Using School-Based Interventions for Depression Education and Prevention

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Abstract

Depression is the most burdensome noncommunicable condition among young persons aged 10–24 years, with rates of depression rising steeply during the post-pubertal period corresponding to the intermediate and secondary school years. Although a high number of children and adolescents experience depressive symptoms or clinical depression, many will not or cannot access health services, and the number of potential cases cannot be dealt with entirely by the health-care system. As such, a public health perspective, which encourages the application of mental health promotion and primary and early secondary prevention, has gained increasing acceptance, as represented by the expansion of school-based depression and mental health interventions. The objective of this chapter is threefold. First, it provides an overview of the accomplishments in school-based depression intervention and mental health promotion and prevention research by presenting both universal and selective prevention approaches, which are delivered prior to the onset of symptoms or a diagnosis. Second, the chapter showcases two successful school-based intervention programs and presents guidance on how to implement each of these models. Third, the chapter discusses limitations in the field, highlights recommendations for implementation, and offers a roadmap for potential future avenues for research, including lessons for adaptation of programs to allow translation to other settings and nations.

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1.1   Introduction

Depression is the most burdensome noncommunicable condition among young people aged 10–24 years [1], with rates of depression rising steeply during the intermediate and secondary school years [2, 3]. Depression adversely affects developmental trajectories in adolescents and is strongly associated with functional impairment [4], comorbid mental disorders, recurrent depression in adulthood, and risk for suicide [5]. Adolescent depression is also linked with substance use [6–8], negative self-perception, social problems, and impaired academic performance [9]. While current depression research primarily focuses on treatments for acute symptom relief and relapse prevention, primary and early secondary prevention efforts may be more cost-effective [10, 11] and have been shown to minimize the individual and public health burden of depression by preventing between 22% and 50% of cases of depression (as cited in [12]). Successful early secondary prevention can help in the prompt identification and treatment of depression in youth and can lead to a number of positive health and behavioral outcomes, including increased social engagement and educational attainment and decreased suicidal and self-injurious behavior [5]. Indeed, recognizing depressive illnesses as early as possible is a crucial step in managing depression more effectively and preventing negative outcomes and tragedies in our schools and communities.

1.2   A Global Perspective

To appreciate a global perspective on the burden of depression among adolescents and young adults, research efforts should include youth from low- and middle-income countries (LMIC) in addition to their high-income counterparts. The youth from LMICs face the largest share of worldwide adversity and risk exposure and, among other pressing health problems, experience high rates of depression [1]. In addition, adolescents and young adults have the lowest rate of health-care coverage worldwide [13]. This difficulty in obtaining treatment via traditional health-care services for the youth has led to consideration of a number of novel approaches, including school-based health promotion and prevention programs. However, given that many low-resource settings cannot afford to implement such programs, limited research in LMICs in effective depression prevention and treatment strategies for young people are available to date [14]. As such, we are primarily reliant on studies undertaken in high-income countries. A recent review by Fazel and colleagues [15] offers some evidence for the translation of programs from high-income to LMIC and comments on mental health interventions designed specifically in LMIC schools; it also discusses service development priorities in this region of the world.

1.3   Barriers to Early Detection and Intervention

The most notable barriers to the early identification and treatment of depressive and related disorders among individual adolescents include stigma (a circumstance or quality that elicits negative attitudes and beliefs), problems recognizing symptoms as being related to an underlying psychological problem (poor mental health literacy), a preference for self-reliance, and failure to perceive a need for help [16, 17]. Mental illness stigma has emerged as a significant barrier to help-seeking and treatment [16, 18]. Depression stigma includes both self-stigma, which occurs when one internalizes the public's stigmatizing attitudes about depression, and perceived stigma, which is the belief that the public holds stigmatizing thoughts or stereotypes about depression [19]. These negative self-views compound the already distressing symptoms that are characteristic of most mental disorders [17]. Another potential barrier is engaging the youth in intervention programs, particularly when there are sensitivities around mental health issues. These barriers, along with issues of accessibility, including treatment cost, location, and time, make it extremely challenging to effectively reach young people who are in need of help [20, 21].

1.4   Official Recommendations

Although mental disorders have largely been overlooked within the global health agenda [22], several well-known organizations have recently highlighted the importance of promotion of mental health and prevention of mental disorders. One of the primary goals of the Grand Challenges in Global Mental Health Initiative, funded in part by the National Institute of Mental Health, includes advancing prevention and the implementation of early interventions to improve the lives of people living with mental illnesses, including depressions [23]. The World Health Organization's Comprehensive Mental Health Action Plan (CMHAP) recommends that children and adolescents with mental disorders be provided with early evidence-based interventions based in the community [24]. The National Strategy for Suicide Prevention also calls for public health approaches that increase knowledge and awareness in support of early identification of risk [25]. Moreover, a report published by the Institute of Medicine (IOM) of the United States [26] recommends implementing preventative interventions among young people in order to avoid substantial costs to individuals and society. Finally, the most recent Lancet Commission on adolescent health and well-being notes that there is a clear need for innovation and more sustained effects of mental health interventions [27].

1.5   Core Concepts and Definitional Issues

Recent decades have witnessed a shift toward early intervention paradigms for improving mental health and reducing mental disorders in young people. Depression prevention may occur on three distinct levels (primary, secondary, tertiary) that aim to reduce risk factors for depression (or recurring depression), as well as enhance the protective factors that promote mental health. *Primary prevention* of depression aims to prevent depression by intervening prior to its onset. Three distinct IOM prevention models (universal, selective, and indicated) to reduce rates of depression and other mental illnesses have been proposed in the literature [28] and are classified as primary prevention. Universal interventions are delivered to all children and adolescents irrespective of symptoms or risk. Selective interventions target groups of children and adolescents with specific risk factors that increase their likelihood of developing a depressive disorder, such as having a depressed parent. Finally, indicated interventions target children and adolescents with early signs or symptoms of depression. *Secondary prevention* of depression aims to prevent depression from progressing to symptomatic disease through early detection and treatment, while *tertiary prevention* aims to reduce disability and prevent depression relapses and recurrences [29].

Whereas depression prevention is focused on avoiding disease, depression promotion is focused on maximizing health, mood states, and well-being. Though promotion and early prevention have different goals, both interventions aim to alter developmental processes and trajectories [26]. Moreover, effective promotion of health and well-being in childhood may enhance prospects for prevention. For example, promotion interventions may increase resilience to adversity in children, which can then act as a protective factor, reducing the likelihood of onset of mental disorders in the future [30]. The most common health promotion interventions in this field are based on mentoring and youth development models or some combination of these approaches. Most interventions target adolescents, with few reports about approaches to or benefits for younger school-age children (5–11 years) [31]. Mental health promotion particularly aims to establish competencies, increase the completion of developmentally appropriate tasks, enhance the chances of positive development, and strengthen an individual's adaptability and tolerance of adversity [26, 32, 33]. As such, the goals can be seen to overlap with those for primary prevention of mental disorders. The specific examples we provide in this chapter, namely, The University of Michigan Peer-to-Peer Depression Awareness Campaign (P2P) and SPARX-R, are principally prevention strategies rather than health promotion strategies.

1.6   Key Strategies: Reaching Adolescents and Young Adults

The need to reduce depression at a population level in adolescents and young adults has led to greater interest in prevention programs. A majority of this research has been in high-income countries (HICs); the research we discuss below primarily

focuses on children and adolescents from these nations. To date, depression research does not definitively favor one type of intervention over another [34–36], but some sources suggest that universal depression prevention interventions have mixed results and demonstrate lower levels of statistical significance than targeted programs [37–40]. A possible explanation for this is that there is greater potential for change among youth who have subclinical symptoms or are at increased risk for the disorder, since initial symptom levels are likely to be higher [40, 41]. Indeed, youth with depressive symptoms may benefit most from universal depression programs [42]. Advocates of universal and selective interventions argue that such programs provide both the potential for immediate symptom reduction and the tools to sustain psychological well-being in the general population by building young people's resilience and capacity to deal with depression or other problems in the future. As universal interventions are delivered in community settings such as everyday school environments, they are less stigmatizing of already vulnerable students and may be more cost-effective by reaching many youth at once [43]. Whereas universal interventions capture everyone who might develop depression in the future, targeted interventions may fail to capture individuals who are symptomatic but do not meet the criteria to be considered at risk or clinically depressed. Universal mental health programs may also encourage schools to address the emotional problems of previously unidentified and untreated youth [21]. In order to highlight the benefits of primary prevention interventions, this chapter covers both universal and selective prevention approaches, which are delivered prior to the onset of symptoms or a diagnosis.

The early age of onset of depression and the high number of children and adolescents who suffer from depressive symptoms or clinical depression have prompted the expansion of school-based depression and mental health interventions. Schools play a key role in students' social, academic, cognitive, emotional, and behavioral development and, in turn, mental health [27]. As a place of learning, schools enable youth to acquire and practice skills in a real-world context. Given that youth spend more time in school than any other formal institutional structure [21], the school setting is a relatively unthreatening environment in which a majority of youth can be reached.

1.7   Overview of School-Based Interventions for Depression Education and Prevention

In the past decade, researchers have conducted a number of randomized controlled trials to evaluate prevention-focused interventions in schools. These studies, in addition to several recent meta-analytic reviews, have demonstrated the promise of delivering depression prevention programs in the school system [15, 37–39, 44–47]. Table 1.1 presents an overview of 35 school-based therapeutic depression prevention programs [41, 43, 48–80]. Table 1.2 presents an overview of four school-based depression education programs [42, 81–83]. The inclusion criteria were: (a) study participants were children or adolescents; (b)

Table 1.1 School-based therapeutic depression prevention programs

Study	Country	Program	Preventive approach	Program content	Number of sessions	Sample	Intervention providers	Depression outcome measure
Arnarson and Craighead 2011	Iceland	NR	Selective and indicated	CBT	14	14–15 years (n = 171)	School psychologists	CDI
Barrett et al. 2006	Australia	FRIENDS	Universal	CBT	10	6th and 9th grade (n = 669)	Teachers	CDI
Calear et al. 2009	Australia	MoodGYM: YouthMood project	Universal	iCBT	5	12–17 years (n = 1477)	Computer (teacher assisted)	CES-D
Cardemil et al. 2007	The United States	PRP	Universal (selective stratification)	CBT	12	Middle school children (n = 168)	Graduate students, undergraduate student assistants	CDI
Chaplin et al. 2006	The United States	PRP	Universal	CBT	12	11–14 years (n = 208)	School personnel	CDI
Cutuli et al. 2006	The United States	PRP	Selective	CBT	12	NR (n = 294)	NR	CDI
Garber et al. 2009	The United States	CB prevention program	Selective	CBT	8	13–17 years (n = 316)	MHP	CES-D
Gillham et al. 2007	The United States	PRP	Universal	CBT	12	11–14 years (n = 697)	School personnel, graduate students	CDI + CDRS-R
Gillham et al. 2012	The United States	PRP-A	Selective	CBT + IPT	10	10–15 years (n = 408)	School personnel	CDI
Horowitz et al. 2007	The United States	CWSC; IPT-AST	Universal	CBT + IPT	8	14–15 years (n = 380)	MHP, psychology students	CDI

Johnstone et al. 2014	Australia	AOP-PTS	Universal	CBT	10	9–10 years ($n = 370$)	Teachers	CDI
Kindt et al. 2014	The Netherlands	OVK	Selective	CBT	16	11–16 years ($n = 1343$)	Teachers	CDI
Lowry-Webster et al. 2003	Australia	FRIENDS	Universal	CBT	10	10–13 years ($n = 594$)	Graduate students	CDI
Manz 2001	Germany	GO!	Universal (indicated and selective stratification)	CBT	8	15–17 years ($n = 929$)	Supervised trainers	BDI
Merry et al. 2004	New Zealand	RAP-Kiwi	Universal	CBT + IPT	11	13–15 years ($n = 392$)	Teachers	BDI-II + RADS
Pattison and Lynd-Stevenson 2001	Australia	PRP	Universal	CBT	11	9–12 years ($n = 63$)	MHP	CDI
Perry et al. 2015	Australia	SPARX-R	Universal	iCBT	7	16–18 years $N = 1600$ (target)	Computer (teacher assisted)	MDI
Pössel et al. 2004	Germany	LISA-T	Universal	CBT	10	13–14 years ($n = 347$)	MHP, graduate students	CES-D
Pössel et al. 2011	Germany	LARS and LISA	Universal	CBT	10	13–14 years ($n = 301$)	MHP, graduate students	SBB-DES
Pössel et al. 2013	The United States	LARS and LISA	Universal	CBT	10	14–16 years ($n = 518$)	MHP, graduate students	CDI

Table 1.1 (continued)

Study	Country	Program	Preventive approach	Program content	Number of sessions	Sample	Intervention providers	Depression outcome measure
Quayle et al. 2001	Australia	PRP	Universal	CBT	8	11–12 years (n = 42)	MHP	CDI
Raes et al. 2014	Belgium	Mindfulness program	Universal	MBCT	8	13–20 years (n = 408)	MHP	DASS
Rivet-Duval et al. 2011	Mauritius	RAP	Universal	CBT + IPT	11	12–16 years (n = 160)	Teachers	RADS-2
Roberts et al. 2003	Australia	PRP	Universal	CBT	12	11–13 years (n = 189)	MHP	CDI
Roberts et al. 2010	Australia	AOP	Universal	CBT	20	11–13 years (n = 496)	Teachers	CDI
Rooney et al. 2006	Australia	PTP	Universal (indicated stratification)	CBT	8	8–9 years (n = 136)	MHP	CDI
Rose et al. 2014	Australia	RAP + PIR	Universal	CBT + IPT	20	9–14 years (n = 210)	Graduate students	RADS-2
Sawyer 2010	Australia	Beyond blue	Universal	CBT	10	8th grade (n = 5633)	NR	CES-D
Sheffield et al. 2006	Australia	PSFL	Universal, indicated, combined	CBT	8	14–15 years (n = 1045)	Teachers	CDI + CES-D
Shochet et al. 2001	Australia	RAP-A + RAP-F	Universal	CBT	10	9th grade (n = 260)	MHP, graduate students	CDI + RADS + BHS
Stallard et al. 2012	The United Kingdom	RAP	Universal (indicated stratification)	CBT + AC	9 + 2 booster	12–16 years (n = 1064)	Trained professionals	SMFQ
Spence et al. 2005	Australia	PSFL	Universal	CBT	8	12–14 years (n = 1500)	Teachers	BDI

Tak et al. 2015	The Netherlands	OVK	Universal	CBT	12	8th grade (n = 1341)	MHP	CDI
Wahl et al. 2014	Germany	LARS and LISA	Universal	CBT	10	13–14 years (n = 648)	MHP, teachers	CES-D
Wong et al. 2014	Australia	TWU	Universal	CBT	10	15–16 years (n = 976)	Computer (teacher assisted)	PHQ-9

Table 1.2 School-based depression education programs

Study	Country	Program	Preventive approach	Program content	Number of sessions	Sample	Intervention providers	Depression outcome measure
Schilling et al. 2016	The United States	SOS	Universal	EDU	Semester of classes	9th grade (n = 1052)	School personnel	Knowledge and attitudes about depression
Swartz et al. 2010	The United States	ADAP	Universal	EDU	3	14–15 years (n = 3538)	Mental health professionals	ADKQ
Tomyn et al. 2016	Australia	THW	Universal	EDU	6	13–17 years (n = 252)	Mental health professionals	SMFQ
Parikh et al. in press	The United States	Michigan P2P	Universal	EDU	Year-long	14–17	Peers	P2P depression awareness questionnaire

Note: ADAP Adolescent Depression Awareness Program, *ADKQ* Adolescent Depression Knowledge Questionnaire, *AOP* Aussie Optimism Program, *AOP-PTS* Aussie Optimism Program: Positive Thinking Skills, *BDI* Beck's Depression Inventory, *BHS* Beck Hopelessness Scale, *CES-D* Center for Epidemiologic Depression Scale, *CDI* Children's Depression Inventory, *CBT* Cognitive Behavioral Therapy, *CWSC* Coping With Stress Course, *DASS* Depression Anxiety Stress Scale, *EDU* Education, *iCBT* Internet Cognitive Behavioral Therapy, *IPT* Interpersonal Therapy, *IPT-AST* Interpersonal Psychotherapy-Adolescent Skills Training, *MHP* Mental Health Professional, *NR* Value not Reported, *OVK* Op Volle Kracht, *PHQ-9* Patient Health Questionnaire-9, *PIR* Peer Interpersonal Relatedness Program, *PRP* Penn Resiliency Program, *PTP* Positive Thinking Program, *PSFL* Problem Solving for Life, *RAP* Resourceful Adolescent Program, *RAP-A* Resourceful Adolescent Program-Adolescent, *RAP-F* Resourceful Adolescent Program-Family, *RAP-Kiwi* Resourceful Adolescent Program-New Zealand version, *RADS* Reynolds Adolescent Depression Scale, *RADS-2* Reynolds Adolescent Depression Scale – 2nd. Ed., *SBB-DES* Measure of Child and Adolescent Major Depression and Dysthymia Symptoms, *SMFQ* Short Mood and Feelings Questionnaire, *SOS* Signs of Suicide Program, *THW* Think Health and Wellbeing, *TWU* The Thiswayup Schools Depression Intervention

a primary prevention approach was employed (i.e., universal or selective); (c) the primary aim was depression prevention or mental health promotion; (d) the intervention was school-based (delivered as part of the school curriculum or as an after school activity); (e) the study was published in a peer-reviewed, English language journal in the past 15 years; and (f) when two or more studies by the same author(s) have overlapping data and results, the older of two studies was excluded.

Broadly speaking, two types of school-based interventions have been explored: [1] formal therapeutic depression prevention programs and [2] broader mental health education and anti-stigma campaigns. However, as evidenced from our overview of existing school-based depression prevention programs, most can be categorized as therapeutic prevention programs. Each approach has its merits and limitations. Depression prevention programs feature a highly structured approach requiring strict adherence to detailed manuals and procedures to ensure standardization, which is admirable, but also creates an approach that can be inflexible and difficult to adapt to the needs of each school. Additionally, this often relies on external health professionals rather than empowering school staff to sustain the program or to manage self-referrals.

Broader mental health and anti-stigma campaigns offer another approach: delivering a purely educational intervention to address depression literacy in high schools, which is not designed to change mood or emotions. One example is the Adolescent Depression Awareness Program (ADAP) from Johns Hopkins, an empirically supported school-based curriculum designed to teach depression literacy to high school students to improve knowledge and lessen attitudinal barriers surrounding depression [84]. ADAP features a three-hour curriculum taught by health professionals during health class and has been demonstrated to improve knowledge in two studies [82] and to improve self-identification of depression in one of these studies [85]. These findings have not been replicated, nor have impacts on depression stigma been reported. Such health education campaigns may benefit from several principal characteristics of effective prevention programming, including (a) providing contact with adults and peers in a way that promotes strong relationships and supports positive outcomes; (b) tailoring the program to the community and cultural norms of the participants; and (c) including the target group in program planning and implementation [86].

This chapter will specifically showcase two unique models of successful school-based intervention programs and present guidance on how to implement each of these types of programs, as well as lessons for adaptation of different programs to other settings and nations.

1. The University of Michigan Peer-to-Peer Depression Awareness Campaign (P2P): The P2P project is a well-established universal peer-to-peer program with eight years of outcome data from high school students. The P2P program uses a novel peer-to-peer approach of program delivery. The target outcome is a melange of mental health literacy, depression symptom reduction, suicide reduction, and stigma reduction.

2. SPARX-R: SPARX-R is a universal intervention that uses a novel online, CBT-based, gamified technology designed to prevent the development of depression in high school students. Derived from its parent treatment program, SPARX [87], it has been tested to see whether it can prevent depression in young people approaching their final year exams. The primary target outcome for this trial was a reduction of depression symptoms prior to the final school exams.

Given the theoretical value, and the solid evaluation results from these two approaches (shown later), they may serve as useful models for other settings. To facilitate uptake, this chapter will add comments as "Implementation Tips for Other Settings" or "Lessons Learned" after key sections.

1.8   The P2P Project: A Prototype for Schools Worldwide?

One common philosophy is "think global, act local." We begin by describing a local project that we believe has global applicability. In response to the growing awareness of the importance of adolescent depression and the hands-on role children and adolescents can play in educating their peers, the University of Michigan Depression Center (UMDC) and the Ann Arbor Public Schools (AAPS) developed and implemented the Peer-to-Peer Depression Awareness Campaign (P2P) in Washtenaw County schools. The P2P project aims to empower high school students as both learners and educators. The goals of the project are to (1) educate high school students about clinical depressions, stress, sleep disturbances, known precipitants, and (2) support them in finding creative ways to convey this knowledge to their peers to reduce stigma, raise awareness, encourage help-seeking when needed, and help to promote earlier detection of depressions, bipolar disorders, and related illnesses. Unlike the large majority of extant school-based prevention programs in the available literature, the P2P program employs a peer-to-peer framework that is largely "bottom-up" rather than "top-down." As explained below, there are a number of significant benefits to this type of model.

1.8.1   P2P Development

Over a period of 5 years, the number of young adults in Washtenaw County, a small region near Detroit, Michigan, with a population of approximately 350,000, reporting ten or more poor mental health days in the past month more than doubled [88]. Moreover, schools in the AAPS district began requesting educational presentations about depression, stress, and other mental health concerns from the UMDC for their students. In response, the UMDC and AAPS began a collaboration to provide depression awareness and suicide prevention education, training, and support to AAPS personnel.

The AAPS Initiative was designed to (1) address the need for early recognition of depression, bipolar disorder, and risk for suicide among youth; (2) educate

teachers, counselors, and other "frontline" personnel working with young people to raise their awareness and knowledge of depressive and bipolar illnesses and suicide risk factors; (3) and provide professional development to school personnel using a "train-the-trainer" model, so that staff members in each school would be qualified to train their colleagues in suicide awareness and prevention techniques. A planning committee comprised of several AAPS teaching staff and administrators and two UMDC staff members guided this initiative. The planning committee was created to inform the project and ensure that the school system was a full partner in developing a training and education model that would best serve the needs of the district. In addition, the goals of the partnership were aligned with the Washtenaw County Health Improvement Plan, which identified depression as one of the four primary focus areas for the 2020 objectives [88].

A peer-based student education component called the P2P project became the centerpiece of the UMDC and AAPS Initiative in 2009. The project was initially conceptualized and designed as a community education and outreach initiative in high schools without emphasis on a rigorous scientific research or evaluation methodology. However, encouraging preliminary results and anecdotal evidence indicated that the P2P program warranted formal evaluation. In 2010, the project coordinators added a new research and evaluation component to obtain data about the effects of the program on knowledge of depressive illnesses, stigma associated with depressive illnesses, and awareness of help-seeking behaviors linked with depressive illnesses among high school students. Recent evaluation results are discussed later in this chapter and suggest the high acceptability and effectiveness of this program.

Since the P2P project's inception, the UMDC has provided education and resources to support participating high school students in developing innovative ideas to effectively reach their peers with depression awareness and stigma reduction messages. While some have suggested caution around peer-to-peer programs [89], this concern was primarily driven by cases in which adolescents indiscriminately share their stories about personal experiences of mental illness and recovery with peers, which is distinct from the P2P program approach.

A number of peer-delivered interventions involve individuals with a mental illness providing a support intervention to their peers [89–91]. In this case, P2P students are *not* screened for depression and are *instead* selected for their leadership skills. The P2P students do not provide any kind of "peer counseling"—rather, they are "peer advocates" who help to create a supportive environment in their schools and connect their peers with appropriate resources, information, and appropriate venues for clinical interventions.

1.8.1.1 Implementation Tips for Other Settings

1. Establishing a partnership between a medical center/university and a school district is extremely valuable and necessary to ensure proper buy-in by the schools. Furthermore, such a partnership ensures appropriate educational content is delivered along with accurate information about appropriate use of health-care facilities for any particularly ill students.

2. While teachers and school personnel must be trained in depression prevention and support the school intervention program, they are not the main deliverers of the intervention; the students are. The local culture must be able to identify and respect the capacity of students to be the "intervention" and must be able politically to grant students the authority to act.
3. Since the students are the main instigators of the intervention, they will need ongoing training and support as they implement the peer-to-peer intervention. The school authorities—and to a small extent, the medical center/university authorities—must have the time and resources to provide ongoing supervision for the overall program.

1.8.2   How Did We Choose Participants?

The P2P program has been carried out in Washtenaw County since 2009. More schools in Washtenaw County were recruited in 2011–2012 under a pilot expansion. Interest in the program continues to grow, with the number of participating schools increasing from five Ann Arbor high schools in 2009 to ten high schools throughout Washtenaw County during the 2015–2016 academic year. Since the program began in 2009, over 550 students have participated directly on P2P teams in 11 different schools across Washtenaw County, over 150 P2P student-run events have taken place, and thousands of students have been reached through the awareness campaigns.

Two samples of students were selected from each high school.

1. Students who participated in the P2P projects (referred to as "P2P team members").
2. Students who did not participate in the P2P projects (referred to as "non-P2P students").

Recruitment of P2P students involved teachers and counselors selecting student "champions" from all grade levels for participation. In addition, any student who expressed an interest in becoming involved was considered for participation. Schools with many students expressing an interest have developed official applications for participation. Recruitment of the non-P2P student sample was conducted by collaborators at each high school. Due to the community-based participatory nature of the proposed project, the sample sizes were determined by interest and engagement of students at each school. The institutional review board (IRB) waived the need for informed consent from participants; the study received exemption under the category of normal educational practices.

1.8.2.1 Implementation Tips for Other Settings
1. An identified group of student champions to be the heart of the peer-to-peer intervention is needed. These students will need political support to be allowed to implement these activities.
2. Collaborators at each school should help researchers recruit a student comparison sample.

1.8.3 What Program Did We Institute in the Schools?

The intervention, based in part on the ADAP framework [84], features (a) an educational component to train P2P team members on broad mental health issues and teach them to develop and implement a variety of strategies to spread important depression awareness and mental health information in their schools and (b) a peer-to-peer component in which these individuals provided peer-to-peer advocacy. P2P team members first attended a six-hour, one-day Kickoff Conference at the UMDC that covered the latest evidence-based information as well as social marketing strategies, active listening skills, and other peer support resources. Students were encouraged to brainstorm ideas for developing tailored public awareness campaigns at their schools. Finally, attendees were provided a menu of options for potential campaign formats, including recommendations to incorporate each of three domains (support, anti-stigma, education), as well as four specified overarching messages capturing key themes, namely, (a) depression is real; (b) professional help is available and effective; (c) depression can take many forms (i.e., has multiple symptoms); and (d) do not keep knowledge about a suicidal peer a secret. After the initial educational training, each P2P student team spent October through December developing a depression awareness campaign tailored to fit their particular school. Schools that had participated in the P2P program previously were encouraged to plan a more focused campaign (according to each school's self-identified needs) that addressed special topics such as depression and sleep, depression and substance abuse, and depression and LGBTQ students. The P2P student proposals were reviewed by the P2P faculty mentors in each school, as well as UMDC staff, and proposals were modified based on the feedback received. Projects were implemented in January of the following year, and P2P teams submitted a final implementation report to the UMDC in May of each school year. In May, P2P teams from each school returned to the UMDC for the Closing Conference during which each P2P student team gave an oral presentation on their campaign. P2P teams also submitted a final implementation report to the UMDC in May.

1.8.3.1 Implementation Tips for Other Settings

1. Training needs to be provided to the student team members to prepare them and develop practical health promotion and depression prevention skills.
2. These students must then create the campaign and be prepared for possible challenges in running the program or any unforeseen modifications that need to be made during implementation.
3. A "train-the-trainer" approach is helpful to use during the initial educational conference in order to prepare students to present information effectively and lead activities that reinforce learning.

1.8.4 What Questionnaires Did We Use for Evaluation?

Under the guidance of the University of Michigan Institute for Social Research (ISR), the existing P2P Depression Awareness Questionnaire was adapted from a

previous version. It includes 14 questions with 44 items. Survey items cover six domains: (a) demographics; (b) helping others with a mental illness (three items); (c) helping yourself (two items); (d) depression knowledge, using a modified Adolescent Depression Knowledge Questionnaire (ADKQ; [80]) comprised of 13 yes/no items; (e) depression help-seeking, involving reporting their formal and informal intentions to seek help from 12 targeted help sources; and (f) school environment and depression stigma, modified from the Revised Attribution Questionnaire (r-AQ; [92]), with 10 items asking about participant response in reference to a new student whom they heard had depression, as well as an item addressing their own comfort in discussing mental health issues with other students. At post-intervention only, there were five additional questions to assess the visibility of each school's P2P campaign (e.g., "During the last school year, did you notice a student group in your school promoting mental health awareness?").

1.8.4.1 Implementation Tips for Other Settings

We chose to conduct a more comprehensive evaluation. For other sites, a brief questionnaire modeled after our questionnaire should be sufficient.

1.8.5 What Were the Outcomes of Our School Intervention?

Prior to the P2P student participant Kickoff Conference in October, all P2P students were asked to complete a baseline questionnaire. The survey consisted of a series of items designed to assess students' knowledge of depression, perceived stigma associated with depression, and awareness of help-seeking behaviors associated with depressive illnesses. Participants were assigned a confidential ID number, and the questionnaire instructions clearly explained the confidential and anonymous nature of the study, as well as the voluntary nature of participation.

Prior to the campaign implementation, convenience samples of non-P2P students from each school were asked to complete the baseline questionnaire at their schools. This questionnaire was identical to the surveys completed by the P2P students prior to the Kickoff Conference. Surveys were provided in hard copy, and the project coordinator entered all data into the project database.

After the Closing Conference in May, all P2P team members were asked to complete the post-intervention questionnaire. This allowed assessment of whether being on a P2P team had any influence on P2P students' depression-related knowledge and attitudes. Similarly, within one week of the Closing Conference, all non-P2P students were asked to complete the post-intervention questionnaire to determine whether the intervention had any influence on non-P2P students' depression-related knowledge and attitudes, stigma reduction, and help-seeking.

1.8.5.1 Implementation Tips for Other Settings

It is important to conduct at least a brief evaluation questionnaire with a pre- and post-intervention comparison in order to understand the areas in which the intervention was effective or ineffective in changing your target outcome(s).

1.8.6   Quantitative Outcomes of Our School Intervention

1.8.6.1 P2P Campaign Components

In the domain of public education, each school created a depression awareness campaign consisting of three to ten components. The average number of activities implemented among eight schools was 5.8 in 2014. The most frequently used activities included school assemblies, displays around school (e.g., bulletin boards, posters, flyers, banners), and giveaways (e.g., pens, wristbands, fortune cookies).

1.8.6.2 Detailed Questionnaire Results

All analyses were conducted with the SPSS software package (SPSS/22.0; [93]) which was used to produce the calculations. Descriptive analyses focus on estimating the overall effects of the P2P program on knowledge, stigma, and awareness of help-seeking behaviors by assessing changes from baseline to post-intervention among P2P team members and non-P2P students. Results are based on baseline and post-intervention pairwise comparisons. Baseline and post-intervention means, standard deviations, and percentages are reported. The alpha level was set at 0.05.

   Table 1.3 displays the overall pre- and post-intervention results for P2P team members and non-P2P students. Under the domain of helping others, all three questions demonstrated statistically significant improvements. Under the domain of helping yourself, one item was statistically significant. Under the knowledge domain, statistically significant improvements were made in two of the five subquestions, and students were more likely to correctly identify depression symptoms from a provided list. In the domain of help-seeking, students showed a statistically significant increase in their likelihood of seeking help for a personal or emotional problem. At post-intervention, students were more likely to consider seeking help from seven out of 12 sources. In the domain of school environment and stigma, three out of ten subquestions were statistically significant. At post-intervention, students were also statistically significantly more comfortable discussing mental health issues with their peers.

1.8.6.3 Did Noticing the P2P Work or Attending P2P Events Influence Results?

Results were also separated out according to whether or not respondents noticed the P2P group promoting mental health awareness in their school and whether or not respondents attended any P2P programs. All non-P2P students were potentially exposed to the general publicity campaign, with 60.4% of respondents stating that they noticed the P2P group and activities and 30.1% of respondents proceeding to attend additional specialized programs.

   Respondents who had either noticed the P2P student group or who had attended any P2P programs were more likely to feel confident helping others and talking about mental health issues. These students were statistically significantly more likely to have reported lower levels of mental illness stigma in their schools and lower mental illness stigma themselves. Moreover, at post-intervention, students

Table 1.3 P2P Depression awareness questionnaire baseline and post-intervention results[a]

	Baseline		Post-intervention		t	df
	M	SD	M	SD		
Helping others						
How confident are you in your ability to identify someone who is showing the common signs of depression?[b]	4.45	1.45	4.93	1.37	−7.48*	519
How confident are you in your ability to help a friend access mental health support services in your school or in the community?[b]	4.40	1.56	5.06	1.45	−9.66*	518
	Baseline (%) "tell someone"		N	Post-intervention (%) "tell someone"		N
If your friend tells you that he/she is thinking about suicide and asks you to keep it a secret because no one else knows, what do you do?	88.0*		448	94.2*		478
	Baseline (%) "yes"		N	Post-intervention (%) "yes"		N
Helping yourself						
If you had symptoms of depression that lasted for more than 2 weeks, would you ask for help?	66.5*		339	74.0*		379
	Baseline		Post-intervention		t	df
	M	SD	M	SD		
If you were seen going into the office of your school social worker or school psychologist, how would you feel?[c]	3.06	1.67	2.92	1.64	1.94	515
Indicate, to the best of your knowledge, whether each statement is true or false	Baseline (%) correct		N	Post-intervention (%) correct		N
Knowledge about depression						
Depression runs in some families	80.8		408	84.6		427
Depression can be controlled through willpower	62.8*		316	72.0*		362
Depression is a treatable health condition	90.9		459	94.0*		477
The abuse of alcohol and drugs can be a sign of depression	95.0		480	96.6		488
Depression is a sign of personal weakness	83.9		422	86.1		433
Which of the items below could be symptoms of depression if they continue for more than 2 weeks? Check all that apply	Baseline (%) correct			Post-intervention (%) correct		
Difficulty concentrating or making decisions	76.0*		385	87.4*		443
Feeling angry	74.0*		375	81.3*		412

(continued)

Table 1.3 (continued)

	Baseline		Post-intervention			
	M	SD	M	SD	t	df
Changes in sleep patterns	87.5*	442	95.4*	482		
Frequent, unexplained aches and pains	43.2*	219	62.3*	316		
Feeling tired or less energetic	92.1*	467	96.3*	488		
Eating more than usual	64.7*	328	83.6*	424		
Feeling irritable or restless	86.8*	439	90.5*	458		

	Average correct baseline	Average correct post-intervention
Number of depression symptoms circled correctly from a list (max 7)	5.23*	5.96*

Imagine that you recently heard about a new student at your school who has depression. To what extent do you agree or disagree with the following statements?[d]	Baseline		Post-intervention		t	df
	M	SD	M	SD		

School environment and stigma

	M	SD	M	SD	t	df
The new student is more dangerous than other students	2.04	0.96	1.88	0.96	3.65*	508
The student is to blame for his or her condition	1.60	0.84	1.55	0.80	1.29	508
I would have sympathy for the new student	3.98	0.85	3.84	0.86	3.28*	508
The new student makes me feel scared	1.66	0.83	1.67	0.84	−0.31	508
The new student makes me uncomfortable	1.84	0.97	1.86	0.92	−0.49	508
I would help the new student even if I did not know him or her well	3.72	0.94	3.64	0.96	1.87	509
I would try to stay away from the new student	1.80	0.83	1.80	0.92	0.00	508
The new student would be made fun of at my school	2.33	1.01	2.31	1.01	0.55	508
The new student would be ignored at my school	2.64	1.03	2.58	1.03	1.22	509
I think other students in my school would try to help the new student	3.29	0.98	3.44	0.95	−3.41*	507

	Baseline		Post-intervention		t	df
	M	SD	M	SD		
How comfortable are you discussing mental health issues (e.g., depression and anxiety) with your peers?[e]	4.57	1.69	4.87	1.60	−4.49*	505

Help-seeking

If you were having a personal or emotional problem, how likely is it that you would seek help from the following people?[f]	Baseline		Post-intervention		t	df
	M	SD	M	SD		
Friend	3.12	0.89	3.19	0.82	−1.94	507
Parent/guardian	2.86	1.05	2.93	1.04	−1.95	505

(continued)

Table 1.3 (continued)

	Baseline		Post-intervention				df
	M	SD	M	SD	t		
School counselor		2.17	0.97	2.37	0.10	−5.08*	506
Teacher		1.99	0.91	2.18	0.93	−5.21*	506
Mental health professional		2.79	0.10	2.95	0.95	−3.80*	504
Doctor		2.74	1.00	2.89	0.95	−3.28*	504
Internet website		2.33	1.08	2.38	1.11	−1.15	505
Clergy		1.68	0.93	1.77	0.97	−2.46*	504
Phone help line		1.51	0.75	1.73	0.88	−5.87*	506
Other relative		2.55	1.10	2.59	1.02	−0.83	502
Boyfriend or girlfriend		2.71	1.05	2.77	1.03	−1.30	502
Coach		1.86	1.01	1.99	1.01	−3.21*	503

*Significant at 5% probability level
[a]Results based on baseline/post-intervention pairwise comparisons ($p \leq 0.05$)
[b]Scores range from 1 to 7 with higher scores indicating greater confidence
[c]Scores range from 1 to 7 with higher scores indicating greater embarrassment
[d]Scores range from 1 to 5 with higher scores indicating greater agreement
[e]Scores range from 1 to 7 with higher scores indicating greater comfort
[f]Scores range from 1 to 4 with higher scores indicating greater likelihood

who reportedly noticed or attended a P2P program were more likely to seek help from five out of ten sources than at baseline.

1.8.6.4 Implementation Tips for Other Settings

For research purposes, it was useful to analyze separately whether being a student team member influenced students' outcomes as well as to compare whether noticing the intervention or attending a program-sponsored event influenced the overall outcome results. However, for most sites looking at pre-/post-changes, it is sufficient to simply evaluate changes in the entire group.

1.8.7 What Kind of Feedback Did We Receive on the School Intervention?

While the major thrust of evaluation was on questionnaires, qualitative remarks were also collected. Qualitative feedback from P2P members included 11 comments, seven of which reiterated that the P2P program increased their knowledge about depression. Specifically, one P2P student said, "Throughout all of this I learned so much more about depression and it helped me get help for my own depression." One parent commented that after a P2P depression awareness month at school, her child was able to identify depression symptoms in his brother and encourage him to seek help. Seven teachers/mentors also commented on the P2P program, with the majority discussing the openness and engagement of the students

in relation to the P2P program. For instance, one P2P mentor noted that students were engaged and "enjoyed that peers did the performance because it made it more relatable." A teacher said, "I'm so glad to see such a concerted effort to raise awareness about mental health issues."

The P2P intervention results in greater awareness and earlier detection of depressive disorders among adolescents. This in turn may translate to lower levels of depression-related academic problems, social difficulties, substance use, other psychiatric disorders, and suicide.

1.8.7.1 Implementation Tips for Other Settings

It is important to collect feedback through questionnaires and perhaps conduct a focus group to acquire a different perspective on the effects of this intervention and capture subtleties that can be missed through quantitative methods alone. In addition, the qualitative remarks serve as key summaries of the benefit of the intervention, and for the public and policy-makers, the ability to quote a statement is often more effective than quoting statistics in conveying the benefit of the intervention. The participants' comments are a form of "story-telling," and even in scientific conferences, "telling a story" about a study or intervention is considered the most effective way to convey results.

1.8.8   Expansion of the P2P Program

We are currently in the process of developing systematic methodology to replicate the P2P program in other regions and to expand the program to middle schools. Specifically, we will be expanding the P2P program to three other counties next year covering urban, rural, and remote locations and then across multiple states in the United States (we have satellite programs in two other states currently), with an explicit dissemination strategy and budget. We are also promoting access to program consultation and ongoing support through the development of a P2P Guidelines Manual and web-based didactic P2P resources.

1.8.8.1 Implementation Tips for Other Settings

If possible, expanding the reach of the program to additional geographic locations and educational stages will enable more students and communities to benefit from the program's curriculum. This can be done after successful implementation in one school district and then careful, step-by-step cultivation of partners in other districts.

1.9   SPARX-R and the Use of Digital Technologies

The key challenges to successful prevention activities are population reach and engagement. One strategy to overcome access to potentially useful prevention programs and to reach more young people is via digital technologies. Smartphone

technology, the Internet of Things, and social media have been likened to a revolution similar to the printing press [94]. In comparison with the 15 years it took for the PC, and seven years for the web, it took only two years for a quarter of people to use a smartphone: 77% of Australians currently own an application (app)-capable smartphone, and nearly all (95%) of those aged 18–34 own one [95]. Young people are much more likely to use the Internet for banking, communication, social networking, and shopping, and almost a third now exclusively use mobile devices for these reasons [96]. This revolution is occurring across the world, even in the most remote areas. Technologies such as the smartphone and the Internet offer huge opportunities to deliver at scale and directly into the hands of these young people. In Australia for example, we have just demonstrated the use of an app for suicide prevention that reduces depression [97]. Technologies also offer the opportunity for engagement, and games or interactive games can provide opportunities for young people to learn about techniques such as cognitive behavior therapy (CBT).

In the last few years, the Black Dog Institute has partnered with Sally Merry and her team in Auckland to adapt her treatment program SPARX [87] to develop a prevention program. We have previously demonstrated the effectiveness of digital technologies for prevention using MoodGYM [49]. However, we were interested in whether the timing of these interventions could achieve better results if prevention occurred prior to a major stressor and if more contemporary interactions using serious games would improve engagement.

The SPARX-R trial commenced in 2014. SPARX-R is an online, gamified universal depression prevention intervention based on cognitive behavioral principles delivered to school students in advance of a specific, significant stressor. The SPARX-R introduction informs participants that "This version of SPARX was made to help young people who are having hassles and feeling down, stressed or angry a lot of the time. Even if you are doing fine, SPARX-R can help strengthen your skills for dealing with problems when they do come along." Participants personalize an avatar and navigate through a series of challenges and obstacles within a fantasy world that has been overrun by gloomy, negative, automatic thoughts. The student's mission is to restore balance in the game world. The program has seven modules (levels), each of which takes approximately 20–30 minutes to complete. For further details on the project, please see the published research protocol [61]. The rationale was that rates of depression begin to increase at 12–13 years of age, but the growth in incidence is continuous, with new cases of depression emerging at a similar rate throughout adolescence. In determining the point at which a preventive intervention might be optimally delivered, it is notable that stressful life events act as predictors and candidate causal factors in the development of depression. Final examinations represent a significant stressor for most adolescents. More specifically, in cultures where significant emphasis is placed on university entrance examinations in the final year of school, students tend to spend much more time doing schoolwork and less time in discretionary activities and to have more negative affective states across daily activities and higher rates of depression, relative to cultures without this focus on examinations.

This study was a cluster-randomized controlled superiority trial with two parallel arms, consisting of an experimental condition and an attention-matched control condition in ten schools. We adopted an adaptive design, such that accumulating data will be used to decide if or how to modify the study as it continues. To facilitate this design and to stagger recruitment, the trial took place in two stages across consecutive years, with each stage designed to begin at the start of the academic calendar (February 2015 and February 2016). The intervention phase lasted five weeks with a follow-up period of 18 months. Results from the 2015 cohort were subject to an interim analysis to determine preliminary effects and to determine whether any modifications would be required in the conduct of the trial in 2016. The findings were significant, so the second recruitment period was not commenced. The findings of the study clearly demonstrated that we were able to reduce depression, a result that continued for six months but was not present at 18 months (results in submission).

However, effectiveness is not sufficient to ensure implementation, and the lessons learned from this trial suggest that more work is required, much of which we have now instigated.

- Technical problems associated with SPARX both internally and in its use in sometimes poorly Internet-based environments need to be resolved before any licensing agreements or rollout to control schools occurs.
- Very few parents were interested in completing questionnaires about the mental health of their children.
- Qualitative and focus group data from staff ($n = 14$) from government, selective, secondary schools in inner Sydney showed that the majority of school staff (57.1%) reported that they were comfortable using computer/online programs; however others also felt uncomfortable (42.9%). When asked about a specific stand-alone online mental health program (SPARX), the majority of respondents liked the look and style of it (92.8%), while no one reported they did not like it. Importantly, all participants reported they liked the messages and information in the program, and all were willing to use SPARX in their school.
- Qualitative and focus group data from students were provided by 15 students from two government, selective, secondary schools in inner Sydney, aged between 15–17 years, with a roughly equal spread across gender (53.3% male). Of these, 33% reported they have felt low for a two-week period at some point in their life. In regard to the online program (SPARX) showed to the students, 73.4% reported that they liked the look and feel, and 86.7% reported they liked the messages/information of SPARX, while no one reported that they did not like these aspects. 53.4% said they would be willing to use SPARX if they were feeling depressed, and 40% were willing to use it to prevent them from becoming depressed.

A more formal implementation plan will commence in 2017 conducted by Dr. Aliza Werner-Seidler at the Black Dog Institute. The goal of this project is to investigate optimal implementation strategies to support the rollout of SPARX-R in the school context. Despite major advances in the availability of effective mental health

programs such as SPARX-R, there is a serious shortfall in the translation and delivery of such programs in practice. This project is comprised of two phases. Phase 1 involves a qualitative investigation into the barriers and facilitators to implementing SPARX-R in schools. Based on anecdotal evidence from our RCT, it is likely that aligning SPARX-R with educational curriculum outcomes will address at least one of the key barriers faced by schools. However, this has not yet been systematically addressed, as research on this topic is scarce [98]. Phase 2 involves the development of an implementation plan as determined by key themes emerging from Phase 1. The implementation strategies identified will then be tested in a randomized implementation trial comparing two key strategies (these might include delivery of educational resources to schools, teacher training with accreditation for continued professional development, and aligning content to the standard curriculum). Primary outcomes will be program uptake and completion rates. The endpoint will be an evidence-based implementation strategy that is acceptable to schools, which will inform the large-scale rollout of this program across Australia.

1.10 Translation of Models to Low- and Middle-Income Countries

We have identified two strategies that both rely on school-based interventions as the most appropriate and likely cost-effective method for easy access to adolescents. These two programs offer different approaches, one very "participatory," involving cultivating students themselves as the backbone of the intervention, and the other involving use of Internet-based and app-based interventions. These approaches therefore offer choices for application to other regions of the world; for some developing countries, Internet access and smartphone uptake may be excellent and growing. For other countries, the cultural tradition of engaging students may be strong and so lend support to the implementation of student-led approaches. Both approaches might be needed to promote and engage young people and offer a range of interventions, not just for depression but also for other risk areas such as drug and alcohol, suicide, and eating disorders. For example, the most recent review reports rapid uptake of technology and smartphone use in developing economies. Smartphone ownership is rapidly climbing from a median of 21% in 2013 to 37% in 2015 [99]. Unsurprisingly, the rates are much higher in the younger age groups.

1.11 Limitations in the Field

Despite advancements in the field of depression prevention and the growing number of studies focused on depression prevention programs delivered in schools, most of these interventions are built around delivery by health professionals, a major limitation in the field. Programs led and implemented by health professionals give students and school personnel little buy-in or feelings of ownership over the program. When an intervention program is constructively co-created and implemented by

students, school personnel, and health professionals, it is more likely to be adopted, institutionalized within the school, and sustained as a program. More broad limitations to the idea of school-based interventions must be acknowledged, such as the reality that some youth do not attend school or would benefit more from external mental health services. Furthermore, in considering the results from research studies, overall effect sizes in extant school-based depression intervention research have been small [38, 46, 47], as would be expected for prevention rather than treatment interventions.

1.12   Recommendations for Immediate Implementation

In order to ensure the most cost- and time-efficient service delivery, prevention programs should capitalize on the resources already available in each school. For instance, programs can be integrated into the school curriculum with teachers or other school personnel trained in prevention and supported by ongoing consultation to deliver these programs (e.g., [40, 89]). In addition, based on our results from implementing the University of Michigan P2P program, depression intervention programs can successfully enlist youth as valuable mental health advocates and peer educators. These methods may in turn strengthen relationships between teachers, students, and parents and create a healthier school environment overall. Importantly, however, the youth need resources, mentorship, and concrete platforms for engagement and participation, which may be less available in certain settings [27]. Furthermore, whenever possible, prevention programs should be designed to be flexible and should be tailored to individual communities and student populations. For instance, low-income youth, minority youth, or youth from rural communities may have specialized mental health needs that should be incorporated into program content. However, few studies have specifically focused on these populations of youth (e.g., [13, 41]), even though they may be particularly vulnerable to depression [50]. Lastly, when developing and implementing programs, researchers and clinicians should make use of existing data to better understand what makes interventions most and least effective.

1.13   Future Directions for Research and Implementation

Moving forward, large-scale effectiveness trials are needed to identify best practices for implementing school-based depression prevention and education programs. Successful randomized controlled trials (RCTs) must be replicated, and, whenever possible, researchers should follow participants over longer periods of time so longer-term effects can be detected.

A simple approach to conducting such trials involves randomizing some schools to receive the intervention, and others to serve as a control, and then the following year having the control schools receive the intervention. This wait-list control design allows randomization but also enables schools to know that they will

eventually receive the intervention. A more sophisticated approach might include cluster randomization, participant preference arms, and action research.

Cost-effective measures, encompassing both direct and indirect costs, need to be prioritized in future trials in order to demonstrate that the program provides good value and implementation is a good investment. Moreover, greater attention to mediator and moderator variables within the field will guide theory-driven program evaluation and lend insight into the validity of intervention programs. To date, most depression intervention RCTs have primarily focused on clinical treatments such as CBT that is delivered in person. However, it is worth looking into additional educational interventions as well as online and mobile interventions.

Additionally, the vast majority of depression prevention trials are from HICs that are English-speaking (although this observation may partly be due to our specified inclusion and exclusion criteria). At present, the availability of prevention programs is unevenly distributed around the world. Expanding the reach and availability of prevention programs will provide more countries and communities with a gamut of preventive tools and resources to reduce the impact of mental disorders. Additional depression prevention programs need to be systematically adapted to economically and socially marginalized adolescent and young adult populations, such as refugees, LGBTQ youth, and minorities, as well as among different regional, cultural, and ethnic groups. Some existing examples in the e-health world include Little Prince is Depressed, an interactive tour of depression information from Hong Kong [100], and the Chinese MoodGYM Project [101], an interactive program based on cognitive behavior therapy, though these programs are not school-based. Successful programs should also be conducted in more languages to reach youth worldwide (e.g., [102]). One way to make evidence-based prevention programs widely available is to create a database with detailed program and program implementation information. In addition, access to program consultation and ongoing support through the development of official guidelines and online resources should be made available to mental health researchers worldwide. Moreover, given the early onset of depression [3], it is important to implement more interventions that begin in primary school. Lastly, in order for interventions to achieve the greatest impact globally, depression prevention and mental health promotion need to be included in national and international legislation and policy measures.

Conclusions

School-based depression education and prevention interventions may reduce the risk of poor mental health outcomes in children and adolescents in LMICs and HICs as well as the incidence, duration, and costs of depression [15, 44, 103]. Though effect sizes are small, findings from universal and selective school-based interventions for depression education and prevention suggest the feasibility and scalability of these interventions [37, 38, 46, 47]. In order to improve the success of future research initiatives and ensure positive mental health outcomes, the field now needs to refine program implementation and identify best practices for implementation based on lessons learned from exist-

ing programs. This will hopefully result in more effective, practical, and flexible programs that lead to lower levels of depression-related academic problems, difficulties with friends and family members, substance use, other psychiatric disorders, and suicide.

References

1. Gore FM, Bloem PJ, Patton GC, Ferguson J, Joseph V, Coffey C, et al. Global burden of disease in young people aged 10–24 years: a systematic analysis. Lancet. 2011;377(9783):2093–102.
2. Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, et al. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). JAMA. 2003;289(23):3095–105.
3. Avenevoli S, Swendsen J, He J-P, Burstein M, Merikangas KR. Major depression in the national comorbidity survey-adolescent supplement: prevalence, correlates, and treatment. J Am Acad Child Adolesc Psychiatry. 2015;54(1):37–44.e2.
4. Forman-Hoffman V, McClure E, McKeeman J, Wood CT, Middleton JC, Skinner AC, et al. Screening for major depressive disorder in children and adolescents: a systematic review for the U.S. Preventive Services Task Force. Screening for MDD in children and adolescents. Ann Intern Med. 2016;164(5):342–9.
5. Siu AL. Screening for depression in children and adolescents: US Preventive Services Task Force Recommendation Statement. Pediatrics. 2016;137:e20154467.
6. Crum RM, Storr CL, Ialongo N, Anthony JC. Is depressed mood in childhood associated with an increased risk for initiation of alcohol use during early adolescence? Addict Behav. 2008;33(1):24–40.
7. Chaiton MO, Cohen JE, O'Loughlin J, Rehm J. A systematic review of longitudinal studies on the association between depression and smoking in adolescents. BMC Public Health. 2009;9:356.
8. Volkow ND. The reality of comorbidity: depression and drug abuse. Biol Psychiatry. 2004;56(10):714–7.
9. Verboom CE, Sijtsema JJ, Verhulst FC, Penninx BWJH, Ormel J. Longitudinal associations between depressive problems, academic performance, and social functioning in adolescent boys and girls. Dev Psychol. 2014;50(1):247–57.
10. Cuijpers P, van Straten A, Smit F, Mihalopoulos C, Beekman A. Preventing the onset of depressive disorders: a meta-analytic review of psychological interventions. Am J Psychiatry. 2008;165(10):1272–80.
11. Smit F, Willemse G, Koopmanschap M, Onrust S, Cuijpers P, Beekman A. Cost-effectiveness of preventing depression in primary care patients: randomised trial. Br J Psychiatry J Ment Sci. 2006;188:330–6.
12. Muñoz RF, Cuijpers P, Smit F, Barrera AZ, Leykin Y. Prevention of major depression. Annu Rev Clin Psychol. 2010;6:181–212.
13. Tylee A, Haller DM, Graham T, Churchill R, Sanci LA. Youth-friendly primary-care services: how are we doing and what more needs to be done? Lancet. 2007;369(9572):1565–73.
14. Patel V, Kieling C, Maulik PK, Divan G. Improving access to care for children with mental disorders: a global perspective. Arch Dis Child. 2013;98(5):323–7.
15. Fazel M, Patel V, Thomas S, Tol W. Mental health interventions in schools in low-income and middle-income countries. Lancet Psychiatry. 2014;1(5):388–98.
16. Gulliver A, Griffiths KM, Christensen H. Perceived barriers and facilitators to mental health help-seeking in young people: a systematic review. BMC Psychiatry. 2010;10(1):113. Available from: http://bmcpsychiatry.biomedcentral.com/articles/10.1186/1471-244X-10-113
17. Murman NM, Buckingham KCE. Let's erase the stigma (LETS): a quasi-experimental evaluation of adolescent-led school groups intended to reduce mental illness stigma. Child Youth Care Forum. 2014;43(5):621–37.

18. Evans-Lacko S, Brohan E, Mojtabai R, Thornicroft G. Association between public views of mental illness and self-stigma among individuals with mental illness in 14 European countries. Psychol Med. 2012;42(8):1741–52.

19. Calear AL, Griffiths KM, Christensen H. Personal and perceived depression stigma in Australian adolescents: magnitude and predictors. J Affect Disord. 2011;129(1-3):104–8.

20. Barrett PM, Pahl KM. School-based intervention : examining a universal approach to anxiety management. Aust J Guid Couns. 2006;16(1):55–75.

21. Masia-Warner C, Nangle D, Hansen D. Bringing evidence-based child mental health services to the schools: general issues and specific populations. Fac Publ Dep Psychol. 2006;29(2):165. Available from: http://digitalcommons.unl.edu/psychfacpub/71

22. Pike K, Susser E, Galea S, Pincus H. Towards a healthier 2020: advancing mental health as a global health priority. Public Health Rev. 2013;35(1):7.

23. Collins PY, Patel V, Joestl SS, March D, Insel TR, Daar AS. Grand challenges in global mental health. Nature. 2011;475(7354):27–30.

24. World Health Organization (WHO). Mental health action plan 2013 - 2020 [Internet]. World Health Organization; 2013 [cited 2016 Jun 9]. Available from: http://www.who.int/entity/mental_health/publications/action_plan/en/index.html

25. Office of the Surgeon General (US), National Action Alliance for Suicide Prevention (US). National strategy for suicide prevention: goals and objectives for action: a report of the U.S. Surgeon General and of the National Action Alliance for Suicide Prevention [Internet]. Washington, DC: US Department of Health & Human Services (US); 2012 [cited 2016 Sep 22]. (Publications and Reports of the Surgeon General). Available from: http://www.ncbi.nlm.nih.gov/books/NBK109917/

26. National Research Council (US) and Institute of Medicine (US) Committee on the Prevention of Mental Disorders and Substance Abuse Among Children, Youth, and Young Adults: Research Advances and Promising Interventions. Preventing Mental, Emotional, and Behavioral Disorders Among Young People: Progress and Possibilities [Internet]. O'Connell ME, Boat T, Warner KE, editors. Washington, DC: National Academies Press (US); 2009 [cited 2017 Feb 14]. (The National Academies Collection: Reports funded by National Institutes of Health). Available from: http://www.ncbi.nlm.nih.gov/books/NBK32775/

27. Patton GC, Sawyer SM, Santelli JS, Ross DA, Afifi R, Allen NB, et al. Our future: a Lancet commission on adolescent health and wellbeing. Lancet. 2016;387(10036):2423–78.

28. Mrazek PJ, Haggerty RJ. Reducing risks for mental disorders: frontiers for preventive intervention research. Washington, DC: National Academy Press; 1994.

29. World Health Organization. Prevention of mental disorders: effective interventions and policy options: summary report. 2004 [cited 2017 Jan 8]; Available from: http://www.who.int/iris/handle/10665/43027

30. Catalano RF, Hawkins JD, Berglund ML, Pollard JA, Arthur MW. Prevention science and positive youth development: competitive or cooperative frameworks? J Adolesc Health. 2002;31(6 Suppl):230–9.

31. Britner PA, Randall KG. Mentoring during childhood. In: Gullotta TP, Bloom M, editors. Encyclopedia of primary prevention and health promotion. Boston: Springer; 2014. p. 769–76. Available from: http://link.springer.com/referenceworkentry/10.1007/978-1-4614-5999-6_105.

32. Masten AS, Coatsworth JD, Neemann J, Gest SD, Tellegen A, Garmezy N. The structure and coherence of competence from childhood through adolescence. Child Dev. 1995;66(6):1635–59.

33. Masten AS, Roisman GI, Long JD, Burt KB, Obradovic J, Riley JR, et al. Developmental cascades: linking academic achievement and externalizing and internalizing symptoms over 20 years. Dev Psychol. 2005;41(5):733–46.

34. Neil AL, Christensen H. Efficacy and effectiveness of school-based prevention and early intervention programs for anxiety. Clin Psychol Rev. 2009;29(3):208–15.

35. Stockings EA, Degenhardt L, Dobbins T, Lee YY, Erskine HE, Whiteford HA, et al. Preventing depression and anxiety in young people: a review of the joint efficacy of universal, selective and indicated prevention. Psychol Med. 2016;46(1):11–26.

36. Merry SN, Hetrick SE, Cox GR, Brudevold-Iversen T, Bir JJ, McDowell H. Psychological and educational interventions for preventing depression in children and adolescents. Cochrane Database Syst Rev. 2011. https://doi.org/10.1002/14651858.CD003380.pub3.

37. Werner-Seidler A, Perry Y, Calear AL, Newby JM, Christensen H. School-based depression and anxiety prevention programs for young people: a systematic review and meta-analysis. Clin Psychol Rev. 2016;51:30–47.

38. Brunwasser SM, Garber J. Programs for the prevention of youth depression: evaluation of efficacy, effectiveness, and readiness for dissemination. J Clin Child Adolesc Psychol. 2016;45(6):763–83.

39. Calear AL, Christensen H. Systematic review of school-based prevention and early intervention programs for depression. J Adolesc. 2010;33(3):429–38.

40. Reivich K, Gillham JE, Chaplin TM, Seligman MEP. From helplessness to optimism: the role of resilience in treating and preventing depression in youth. In: Goldstein S, Brooks RB, editors. Handbook of resilience in children. New York: Springer; 2013. p. 201–14. [cited 2016 Dec 28]. Available from: http://link.springer.com/chapter/10.1007/978-1-4614-3661-4_12.

41. Kindt KCM, Kleinjan M, Janssens JMAM, Scholte RHJ. Evaluation of a school-based depression prevention program among adolescents from low-income areas: a randomized controlled effectiveness trial. Int J Environ Res Public Health. 2014;11(5):5273–93.

42. Tomyn JD, Fuller-Tyszkiewicz M, Richardson B, Colla L. A comprehensive evaluation of a universal school-based depression prevention program for adolescents. J Abnorm Child Psychol. 2016;44(8):1621.

43. Horowitz JL, Garber J, Ciesla JA, Young JF, Mufson L. Prevention of depressive symptoms in adolescents: a randomized trial of cognitive-behavioral and interpersonal prevention programs. J Consult Clin Psychol. 2007;75(5):693–706.

44. Fazel M, Hoagwood K, Stephan S, Ford T. Mental health interventions in schools in high-income countries. Lancet Psychiatry. 2014;1(5):377–87.

45. Gladstone TRG, Beardslee WR, O'Connor EE. The prevention of adolescent depression. Psychiatr Clin N Am. 2011;34(1):35–52.

46. Corrieri S, Heider D, Conrad I, Blume A, Konig H-H, Riedel-Heller SG. School-based prevention programs for depression and anxiety in adolescence: a systematic review. Health Promot Int. 2014;29(3):427–41.

47. Wei Y, Hayden JA, Kutcher S, Zygmunt A, McGrath P. The effectiveness of school mental health literacy programs to address knowledge, attitudes and help seeking among youth. Early Interv Psychiatry. 2013;7(2):109–21.

48. Arnarson EO, Craighead WE. Prevention of depression among Icelandic adolescents: a 12-month follow-up. Behav Res Ther. 2011;49(3):170–4.

49. Calear AL, Christensen H, Mackinnon A, Griffiths KM, O'Kearney R. The YouthMood Project: a cluster randomized controlled trial of an online cognitive behavioral program with adolescents. J Consult Clin Psychol. 2009;77(6):1021–32.

50. Cardemil EV, Reivich KJ, Beevers CG, Seligman MEP, James J. The prevention of depressive symptoms in low-income, minority children: two-year follow-up. Behav Res Ther. 2007;45(2):313–27.

51. Chaplin TM, Gillham JE, Reivich K, Elkon AGL, Samuels B, Freres DR, et al. Depression prevention for early adolescent girls: a pilot study of all girls versus co-ed groups. J Early Adolesc. 2006;26(1):110–26.

52. Cutuli JJ, Chaplin TM, Gillham JE, Reivich KJ, Seligman MEP. Preventing co-occurring depression symptoms in adolescents with conduct problems: the Penn Resiliency Program. Ann N Y Acad Sci. 2006;1094:282–6.

53. Garber J, Clarke GN, Weersing VR, Beardslee WR, Brent DA, Gladstone TRG, et al. Prevention of depression in at-risk adolescents: a randomized controlled trial. JAMA. 2009;301(21):2215–24.

54. Gillham JE, Reivich KJ, Freres DR, Chaplin TM, Shatté AJ, Samuels B, et al. School-based prevention of depressive symptoms: a randomized controlled study of the effectiveness and specificity of the Penn Resiliency Program. J Consult Clin Psychol. 2007;75(1):9–19.

55. Gillham JE, Reivich KJ, Brunwasser SM, Freres DR, Chajon ND, Kash-Macdonald VM, et al. Evaluation of a group cognitive-behavioral depression prevention program for young adolescents: a randomized effectiveness trial. J Clin Child Adolesc Psychol. 2012;41(5):621–39.

56. Johnstone J, Rooney RM, Hassan S, Kane RT. Prevention of depression and anxiety symptoms in adolescents: 42 and 54 months follow-up of the Aussie Optimism Program-Positive Thinking Skills. Front Psychol. 2014;5:364. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4036073/

57. Lowry-Webster HM, Barrett PM, Lock S. A universal prevention trial of anxiety symptomology during childhood: results at 1-year follow-up. Behav Chang. 2003;20(1):25–43.

58. Manz R, Junge J, Neumer S, Margraf J. Primary prevention of anxious and depressive symptoms in adolescents. J Public Health. 2001;9(3):229.

59. Merry S, McDowell H, Wild CJ, Bir J, Cunliffe R. A randomized placebo-controlled trial of a school-based depression prevention program. J Am Acad Child Adolesc Psychiatry. 2004;43(5):538–47.

60. Pattison C, Lynd-Stevenson RM. The prevention of depressive symptoms in children: the immediate and long-term outcomes of a school-based program. Behav Chang. 2001;18(2):92–102.

61. Perry Y, Calear AL, Mackinnon A, Batterham PJ, Licinio J, King C, et al. Trial for the Prevention of Depression (TriPoD) in final-year secondary students: study protocol for a cluster randomised controlled trial. Trials. 2015;16:451.

62. Pössel P, Horn AB, Groen G, Hautzinger M. School-based prevention of depressive symptoms in adolescents: a 6-month follow-up. J Am Acad Child Adolesc Psychiatry. 2004;43(8):1003–10.

63. Pössel P, Adelson JL, Hautzinger M. A randomized trial to evaluate the course of effects of a program to prevent adolescent depressive symptoms over 12 months. Behav Res Ther. 2011;49(12):838–51.

64. Pössel P, Martin NC, Garber J, Hautzinger M. A randomized controlled trial of a cognitive-behavioral program for the prevention of depression in adolescents compared with nonspecific and no-intervention control conditions. J Couns Psychol. 2013;60(3):432–8.

65. Quayle D, Dziurawiec S, Roberts C, Kane R, Ebsworthy G. The effect of an optimism and lifeskills program on depressive symptoms in preadolescence. Behav Chang. 2001;18(4):194–203.

66. Raes F, Griffith JW, Van der Gucht K, Williams JMG. School-based prevention and reduction of depression in adolescents: a cluster-randomized controlled trial of a mindfulness group program. Mindfulness. 2014;5(5):477–86.

67. Rivet-Duval E, Heriot S, Hunt C. Preventing adolescent depression in mauritius: a universal school-based program. Child Adolesc Mental Health. 2011;16(2):86–91.

68. Roberts C, Kane R, Thomson H, Bishop B, Hart B. The prevention of depressive symptoms in rural school children: a randomized controlled trial. J Consult Clin Psychol. 2003;71(3):622–8.

69. Roberts CM, Kane R, Bishop B, Cross D, Fenton J, Hart B. The prevention of anxiety and depression in children from disadvantaged schools. Behav Res Ther. 2010;48(1):68–73.

70. Rooney R, Roberts C, Kane R, Pike L, Winsor A, White J, et al. The prevention of depression in 8- to 9-year-old children: a pilot study. J Psychol Couns Sch. 2006;16(1):76–90.

71. Rose K, Hawes DJ, Hunt CJ. Randomized controlled trial of a friendship skills intervention on adolescent depressive symptoms. J Consult Clin Psychol. 2014;82(3):510–20.

72. Sawyer MG, Pfeiffer S, Spence SH, Bond L, Graetz B, Kay D, et al. School-based prevention of depression: a randomised controlled study of the beyondblue schools research initiative. J Child Psychol Psychiatry. 2010;51(2):199–209.

73. Sheffield JK, Spence SH, Rapee RM, Kowalenko N, Wignall A, Davis A, et al. Evaluation of universal, indicated, and combined cognitive-behavioral approaches to the prevention of depression among adolescents. J Consult Clin Psychol. 2006;74(1):66–79.

74. Shochet IM, Dadds MR, Holland D, Whitefield K, Harnett PH, Osgarby SM. The efficacy of a universal school-based program to prevent adolescent depression. J Clin Child Adolesc Psychol. 2001;30(3):303–15.

75. Stallard P, Sayal K, Phillips R, Taylor JA, Spears M, Anderson R, et al. Classroom based cognitive behavioural therapy in reducing symptoms of depression in high risk adolescents: pragmatic cluster randomised controlled trial. BMJ. 2012;345:e6058.
76. Spence SH, Sheffield JK, Donovan CL. Long-term outcome of a school-based, universal approach to prevention of depression in adolescents. J Consult Clin Psychol. 2005;73(1):160–7.
77. Tak YR, Lichtwarck-Aschoff A, Gillham JE, Van Zundert RMP, Engels RCME. Universal school-based depression prevention "Op Volle Kracht": a longitudinal cluster randomized controlled trial. J Abnorm Child Psychol. 2016;44:949.
78. Wahl MS, Adelson JL, Patak MA, Pössel P, Hautzinger M. Teachers or psychologists: who should facilitate depression prevention programs in schools? Int J Environ Res Public Health. 2014;11(5):5294–316.
79. Wong N, Kady L, Mewton L, Sunderland M, Andrews G. Preventing anxiety and depression in adolescents: a randomised controlled trial of two school based Internet-delivered cognitive behavioural therapy programmes. Internet Interv. 2014;1(2):90–4.
80. Barrett PM, Farrell LJ, Ollendick TH, Dadds M. Long-term outcomes of an Australian universal prevention trial of anxiety and depression symptoms in children and youth: an evaluation of the friends program. J Clin Child Adolesc Psychol. 2006;35(3):403–11.
81. Schilling EA, Aseltine RH, James A. The SOS suicide prevention program: further evidence of efficacy and effectiveness. Prev Sci. 2016;17(2):157–66.
82. Swartz KL, Kastelic EA, Hess SG, Cox TS, Gonzales LC, Mink SP, et al. The effectiveness of a school-based adolescent depression education program. Health Educ Behav. 2010;37:11.
83. Parikh SV, Taubman DS, Antoun C, Ewell Foster C, Grambeau M, Hunter J, et al. The Michigan peer-to-peer depression awareness campaign: school-based prevention to address depression among teens. Psychiatr Serv (in press).
84. Hess SG, Cox TS, Gonzales LC, Kastelic EA, Mink SP, Rose LE, et al. A survey of adolescents' knowledge about depression. Arch Psychiatr Nurs. 2004;18(6):228–34.
85. Ruble AE, Leon PJ, Gilley-Hensley L, Hess SG, Swartz KL. Depression knowledge in high school students: effectiveness of the adolescent depression awareness program. J Affect Disord. 2013;150(3):1025–30.
86. Nation M, Crusto C, Wandersman A, Kumpfer KL, Seybolt D, Morrissey-Kane E, et al. What works in prevention. Principles of effective prevention programs. Am Psychol. 2003;58(6-7):449–56.
87. Merry SN, Stasiak K, Shepherd M, Frampton C, Fleming T, Lucassen MFG. The effectiveness of SPARX, a computerised self help intervention for adolescents seeking help for depression: randomised controlled non-inferiority trial. BMJ. 2012;344:e2598.
88. Fleece R, Penrose A. Building a Healthier Washtenaw. Washtenaw County Health Department; 2013. p. 1–123. (Community Health Assessment Community Health Improvement Plan).
89. Corrigan PW, Morris SB, Michaels PJ, Rafacz JD, Rüsch N. Challenging the public stigma of mental illness: a meta-analysis of outcome studies. Psychiatr Serv. 2012;63(10):963–73.
90. Fuhr DC, Salisbury TT, De Silva MJ, Atif N, van Ginneken N, Rahman A, et al. Effectiveness of peer-delivered interventions for severe mental illness and depression on clinical and psychosocial outcomes: a systematic review and meta-analysis. Soc Psychiatry Psychiatr Epidemiol. 2014;49(11):1691–702.
91. Pfeiffer PN, Heisler M, Piette JD, Rogers MAM, Valenstein M. Efficacy of peer support interventions for depression: a meta-analysis. Gen Hosp Psychiatry. 2011;33(1):29–36.
92. Watson AC, Otey E, Westbrook AL, Gardner AL, Lamb TA, Corrigan PW, et al. Changing middle schoolers' attitudes about mental illness through education. Schizophr Bull. 2004;30(3):563–72.
93. IBM SPSS statistics for windows. Armonk, NY: IBM; 2013.
94. Topol E. The patient will see you now: the future of medicine is in your hands. New York, NY: Basic Books; 2015.
95. Spring 2015 Global Attitudes survey [Internet]. Pew Research Center; 2015. Available from: http://www.pewglobal.org/2015/06/23/spring-2015-survey/

96. Editor. Aussie teens and kids online [Internet]. 2016 [cited 2017 Feb 20]. Available from: http://www.acma.gov.au/theACMA/engage-blogs/engage-blogs/Research-snapshots/Aussie-teens-and-kids-online

97. Tighe J, Shand F, Ridani R, Mackinnon A, Mata NDL, Christensen H. Ibobbly mobile health intervention for suicide prevention in Australian Indigenous youth: a pilot randomised controlled trial. BMJ Open. 2017;7(1):e013518.

98. Lee R, Gortmaker S. Health dissemination and implementation within schools. In: Dissemination and implementation research in health: translating science to practice. Oxford: Oxford University Press; 2012.

99. Poushter J. Smartphone ownership and internet usage continues to climb in emerging economies [Internet]. Pew Research Center's Global Attitudes Project. 2016 [cited 2017 Feb 14]. Available from: http://www.pewglobal.org/2016/02/22/smartphone-ownership-and-internet-usage-continues-to-climb-in-emerging-economies/

100. Review: Little Prince is Depressed (Hong Kong). Beacon [Internet]. [cited 2017 Feb 14]. Available from: https://beacon.anu.edu.au/service/website/view/37/1

101. beyondblue. Chinese MoodGYM Project [Internet]. [cited 2017 Feb 14]. Available from: https://www.beyondblue.org.au/about-us/research-projects/research-projects/chinese-moodgym

102. Horn AB, Cañizares C, Gómez Y. Prevention of adolescent depression in the Spanish-speaking World. Int J Environ Res Public Health. 2014;11(6):5665–83.

103. Barry MM, Clarke AM, Jenkins R, Patel V. A systematic review of the effectiveness of mental health promotion interventions for young people in low and middle income countries. BMC Public Health. 2013;13:835.