de Bruin, E. I., & Bögels, S. M. (2012). The effectiveness of mindfulness training on behavioral problems and attentional functioning in adolescents with ADHD. *Journal of Child and Family Studies, 21,* 775–787. http://dx.doi.org/10.1007/s10826-011-9531-7

Weissberg, R. P., Caplan, M. Z., & Sivo, P. J. (1989). A new conceptual framework for establishing school-based social competence promotion programs. In L. A. Bond & B. E. Compas (Eds.), *Primary prevention and promotion in the schools* (pp. 255–296). Newbury Park, CA: Sage.

Wentzel, K. R. (1993). Motivation and achievement in early adolescence: The role of multiple classroom goals. *Journal of Early Adolescence, 13,* 4–20. http://dx.doi.org/10.1177/0272431693013001001

Wentzel, K. R., Barry, C. M., & Caldwell, K. A. (2004). Friendships in middle school: Influences on motivation and school adjustment. *Journal of Educational Psychology, 96,* 195–203. http://dx.doi.org/10.1037/0022-0663.96.2.195

Wright, A., & Diamond, A. (2014). An effect of inhibitory load in children while keeping working memory load constant. *Frontiers in Psychology.* Advance online publication. http://dx.doi.org/10.3389/fpsyg.2014.00213

Zelazo, P. D., & Carlson, S. M. (2012). Hot and cool executive function in childhood and adolescence: Development and plasticity. *Child Development Perspectives, 6,* 354–360. http://dx.doi.org/10.1111/j.1750-8606.2012.00246.x

Zelazo, P. D., & Lyons, K. E. (2012). The potential benefits of mindfulness training in early childhood: A developmental social cognitive neuroscience perspective. *Child Development Perspectives, 6,* 154–160. http://dx.doi.org/10.1111/j.1750-8606.2012.00241.x

Zoogman, S., Goldberg, S. B., Hoyt, W. T., & Miller, L. (2014). Mindfulness interventions with youth: A meta-analysis. *Mindfulness.* Advance online publication. http://dx.doi.org/10.1007/s12671-013-0260-4

Zumbo, B. D. (1999). The simple difference score as an inherently poor measure of change: Some reality, much mythology. In B. Thompson (Ed.), *Advances in social science methodology* (Vol. 5, pp. 269–304). Greenwich, CT: JAI Press.

Received December 30, 2013
Revision received October 20, 2014
Accepted October 22, 2014 ■

ORIGINAL RESEARCH

Primary Care, Behavioral Health, Provider Colocation, and Rurality

Benjamin F. Miller, PsyD, Stephen Petterson, PhD, Shandra M. Brown Levey, PhD, Jessica C. Payne-Murphy, MA, Miranda Moore, PhD, and Andrew Bazemore, MD, MPH

Purpose: **The purpose of this study was to characterize the proximity of primary care and behavioral health service delivery sites in the United States and factors influencing their colocation.**

Methods: **We geocoded the practice addresses of primary care and behavioral health providers found in the Centers for Medicare & Medicaid Services' National Plan and Provider Enumeration System Downloadable File to report where colocation is occurring throughout the country.**

Results: **The extent to which primary care physicians are colocated with behavioral health providers is strongly associated with rurality. Specifically, 40.2% of primary care physicians in urban areas are colocated with behavioral health providers compared with 22.8% in isolated rural areas and 26.5% in frontier areas. However, when controlling for number of primary care physicians at a location, the odds of colocation actually are greater for physicians in a frontier area than those in urban areas (odds ratio, 1.289; $P < .01$).**

Conclusions: **Our findings offer new insights into the overlap of the behavioral health and primary care workforce, where opportunities for integration may be limited because of practice size and the proximity of providers, and where new possibilities for integration exist. (J Am Board Fam Med 2014; 27:367–374.)**

Keywords: **Health Policy, Integrated Delivery Systems, Mental Health, Primary Health Care**

Current fragmentation in health care leads to increased cost and is associated with decreased health outcomes and overall quality of care.[1–3] Central to this problem is the perpetuation of the false dichotomy that has separated mental health from physical health systems.[4] Many have written extensively about the need for increased and improved integration of primary care and behavioral health, which includes mental health and substance use services.[4–7] Emerging research indicates that the integration of behavioral health into primary care improves health care access, minimizes stigma associated with seeking mental health services, increases overall health outcomes, and lowers health care costs.[6,8]

To date, there have been limited attempts to assess where integration is occurring throughout the country.[9] The challenge for this assessment is the vast differences in practices' classification schemas for integration and the lack of a national database that clearly encapsulates the practices that are integrating primary care and behavioral health on site.[10,11]

This article uses a novel approach to identify where behavioral health and primary care service delivery currently intersect and diverge, focusing on their proximity or colocation to each other. While colocation is by no means the equivalent of integration, it is often a part of the definition.[10] Using practice addresses from a listing of most health care providers in the United States, we examined the extent to which primary care physicians (PCPs) and

This article was externally peer reviewed.

Submitted 20 September 2013; revised 5 February 2014; accepted 10 February 2014.

From the Department of Family Medicine, University of Colorado Denver School of Medicine, Aurora (BFM, SMBL, JCP-M); and The Robert Graham Center, Washington, DC (SP, MM, AB).

Funding: none.

Conflict of interest: none declared.

Corresponding author: Benjamin F. Miller, PsyD, University of Colorado Denver School of Medicine Department of Family Medicine, Mail Stop F49, Academic Office 1, 12631 East 17th Avenue, Aurora, CO 80045 (E-mail: benjamin.miller@ucdenver.edu).

behavioral health providers share the same space, although not necessarily the same practice.

A somewhat self-evident issue is that colocation is more common in larger practices. What is not so obvious is the extent to which PCPs in smaller practices share space with behavioral health providers. Thus, we examine how the concentration of primary care providers in a particular location is related to colocation. A shared location (also known as colocation) also means something different in rural than urban areas. In particular, sharing the same address may be meaningful in an urban area, but colocation of rural PCPs and behavioral health providers in the same small town may matter the most. Sharing the same space, however defined, is certainly different from integration. Still, colocation is of intrinsic interest because it offers the *potential* of collaboration and the improvement of health care delivery for Americans.

Using US national workforce data, our analysis addresses 3 related issues. The first is a straightforward examination of the association between rurality and the number of PCPs that are colocated (hereafter "PCPs at location"), regardless of whether they are in the same practice. The second issue is the relationship between PCPs at location and colocation between primary care physicians and behavioral health providers, using both a narrow and broad measure of colocation. The final issue is less obvious: the extent to which the association between rurality and PCPs at location explains differences across levels of rurality in the colocation of PCPs and behavioral health providers.

Methods

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) mandated that the National Provider Identifier (NPI) be required for Medicare services and has been widely adopted by other payers.[12] In particular, in 2007, all entities covered by the Health Insurance Portability and Accountability Act, such as providers completing electronic transactions, health care clearinghouses, and large health plans, were required to use only the NPI to identify covered health care providers. Thus, nearly all health care providers who bill third parties for their services, including physicians and behavioral health providers, have obtained an NPI. Providers who are excluded include those who (1) only bill their patients directly or (2) occupy a salaried position and payment for their services is only from their employer. Information gathered from health care providers with an NPI is publicly available from the Centers for Medicare & Medicaid Services in the National Plan and Provider Enumeration System (NPPES) Downloadable File. The data includes 2 pieces of provider information required for our colocation analysis: practice address and provider specialty. We used data from August 2010; this earlier date was chosen to minimize the inclusion of an increasing number of retired or otherwise inactive providers listed in the NPPES.

We were able to identify active physicians with more precision by matching the NPPES data with the 2010 American Medical Association's (AMA) Physician Masterfile. Using common identifiers in both data sets (including name, address, and unique physician identification number), we were able to match approximately 95% of the physicians in the 2010 NPPES data with those in the 2010 AMA Physician Masterfile. Given this match, we restricted our analysis to physicians classified in the Masterfile as providing direct patient care, thus excluding those who are retired residents, as well as those who mainly teach or hold administrative positions.

By geocoding the practice addresses in the NPPES data we were able to count the number of behavioral health providers and PCPs in a particular location. PCPs are those specializing in family medicine, general internal medicine, general pediatrics, geriatrics, and general practice. Behavioral health providers include psychiatrists, psychologists, social workers, marriage and family therapists, mental health counselors, and substance abuse counselors.

Using longitude and latitude coordinates, we used different levels of precision to identify a shared space. Using 5 digits after the decimal place (eg, 43.23983, 23.56778), there is approximately a 1-m buffer around each point; this level of precision almost always means that persons at that location share the same street address. This is different from being in the same practice. It is quite common, especially in larger urban centers, that multiple medical practices share the same street address. At the same time, it is not uncommon for physicians and behavioral health providers in different practices to collaborate in the care of a pa-

tient; such collaboration is arguably facilitated by proximity.

Using 4 digits (eg, 43.2398, 23.5678) there is approximately a 10-m buffer that may include neighboring buildings; using 3 digits, the buffer is approximately 100 m ("down the road"); and using 2 digits, the buffer is 1 km (the "other side of a small town"). For each of these levels of precision we obtained a count of the behavioral health providers and PCPs and calculated the percentage of these physicians who are colocated with these providers. Our preliminary findings indicated little difference in estimates of colocation using 5, 4, or 3 digits; thus we restricted the analysis to results using the more precise (5-digit) measure and the broader 2-digit measure.

For each PCP, we obtained a count of the number of PCPs sharing the same 5-digit latitude and longitude, which is effectively the same street address (but not the same suite, office, floor, and any other ways to differentiate among multiple occupants that share the same street address.) We use "PCPs at location" as a shorthand for this measure, with understanding that multiple practices may be located at a particular site and that a practice may have providers located at multiple sites. For ease of presentation, we classified site size into 3 categories: just 1 PCP, 2 to 10 physicians, and >10 physicians.

To identify different levels of rurality, we use a measure based on the Rural-Urban Commuting Area (RUCA) codes. This is a Census tract–based classification scheme that uses the standard Bureau of Census Urbanized Area and Urban Cluster definitions in combination with work commuting information to characterize all the nation's Census tracts regarding their rural and urban status and relationships. There is also a ZIP code RUCA approximation that is used in this analysis by using the ZIP code of providers' practice location. Rural researchers have developed a RUCA-based measure that classifies all ZIP code areas as urban, large rural, small rural, isolated rural, or frontier.[13] Among several alternatives, we use the following definition of frontier areas based on travel time: "all ZIPs that have RUCA 10 codes that are more than 60 minutes or greater road travel to the closest edge of an Urbanized Area and are more than 30 minutes or greater road travel to the closest edge of a large Urbanized Cluster of 10,000 population or greater."[13]

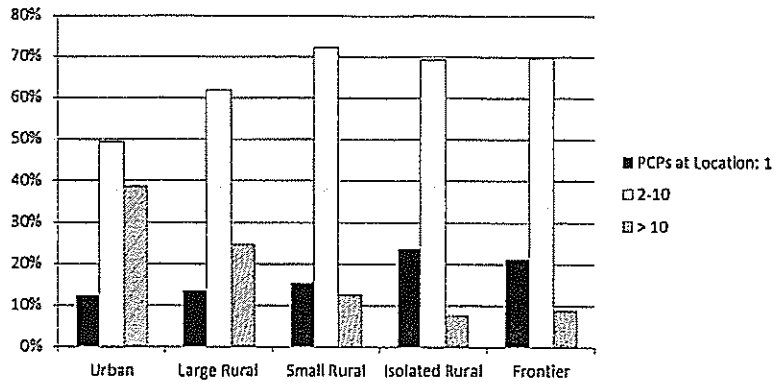
We used simple tabulations and χ^2 statistics to examine the associations between (1) PCPs at location and rurality, (2) PCPs at location and colocation, and (3) rurality and colocation. To examine the extent to which rural-urban differences are attributable to smaller numbers of PCPs at location in rural areas, we estimated multiple logistic regression models. Using both a precise (5-digit) and broad (2-digit) measure of colocation, we examined nested models. These include levels of rurality (urban, large rural, small rural, isolated rural, and frontier), PCPs at location, as well as an interaction term between PCPs at location and rurality. We compared different ways to specify PCPs at location and decided to use the natural log of size to capture the nonlinearity in the relation between this number and colocation (see Results). All statistical analyses were completed using Stata 13.1 (StataCorp LP, College Station, TX). Statistical significance is defined as $P < .01$.

Results

The first step of this analysis was to examine the relationship between level of rurality and the number of PCPs located at a particular location (PCPs at location). Overall, in the 2010 NPPES, we identified approximately 211,000 primary care physicians in direct patient care, a figure very close to other estimates of the size of the primary care workforce.[14–16] Of these PCPs, 175,197 practice in urban areas, 18,113 in large rural areas, 9,837 in small rural areas, 2,560 in isolated rural areas, and 2,248 in frontier areas. As expected, there is a strong association between numbers of PCPs at location and rurality (Figure 1). The percentage of all locations with just 1 PCP is 12% in urban areas and doubles to 24% in isolated rural areas and 21% in frontier areas. The percentage of locations with more than 10 PCPs is 39% in urban areas but just 9% in frontier areas.

The extent to which PCPs are colocated with behavioral health providers is strongly associated with rurality using either a point (with 5 digits after the decimal) or an area with a 1.1-km buffer (2 digits) (Figure 2). With the point estimate, we found that 40.2% of PCPs in urban areas are colocated with behavioral health providers compared with 22.8% in isolated rural areas and 26.5% in frontier areas. Using the larger area to define colocation, more than three fourths (77.8%) of urban PCPs are near a behavioral

Figure 1. Distribution of primary care physicians (PCPs) at location by level of rurality.



health provider compared with a little more than a third (37.3%) in frontier areas.

We turn to the final analysis that examines differences in colocation across both rurality and numbers of PCPs at location. While there is a substantial difference in colocation across levels of rurality, we examined the extent to which these differences are explained by fewer PCPs at a given location. The nested logistic regression results in Table 1 summarize our analysis.

Our main finding is that after controlling for the number of PCPs at location, much of the observed difference in colocation across levels of rurality disappears. In particular, in the second model, there is not a significant difference in the likelihood of colocation in an urban area and an isolated rural area (odds ratio [OR], 1.063; $P > .05$). Surprisingly, after controlling for size, the odds of colocation are actually greater for physicians in a frontier area than their counterparts in urban areas (OR, 1.289; $P < .01$).

The final model in Table 1 includes interaction terms between the number of PCPs at location and level of rurality. These results indicate a size effect slightly lower in large rural areas compared with urban areas (OR, 0.907; 95% confidence interval, 0.871–0.944), but the reverse is true for PCPs in the more rural areas, such as isolated rural settings (OR, 1.214; 95% confidence interval, 1.066–1.381). This relationship is displayed in Figure 3, which shows how the likelihood of colocation varies by site size for physicians in urban areas, large rural areas, and more rural locations (combining small rural, isolated rural, and frontier). In isolated and frontier rural areas, physicians in locations with few physicians are less likely to be colocated than urban PCPs. However, the likelihood of colocation rises sharply with size, reaching 100% for sites with 25 to 30 physicians. By contrast, the likelihood of colocation increases more gradually and nears 100% only in locations with more than 100 to 110 PCPs.

Limitations

The data we use is silent about integration and collaboration among PCPs and behavioral health

Figure 2. Percentage of primary care physicians collocated with behavioral health providers by level of rurality and match precision.

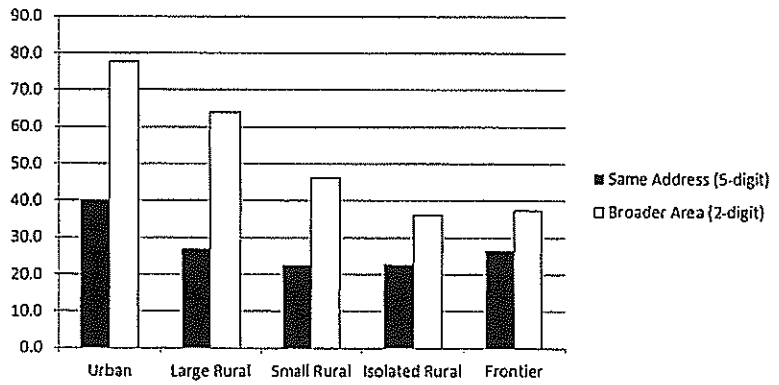


Table 1. Summary of Logistic Regression Analysis Examining Joint Impact of Size and Rurality on Colocation of Primary Care Physicians with Behavioral Health Providers

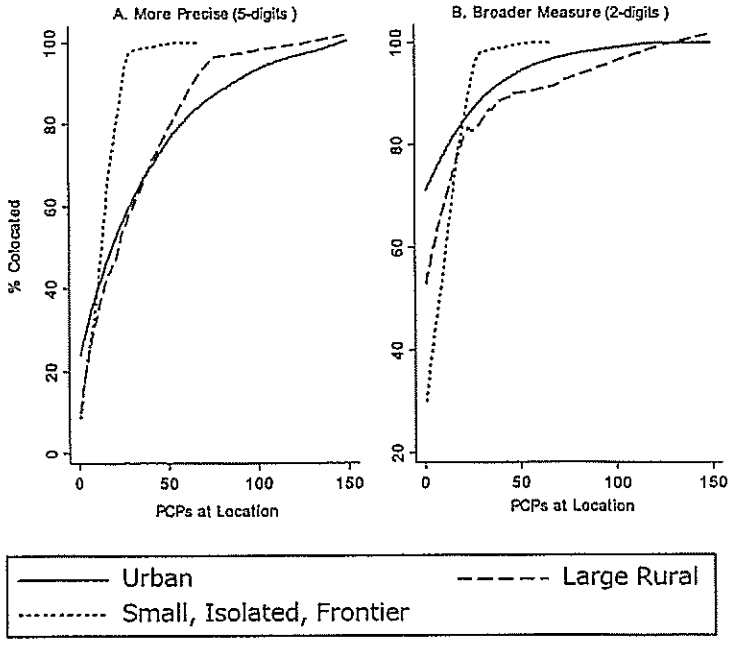
Size and Location	Rurality Only	Rurality and Size	Rurality-Size Interaction
Urban	Reference	Reference	Reference
Large rural	0.552 (0.533–0.571)*	0.758 (0.730–0.787)*	0.921 (0.843–1.006)
Small rural	0.430 (0.410–0.452)*	0.790 (0.750–0.832)*	0.589 (0.515–0.672)*
Isolated rural	0.439 (0.400–0.482)*	1.063 (0.961–1.174)	0.807 (0.652–0.999)†
Frontier	0.537 (0.489–0.590)*	1.289 (1.166–1.425)*	1.118 (0.899–1.391)
ln(size)		2.676 (2.650–2.703)*	2.678 (2.650–2.706)*
Large rural*ln(size)			0.907 (0.871–0.944)*
Small rural*ln(size)			1.185 (1.105–1.269)*
Isolated rural*ln(size)			1.214 (1.066–1.381)*
Frontier rural*ln(size)			1.106 (0.966–1.265)

Data are odds ratios (95% confidence intervals). Data are from the National Plan and Provider Enumeration System 2010 and the American Medical Association Masterfile 2010. The analysis is based on 207,955 primary care physicians in direct patient care. Ln(size) is the natural log of the number of primary care physicians located at the same location (street address). Colocation of primary care physicians and behavioral health providers also is based on the same, more precise location. The outcome variable for the three models is colocation of primary care physician with behavioral health providers.
*Significant at 1%.
†Significant at 5%.

providers. Although PCPs may share an address with behavioral health providers, they may have no interaction with each other. Conversely, a rural physician may work closely with a psychologist a few towns over. The measure of colocation used in this article can serve as a valuable indicator of a potential relationship that could provide the basis for policies aimed at improving mental health care within primary care settings.

Another limitation of the data are that addresses analyzed and geocoded in both data sets are self-reported and contain inaccuracies. While the geo-

Figure 3. Association between colocation and primary care physicians (PCPs) at location.



coding process strives to use the best possible address and apply the most accurate assignment of the longitude and latitude points, approximately 3% of addresses are geocoded at the 5-digit ZIP code. In addition, some health care providers may report their home or billing addresses rather than their practice address.

Since the NPI is required only for billing purposes, some providers may not be included in the NPPES. Furthermore, the NPPES database may overestimate the number of providers: all providers with an NPI are assumed to actively deliver clinical services, and providers who have retired have not necessarily been eliminated from the data. By combining NPPES data with AMA Masterfile data, we reduced the likelihood of overcounting physicians by including only those in direct patient care. Without a "master file" for behavioral health providers, we could not make a comparable correction for them.

Discussion

Successful expansion of integrated primary care delivery will require an array of strategies and interprovider arrangements, including in-house behavioral health staffing, coordination with proximal outside providers, and teleconsultation. Policymakers hoping to accelerate integration must first understand where the delivery of behavioral health and primary care services currently intersect and diverge. Absent this knowledge, policymakers will unlikely be able to recognize immediate opportunities for integration. Further, without a more complete understanding of where integration possibilities are, policymakers may not be able to ascertain where integration may simply need minimal incentives to occur and those geographical areas where greater policy and payment will need to be leveraged. Unfortunately, the current extent and distribution of primary care and mental health colocation and integration as it relates to provider density and practice proximity is unknown. In this article, we illuminated where behavior health and primary care proximity might offer a proxy for *potential* collaboration possibilities and where alternative strategies and support are likely needed to propel the integration of primary care and mental health forward to improve the health care delivery system for Americans.

The degree to which PCPs are colocated with behavioral health providers is positively associated with practice site size. This association explains some but not all the observed differences across level of rurality. While there are few large sites in more rural areas, findings show that they do exist, and they almost always contain a behavioral health provider. These findings suggest that support for integration in smaller practices is needed and adds to the growing call for facilitating change among smaller primary care practices.[17] Current providers who have been trained as solo practitioners may need additional assistance and would benefit from training in the effective delivery of team-based care. Awareness of proximity informs opportunities for not only full integration of care but also coordination of care when integration is not possible or desired.

While some limitations of our colocation method to understand relationships between primary and behavioral health care providers are obvious, several are, nonetheless, worth noting. To understand national workforce patterns, we made opportunistic use of secondary and administrative data, which do not include information about actual employment, referral, or other relationships between providers nor evidence to understand where patient sharing is actually occurring. Our results can, therefore, only speak to the degrees to which potential relationships occur or could occur; for example, a part-time or even a full-time professional colocated within a primary care practice may be primarily employed at a mental health organization outside of the primary care practice building. Our results are best suited to demonstrating gaps in proximity, and our findings are consistent with well-documented shortages in rural areas of primary care mental health providers independent of one another.[18–21] A plausible explanation of the low rates of colocation in rural areas is the absence of behavioral health providers. Recruiting and retaining these providers in rural areas is complicated because of economic, geographic, and sociocultural characteristics.[21] Broadening the use of small-business loans, debt relief, enhanced infrastructure for telehealth opportunities, and additional payment incentives like those found to be beneficial in regional and international settings should all be considered among efforts to recruit and retain both PCPs and behavioral health providers in rural areas.[20,22,23] Incentive plans and innovative curricula also are needed to encourage behavioral health providers to train for the provision of services within a primary care environment.[24–27]

Conclusions

Despite evidence showing that integrating behavioral health care into primary care can improve patient outcomes[28] and decrease health care costs,[2] there remain many unanswered questions about who is integrating and where.[29] Among these are payment policies separating physical and behavioral health care, workforce distribution, and supply deficiencies, particularly in rural areas.

The challenges inherent to delivering integrated primary care among physicians in smaller practices and in rural settings are many, as are the strategies required for their mitigation. To realize this potential, policies that both encourage and support integration are needed. Several key processes are needed to enable primary care providers to collaborate better with behavioral health providers: increased reimbursement and education at the practice level,[7] workforce expansion, shared training, payment reform that favors team approaches, outcomes and population-based care to balance the isolating effects of fees for service, telehealth initiatives, and other incentives that support shared care. As we continue to better understand the importance of integration efforts, support can take place at the local community level as well as through state-based and national initiatives.

The United States must address the problem of fragmentation in health care delivery, and better integration of its health workforce through innovative delivery models is a critical first step. The inclusion of behavioral health providers into the largest platform of health care delivery, primary care, is an essential step toward the achievement of the nation's triple aim of decreasing overall health care cost, improving outcomes, and enhancing the patient experience.[30] Understanding their current proximity and gaps in colocation is a critical first step—one that we hope galvanizes further research to understand how such proximity affects the actual team-based integrated care delivery and population health.

References

1. Hoffman C, Rice D, Sung HY. Persons with chronic conditions. Their prevalence and costs. JAMA 1996; 276:1473–9.
2. Simon GE, Katon WJ, VonKorff M, et al. Cost-effectiveness of a collaborative care program for primary care patients with persistent depression. Am J Psychiatry 2001;158:1638–44.
3. Simon GE, VonKorff M, Barlow W. Health care costs of primary care patients with recognized depression. Arch Gen Psychiatry 1995;52:850–6.
4. deGruy F. Mental health care in the primary care setting. In: Donaldson MS, Yordy KD, Lohr KN, Vanselow NA, eds. Primary care: America's health in a new era. Washington, D.C.: Institute of Medicine; 1996:285–311.
5. Butler M, Kane RL, McAlpin D, et al. Integration of mental health/substance abuse and primary care. Evidence reports/technology assessments, no. 173 Rockville, MD: Agency for Healthcare Research and Quality; 2008. Available from: http://www.ncbi.nlm.nih.gov/books/NBK38632/. Accessed March 10, 2014.
6. Collins C, Hewson DL, Munger R, Wade T. Evolving models of behavioral health integration in primary care. May 2010. Available from: http://www.milbank.org/uploads/documents/10430EvolvingCare/10430EvolvingCare.html. Accessed March 10, 2014.
7. Robinson PJ, Reiter JT. Behavioral consultation and primary care: a guide to integrating services. New York: Springer; 2007.
8. Miller BF, Kessler R, Peek CJ, Kallenberg GA. A national agenda for research in collaborative care. Papers from the Collaborative Care Research Network Research Development Conference. Rockville, MD: Agency for Healthcare Research and Quality; 2011. Available from: http://www.ahrq.gov/research/findings/final-reports/collaborativecare/collabcare.pdf. Accessed March 10, 2014.
9. Miller BF, Petterson S, Teevan Burke B, Phillips RL. Proximity of providers: colocating behavioral health and primary care and the prospects for an integrated workforce. Am Psychol. In press.
10. Peek CJ, National Integration Academy Council. Lexicon for behavioral health and primary care integration: concepts and definitions developed by expert consensus. Rockville, MD: Agency for Healthcare Research and Quality; 2013. Available from: http://integrationacademy.ahrq.gov/sites/default/files/Lexicon.pdf. Accessed March 10, 2014.
11. Sieber WJ, Miller BF, Kessler RS, et al. Establishing the Collaborative Care Research Network (CCRN): a description of initial participating sites. Fam Syst Health 2012;30:210–23.
12. Frequently asked questions about the national provider identifier (NPI). Updated November 22, 2000. Available from: http://aspe.hhs.gov/admnsimp/faqnpi.htm. Accessed March 10, 2014.
13. WWAMI Rural Health Research Center. RUCA data. Travel distance and time, remote, isolated, and frontier. Available from: http://depts.washington.edu/uwruca/ruca-travel-dist.php. Accessed December 8, 2013.
14. Petterson SM, Phillips RL, Bazemore AW, Koinis GT. Unequal distribution of the U.S. primary care workforce. Am Fam Physician 2013;87:Online. Available from http://www.graham-center.org/

online/graham/home/publications/onepagers/2013/unequal-distr.html. Accessed March 10, 2014.
15. Petterson S, Burke M, Phillips R, Teevan B. Accounting for graduate medical education production of primary care physicians and general surgeons: timing of measurement matters. Acad Med 2011;86:605–8.
16. Health Resources and Services Administration, Bureau of Health Professions. Projecting the Supply and Demand for Primary Care Practitioners through 2020. November 2013. Available from: http://bhpr.hrsa.gov/healthworkforce/supplydemand/usworkforce/primarycare/. Accessed March 10, 2014.
17. Nutting PA, Crabtree BF, McDaniel RR. Small primary care practices face four hurdles–including a physician-centric mind-set–in becoming medical homes. Health Aff (Millwood) 2012;31:2417–22.
18. The number of practicing primary care physicians in the United States. Primary care workforce facts and stats no. 1. AHRQ publication no. 12-P001-2-EF. 2011; Rockville (MD): Agency for Healthcare Research and Quality; 2011. Available from: http://www.ahrq.gov/research/pcwork1.htm. Accessed January 3, 2012.
19. American Psychological Association Center for Workforce Studies. How many practicing psychologists are there in the United States? Available from: http://www.apa.org/support/about/psych/numbers-us.aspx#answer. Accessed January 29, 2012.
20. Robiner WN. The mental health professions: workforce supply and demand, issues, and challenges. Clin Psychol Rev 2006;26:600–25.
21. Buykx P, Humphreys J, Wakerman J, Pashen D. Systematic review of effective retention incentives for health workers in rural and remote areas: towards evidence-based policy. Aust J Rural Health 2010;18:102–9.
22. Ivey SL, Scheffler R, Zazzali JL. Supply dynamics of the mental health workforce: implications for health policy. Milbank Q 1998;76:25–58.
23. Australian Government, Department of Human Services. Medicare. Telehealth. Updated January 7, 2013. Available from: http://www.medicareaustralia.gov.au/provider/incentives/telehealth/. Accessed September 6, 2013.
24. The White House, Office of the Press Secretary. President announces new jobs initiatives for rural America. Press release, August 16, 2011. Available from: http://www.whitehouse.gov/the-press-office/2011/08/16/president-announces-new-jobs-initiatives-rural-america. Accessed September 6, 2013.
25. Blount A, DeGirolamo S, Mariani K. Training the collaborative care practitioners of the future. Fam Syst Health 2006;24:111–9.
26. Blount FA, Miller BF. Addressing the workforce crisis in integrated primary care. J Clin Psychology Med Settings 2009;16:113–9.
27. Kessler R, Stafford D, Messier R. The problem of integrating behavioral health in the medical home and the questions it leads to. J Clin Psychol Med Settings 2009;16:4–12.
28. Unutzer J, Katon W, Callahan CM, et al. Collaborative care management of late-life depression in the primary care setting. JAMA 2002;288:2836–45.
29. Kathol RG, Butler M, McAlpine DD, Kane RL. Barriers to physical and mental condition integrated service delivery. Psychosom Med 2010;72:511–8.
30. Berwick DM, Nolan TW, Whittington J. The triple aim: care, health, and cost. Health Aff (Millwood) 2008;27:759–69.