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Authors

Link, Bruce G
DuPont-Reyes, Melissa J
Barkin, Kay
et al.

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A School-Based Intervention for Mental Illness Stigma: A Cluster Randomized Trial

Bruce G. Link, PhD,^a Melissa J. DuPont-Reyes, PhD,^b Kay Barkin, BA,^c Alice P. Villatoro, PhD,^b Jo C. Phelan, PhD,^d Kris Painter, PhD^e

abstract

OBJECTIVES: To determine the effectiveness of a school-based curriculum, Eliminating the Stigma of Differences (ESD), in improving attitudinal and/or behavioral contexts regarding mental illness in schools and increasing the likelihood that youth seek treatment for mental health problems when needed.

METHODS: We conducted a cluster randomized trial in sixth-grade classes from 14 schools in 2011 and 2012 with follow-up at 6-month intervals through 24 months (2012–2015). Using a fully crossed $2 \times 2 \times 2$ factorial design, we compared ESD to a no-intervention control and to 2 comparator interventions: (1) contact with 2 young adults with a history of mental illness and (2) exposure to antistigma printed materials. We implemented interventions in classrooms in an ethnically and socioeconomically diverse school district. There were 416 youth who participated in the follow-up, and 312 (75%) of these participated for the full 2 years. Outcome measures were knowledge and positive attitudes, social distance from peers with mental illness, and mental health treatment seeking.

RESULTS: Youth assigned to ESD reported greater knowledge and positive attitudes and reduced social distance (Cohen's $d = 0.35$ and 0.16 , respectively) than youth in the comparator interventions and no-intervention groups across the 2-year follow-up. Youth with high levels of mental health symptoms were more likely (odds ratio = 3.51 ; confidence interval = 1.08 – 11.31) to seek treatment during follow-up if assigned to ESD than if they were assigned to comparator interventions or no intervention.

CONCLUSIONS: ESD shows potential for improving the social climate related to mental illnesses in schools and increasing treatment seeking when needed. ESD and interventions like it show promise as part of a public mental health response to youth with mental health needs in schools.



^aDepartment of Sociology, School of Public Policy, University of California, Riverside, Riverside, California; ^bLatino Research Institute, The University of Texas at Austin, Austin, Texas; ^cMental Health Connection of Tarrant County, Fort Worth, Texas; ^dDepartment of Sociomedical Sciences, Mailman School of Public Health, Columbia University, New York, New York; and ^eSchool of Social Work, University of Texas Arlington, Arlington, Texas

Dr Link undertook the data analysis, produced the first draft of the manuscript, reviewed and revised the manuscript after receiving feedback from coauthors, and contributed to the development of the design, measures, and analytic plan for the overall study as coprincipal investigator of the National Institute of Mental Health–funded study; Dr DuPont-Reyes contributed to the development of the data collection instruments, participated in the implementation and management of the study, contributed to the preparation of the data for analysis, and critically reviewed the analysis and writing of the current manuscript; Ms Barkin led the development of the curriculum intervention, provided feedback on the analysis, and critically reviewed the manuscript; Dr Villatoro assisted with data merging, cleaning, and analysis and critically reviewed and revised the manuscript; Drs Phelan and Painter contributed to the conceptualization and design of the original National Institute of Mental Health study, provided feedback on the analysis, and critically reviewed the current manuscript; and all authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

WHAT'S KNOWN ON THIS SUBJECT: Attitudes toward mental illness develop early in life; youth with mental health problems encounter bullying, and only small proportions of those with mental health problems receive treatment. Limited evidence suggests that short-term improvements in preadolescents' knowledge and attitudes are possible.

WHAT THIS STUDY ADDS: A cluster randomized, school-based intervention implemented in a multiethnic community sample shows that an antistigma curriculum intervention improves knowledge and attitudes, reduces exclusionary tendencies, and leads youth with mental health problems to seek treatment in a 2-year longitudinal follow-up study.

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A long tradition of research has examined stigma toward people who develop mental illnesses,¹ pointing to how such stigma can harm social relations, lower self-esteem, and block entry into mental health treatment.²⁻⁵ With respect to the experience of young people, stigma potentially contributes to problems such as large proportions of youth with mental health problems not receiving treatment for those problems,^{6,7} experiencing bullying and exclusion,^{8,9} and rising suicide rates among young people in the United States.¹⁰ The stigmatizing attitudes that may contribute to these problems begin early in life, and schools are important contexts in which mental health problems are experienced and stigma is enacted.¹¹⁻¹⁴ Schools are also a powerful socializing institution and confer knowledge, attitudes, and beliefs about a host of circumstances youth will confront as they grow and develop. It follows that a response to problems of mental illness stigma might be usefully implemented in school settings and that such a response might increase knowledge, improve attitudes, reduce exclusion, and help youth with mental health problems find their way to treatment. The current study assesses the effectiveness of mental illness stigma interventions in a 2-year longitudinal follow-up study of sixth-grade youth attending school in a multiethnic school district in Texas.

Few studies have sought to intervene early, address stigma, and advance knowledge and attitudes that might facilitate treatment seeking. Six studies of preadolescents¹⁵⁻²⁰ implemented curricula designed to reduce stigma. Three included control groups,^{16,18,20} and 3 included follow-ups of 6 weeks to 4 months postintervention.^{16,19,20} None assessed treatment-seeking behaviors, and none assessed students beyond 4 months. Comprehensive reviews of the larger

number of studies of high school students point to the need for studies with longer follow-up, measures of treatment-seeking behaviors, and comparison of multiple interventions.^{21,22}

We conducted a multipronged intervention with randomization of intervention arms to sixth-grade classes. Intervention modalities included the following: (1) a curriculum intervention, Eliminating the Stigma of Differences (ESD), which was our primary intervention of interest; (2) a contact intervention; and (3) saturation of classrooms with antistigma printed materials. These interventions were fully crossed with a no-intervention control. In a previous report, we examined short-term effectiveness on youth attitudes and beliefs and found that the curriculum intervention improved mental health knowledge and attitudes.²³

Although useful, previous studies leave critical questions unanswered. First, evidence about the sustainability of beneficial changes is lacking because previous studies had relatively short or no follow-up. Second, no evidence exists concerning changes in treatment seeking among youth in need. The current analysis provides such evidence by assessing knowledge and attitude change at 6, 12, 18, and 24 months postintervention. This longitudinal design also allows for an evaluation of whether the interventions changed treatment-seeking behaviors among youth who experienced mental health problems. The racial, ethnic, and socioeconomic diversity of the study sample also allowed us to determine if intervention effects differed across social groupings.

METHODS

Study Design

The study was conducted in an urban school district in Texas with

randomization of interventions to schools. All interventions were administered by physical education teachers, who are responsible for the district-wide sixth-grade health curriculum. The superintendent of schools sent letters to principals within the district introducing the study; 16 principals agreed to participate. Schools were ranked according to performance on statewide standardized examinations and were combined to create relatively equal scoring pairs of schools that were then randomly assigned in blocks of 2 to the 8 cells of the fully crossed design by the study team (Supplemental Table 3). Before the study began, 2 schools dropped out for nonstudy-related reasons. Because the 2 schools were large in size, the study was repeated during a second academic year with a new set of sixth-grade students in 5 of the smaller participating schools because they were demographically similar to the lost schools.²³ The interventions assigned to the lost schools were randomly allocated to these replacement schools. No one at the schools knew of their assigned intervention arm before deciding to participate. All sixth-graders in participating schools were eligible, and students were excluded if they did not receive parental consent and give their assent for participation. The institutional review boards of Columbia University Herbert and Florence Irving Medical Center and My Health My Resources of Tarrant County, the county's local mental health authority, approved the study.

Interventions were cluster randomized to schools because individual randomization was not practical and would not reflect the way the interventions would be delivered if adopted for widescale use. Additionally, cluster randomization reduced the possibility of contamination that might occur if participants were individually randomized and interacted with other

students in the same school about the interventions they received.

Participants and Procedures

The study included a previously published,²³ in-school pre-post assessment (Phase I) and longitudinal follow-up (Phase II) with in-home assessments at 6, 12, 18, and 24 months postintervention (2012–2015). On initial contact with research staff and before randomization, parents and participants were able to consent and assent to Phase I only or to Phase I and Phase II. In Phase I, 751 of the 1252 invited (60%) students agreed to participate, and 721 completed such participation. Of the 751, 484 (64.4%) agreed to participate in both Phase I and Phase II (Supplemental Table 4 includes Phase II participation rates by demographic and other variables). Of those agreeing to Phase II, 416 (87%) completed at least 1 assessment in Phase II; 99% of Phase II participants ($n = 412$) participated at 6 months, 89% ($n = 370$) participated at 12 months, 81% ($n = 338$) participated at 18 months, and 75% ($n = 312$) participated at 24 months. Because of the nature of the interventions, neither teachers nor participants were blinded to the interventions received. Follow-up assessments were self-administered on laptop computers in each participant's home. The Phase II sample ($N = 416$) was, on average, 11.5 years old, and 56% were girls. Forty-four percent self-identified as Latino, 22.4% as African American, 26.3% as white, and 7.4% as other; results that correspond relatively closely to the ethnic distribution in the population of the schools we studied at the time of recruitment (49.7% Latino, 19.9% white, 21.7% African American, and 8.7% other race and/or ethnic groups).²⁴ Parent or guardian educational attainment was 17% less than high school, 59% high school graduate or some college, and 23% college graduate, figures that

correspond relatively closely to population estimates of the city where our study was conducted (15.8% less than high school, 55.5% high school or some college, and 28.8% college graduate).²⁵

We assessed the possibility of selective attrition after intervention assignment among participants who agreed to Phase II and found no statistically significant differences by age, sex, race and/or ethnicity, social desirability bias, intervention group assignment, preintervention attitudes, primary language spoken at home, or parent or guardian educational attainment between those who eventually participated ($n = 416$) and those who did not ($n = 68$; Supplemental Tables 5 and 6).

Interventions

We tested ESD against comparator interventions and a no-intervention group control. Each intervention was developed to correspond with how it might actually be implemented in school settings rather than to achieve an equal balance of time devoted to each.

Curriculum

ESD is a 3-module, 3-hour curriculum delivered within 1 week, with each module involving a didactic component, group discussion, and homework exercises. Module 1 addresses the bases on which others are judged to be different; the definition, causes, and consequences of stigma; ways to end stigma; an overview on the definition, description, causes, and treatments of mental illness; and barriers to treatment seeking. Modules 2 and 3 address specific mental disorders, including attention-deficit/hyperactivity disorder, anxiety disorders, depression, schizophrenia, and bipolar disorder and include content that stimulates empathy (Supplemental Table 7). A video with an explanation of the curriculum's purpose and a walkthrough to help

teachers with its presentation was provided. Fidelity was reliably assessed by study staff and found to be generally high when using a 60-item measure based on 2 existing tools with good psychometric properties.²³

Contact

Two young adults, 1 man and 1 woman, with histories of hospitalization for bipolar disorder each prepared and delivered a 10-minute in-class presentation about their experiences, which was then followed by a group discussion moderated by teachers. Guided by previous research, the presentations were constructed to moderately disconfirm stereotypes of mental illness.²⁶

Printed Materials

Teachers displayed posters in classrooms for 2 weeks and provided students with bookmarks that referred to people with mental illnesses in terms of the individuals' personal traits and abilities rather than language that labels people as "mentally ill."

Measures

All outcome measures were administered at each wave of data collection (preintervention, 3 weeks postintervention, and then 6, 12, 18, and 24 months postintervention). Question wording and descriptive frequencies are found in Supplemental Tables 8 through 10.

Knowledge and Positive Attitudes ($\alpha = .78$) is a 21-item measure adapted from Wahl et al¹⁶ assessing youth knowledge about and attitudes toward mental illness. High scores indicate greater knowledge and more positive attitudes.

Children's social distance ($\alpha = .89$) is a 6-item measure gauging the extent to which youth are unwilling to interact with someone who is identified as having a mental illness, including as a lunchmate, friend, or

collaborator on a school project.¹⁶ High scores indicate a greater desire for social distance.

Mental health treatment seeking was assessed by asking whether youth had taken medicine for a mental health problem or talked to a therapist or counselor about a mental health problem (coded “1” if either or both, coded “0” if neither).

A self-reported mental health symptoms checklist ($\alpha = .87$) uses 21 stem questions from the National Institute of Mental Health Diagnostic Interview Schedule for Children (DISC), Version IV²⁷ to identify youth with a high probability of needing professional mental health treatment (Supplemental Table 11). Youth endorsing two-thirds or more of the symptoms either at the beginning of the study (average of pretest and post-test scores) or at the end (average of the 18- and 24-month scores) were categorized as having high probability of need; 18.5% of youth met these criteria.

Control variables are sex, age, a 6-item scale of social desirability bias,^{28,29} self-identified race and/or ethnicity, parent or guardian educational attainment, and the primary language spoken at home.

Analysis

We assessed clustering of (1) youth within classrooms and (2) follow-up assessments within youth using intraclass correlation coefficients. Clustering by classroom was modest with intraclass correlation coefficients for each outcome <10% (knowledge and attitudes 0.094, social distance 0.081, and treatment seeking 0.019). Clustering of occasions within youth was substantial and is addressed by using generalized estimating equations (GEEs).³⁰ Because we found preintervention differences between cluster randomized intervention groups on some variables (Supplemental Table 12), we control for preintervention values of the dependent variable and other potentially important covariates.

In analyses of knowledge and attitudes and social distance, we show effects for each of the intervention groups separately and test for interactions between interventions in our fully crossed design. If no significant interactions between interventions were found, only the main effects of each intervention with dummy codes (1 = receiving intervention; 0 = not receiving intervention) are presented. For mental health treatment seeking, for which the number of cases in the

relevant high-symptom group is relatively small ($n = 77$), we simply compare youth receiving and not receiving the curriculum.

We also assess whether intervention effects persist by examining interactions between intervention and time period. Finally, we explore whether interventions are significantly more or less effective for groups, defined by preintervention attitudes and sociodemographic factors.

Missing data are addressed by using multiple imputation via chained equations in Stata 15.1 (Stata Corp, College Station, TX).³¹ Twenty-five data sets were imputed and recombined by using Rubin’s rules.³² Results presented imputed values for covariates but not dependent variables. Sensitivity analyses that used (1) complete cases and (2) an imputation of all variables, including dependent variables, resulted in similar conclusions (Supplemental Tables 13 through 15).

RESULTS

Does the Curriculum Intervention Improve Knowledge and Attitudes and Reduce Social Distance?

We found no significant 3- or 2-way interactions between interventions and therefore present results

TABLE 1 Multiple Linear Regression (GEEs) Showing the Effect of Preintervention Levels of the Outcome Variable, Time Period and Curriculum, Contact, and Materials Interventions on Knowledge and Attitudes and Social Distance: Regression Coefficients and Robust SEs ($n = 416$ Youth; $n = 1432$ Observations for Knowledge and Attitudes; $n = 1428$ Observations for Social Distance)

Variables	Knowledge and/or Attitudes		Social Distance	
	Equation 1 Unadjusted	Equation 2 Adjusted ^a	Equation 1 Unadjusted	Equation 2 Adjusted ^a
Preintervention knowledge and attitudes	0.514*** (0.037)	0.502*** (0.037)	—	—
Preintervention social distance	—	—	0.483*** (0.037)	0.473*** (0.037)
Time period (6 mo is reference)				
12 mo	0.006 (0.015)	0.006 (0.015)	−0.041 (0.023)	−0.041 (0.023)
18 mo	−0.002 (0.016)	−0.002 (0.017)	−0.003 (0.029)	−0.003 (0.029)
24 mo	0.044* (0.020)	0.044* (0.020)	−0.103 (0.033)	−0.014 (0.033)
Curriculum (1), all other interventions and no interventions (0)	0.139*** (0.030)	0.103*** (0.031)	−0.123* (0.049)	−0.103* (0.051)
Contact (1), all other interventions and no interventions (0)	0.002 (0.029)	0.005 (0.028)	0.052 (0.048)	0.049 (0.048)
Material (1), all other interventions and no interventions	−0.001 (0.028)	0.016 (0.028)	−0.029 (0.050)	−0.044 (0.052)

—, not applicable.

^a Adjusted for child age, sex, race and/or ethnicity, social desirability score, caregiver education, and whether English was the main language spoken in the home.

* $P < .05$.

*** $P < .001$.

showing the main effects. Table 1, Equation 1 shows the effect of each intervention while controlling for time period and preintervention values of the dependent variable. Neither the contact nor the materials intervention was significant for either dependent variable. Exposure to the curriculum intervention is associated with a significant increase in knowledge and attitudes ($b = 0.139$; $P < .001$; Cohen's d 0.35) and a significant decrease in social distance ($b = -0.123$; $P < .05$; Cohen's d 0.16). Equation 2 shows that the curriculum remains significantly associated with both knowledge and attitudes and social distance when controlling for covariates. Figure 1 shows means adjusted for covariates calculated for each dependent variable at each time period and indicates that the curriculum intervention is both beneficial (higher knowledge and attitudes and lower social distance) and enduring in its effect over the study period.

Do Curriculum Effects on Knowledge and Attitudes and Social Distance Vary by Youth Attributes?

We assessed interactions between assignment to the curriculum and preexisting attitudes, social desirability bias, sex, age, race and/or ethnicity, and parent or guardian educational attainment on knowledge and attitudes and social distance. Of the 16 interactions examined, 1 was significant: Latino youth did not experience curriculum-associated reductions in social distance (Supplemental Fig 4). We found no significant interaction between the curriculum and race and/or ethnicity on knowledge and attitudes or treatment seeking and no significant interaction between the curriculum and any of the other variables examined.

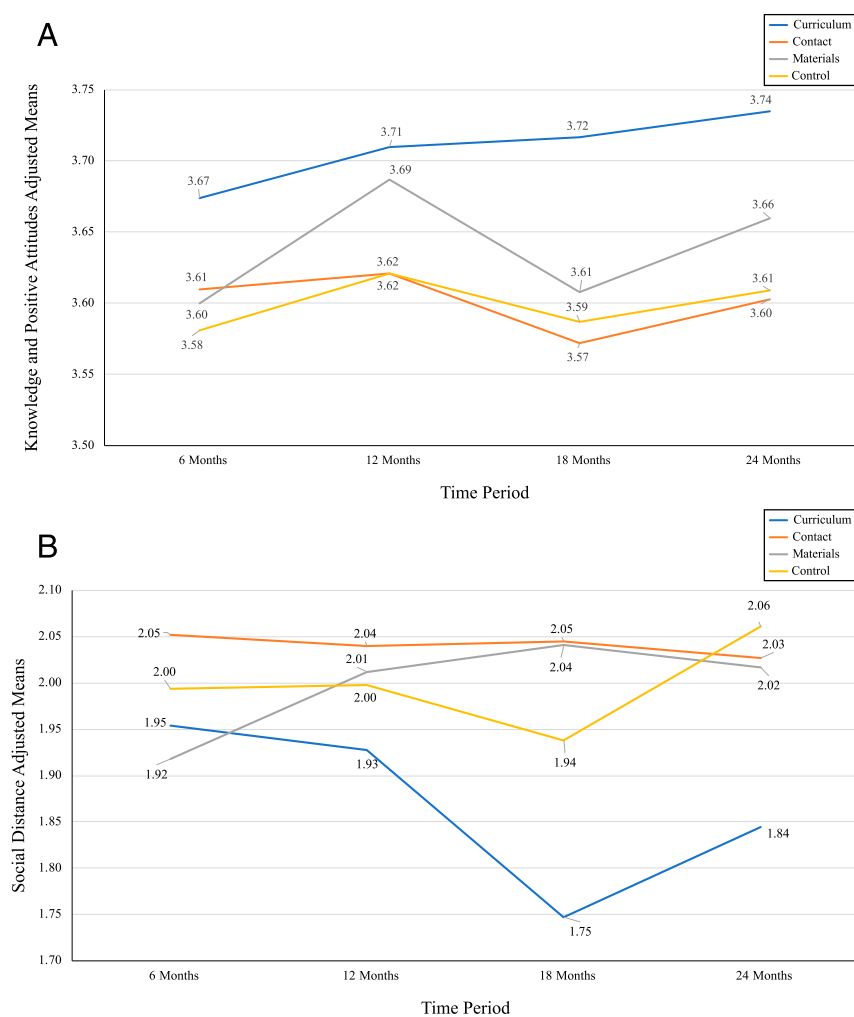


FIGURE 1 Mental illness stigma outcome variables: adjusted means for intervention groups at 6-, 12-, 18-, and 24-month follow-up postintervention in the Texas Stigma Study ($n = 416$). Means are adjusted for preintervention knowledge and attitudes, child age, sex, race and/or ethnicity, social desirability score, parent or guardian educational attainment, and English as the primary language spoken in the home. A, Knowledge and positive attitudes outcome. B, Social distance outcome.

Does the Curriculum Intervention Lead Youth With High Symptom Levels to Seek Treatment?

Table 2 compares youth with high symptom levels assigned to the curriculum with youth with high symptom levels who were not assigned to the curriculum. As expected, preintervention mental health treatment seeking is significantly associated with treatment seeking postintervention. Importantly, whether before adding covariates (odds ratio [OR] = 3.51; confidence interval [CI] = 1.08–11.39)

or after doing so (OR = 3.90; CI = 1.09–13.87), assignment to the curriculum is associated with increased odds of mental health treatment seeking. Because postintervention treatment seeking could represent first-ever treatment seeking, a continuation of treatment seeking, or return to treatment seeking, supplementary analyses examined curriculum effects for these outcomes separately (Supplemental Table 16) and found ORs that were similar in magnitude to those reported above but that were not statistically significant because of

TABLE 2 Logistic Regression (GEE) Showing the Effect of the ESD Curriculum Intervention on Treatment Seeking for Mental Health Problems Among Youth With High Symptom Levels ($n = 77$ Youth; $n = 275$ Observations)

Variables	Mental Health Help Seeking (Therapist or Taking Medication = 1, All Others = 0), OR (95% CI)	
	Equation 1 Unadjusted	Equation 2 Adjusted for Covariates ^a
Preintervention mental health help seeking	7.49*** (2.20–25.43)	10.28*** (1.13–1.50)
Time period (6 mo is reference)		
12 mo	1.64 (0.93–2.88)	1.77 (0.91–3.44)
18 mo	1.10 (0.55–2.18)	1.12 (0.51–2.45)
24 mo	1.27 (0.60–2.69)	1.34 (0.57–3.16)
Curriculum (1), all other interventions and no intervention (0)	3.51* (1.08–11.39)	3.90* (1.09–13.87)

^a Adjusted for child age, sex, race and/or ethnicity, social desirability score, caregiver education, and whether English was the main language spoken in the home.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

smaller sample sizes. We found no evidence of interaction between curriculum assignment and time period. Figure 2 shows predicted probabilities of treatment seeking, with youth with high symptom levels assigned to curriculum being much more likely to experience treatment seeking than youth with high symptom levels assigned to comparator interventions or no intervention.

In contrast, we found no significant effect of the curriculum intervention on treatment seeking in youth with fewer symptoms. A test of the interaction (not shown) revealed that the effect of curriculum assignment was significantly different in the high- as opposed to the low-symptom group. Figure 2 shows predicted probabilities in the lower-symptom group and indicates no effect of the curriculum in relation to comparator interventions and the no-intervention control.

DISCUSSION

We examined whether a school-based antistigma curriculum intervention targeted early in the life course might improve the context in which mental health problems are experienced, increasing knowledge, improving

attitudes, and inducing treatment seeking when mental health problems are present. The results generally support an impact of the ESD curriculum in achieving these goals. Youth assigned to the curriculum intervention experienced significantly increased knowledge and more positive attitudes toward mental illness and reported significantly reduced social distance from youth with mental illness. Because our study is unique in that it is a cluster randomized design among preadolescent youth with 2-year follow-up, we cannot make direct comparisons to effect sizes achieved in other studies. However, a meta-analysis of mental health stigma interventions among adults and adolescents (not preadolescents) reported average effect sizes for randomized studies to be smaller than ours (0.21 for attitudes and knowledge and 0.10 for social distance).³³ Additionally, participants in the ESD intervention were substantially more likely to seek treatment for mental health problems if they experienced them than were youth in other intervention groups or control group, a finding that, to our knowledge, has not previously been addressed in stigma-intervention research.

A unique aspect of our design was the 2-year follow-up, which revealed that intervention effects did not appreciably dissipate over that period. Additionally, with 1 exception (Latino youth with respect to social distance), there were no significant differences in the effectiveness of the curriculum intervention by race and/or ethnicity, sex, educational level of caregivers, or youth preintervention attitudes.

We found no effect of the contact intervention, although contact has often been shown to be the most effective way to change attitudes. A potential explanation is that contact is not as effective in youth, a possibility that is supported by a meta-analysis showing diminished effects of contact compared with educational interventions in adolescents.³³

Our study is limited by its use of self-reported data for both attitudes and treatment-seeking behaviors. Our use of self- rather than interviewer-administered survey instruments and our ability to control for social desirability bias somewhat mitigate our concerns about reporting bias. Because treatment seeking is self-reported by the youth participating, we were not able to acquire details about the type or adequacy of treatment. Loss to follow-up, which is a common problem for longitudinal studies, is another limitation. Somewhat reassuring was the finding of no significant differences between those successfully followed and those lost to follow-up, the correspondence between our achieved sample and the population from which they were drawn in terms of race and/or ethnicity and socioeconomic status, and our multiple sensitivity analyses implemented to address missing values. Despite matching schools on test scores, our cluster randomization of classrooms resulted in preintervention differences between groups on some baseline characteristics,

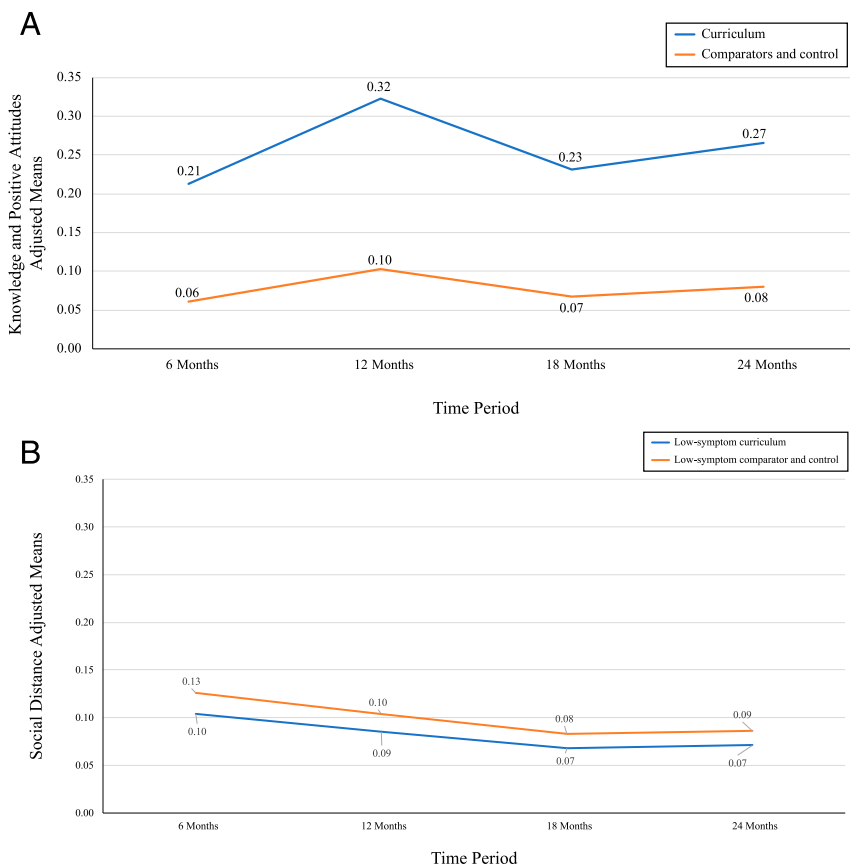


FIGURE 2 Predicted probabilities of mental health treatment seeking at 6-, 12-, 18- and 24-month follow-up among youth with high and low symptoms in the Texas Stigma Study. Predicted probabilities adjusted for preintervention mental health treatment, child age, sex, race/ethnicity, social desirability score, parent/guardian educational attainment and English as primary language spoken in the home. Results show probabilities with covariates set at mean values. Curriculum versus comparator and no intervention $P < .05$. A, Youth with high symptom levels ($n = 77$). B, Youth with low symptom levels ($n = 336$).

leading us to adjust for covariates and preintervention measures of dependent variables. Although diverse in terms of race and/or ethnicity and parental education, our study is limited in generalizability

because it was conducted in 1 school district in Texas.

Our study joins a handful of others that have intervened with preadolescent students and shown

positive effects on knowledge and attitudes. We added a substantially longer follow-up and included measures of treatment-seeking behaviors in an intervention designed to be relatively easily disseminated. Our study, in combination with other studies, suggests strongly that youth can be positively influenced at a relatively young age, fostering changes in mental health attitudes and behaviors that last, as our study has shown, for at least 2 years. Although we cannot know from the data in hand, we might expect that if interventions were delivered annually in every sixth-grade class, the context experienced by people with mental illness could improve even more, a possibility that future research might examine. We do know that negative attitudes toward mental illnesses and the exceptionally large percentage of people who experience but do not receive treatment for such illnesses are problems that have been with us for a long time. Interventions such as ESD represent a partial but positive response to this public mental health challenge.

ABBREVIATIONS

CI: confidence interval
 DISC: Diagnostic Interview Schedule for Children
 ESD: Eliminating the Stigma of Differences
 GEE: generalized estimating equation
 OR: odds ratio

This trial has been registered at www.clinicaltrials.gov (identifier NCT03597048).

Deidentified individuals' participant data will not be made available.

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Address correspondence to Bruce G. Link, PhD, School of Public Policy, University of California, Riverside, Interdisciplinary South 4133, 900 University Ave, Riverside, CA 92521. E-mail: bruce.link@ucr.edu

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