Published in final edited form as:

Soc Sci Med. 2011 June ; 72(12): 2011–2019. doi:10.1016/j.socscimed.2011.04.006.

Feasibility, Acceptability, and Initial Efficacy of a Knowledge-Contact Program to Reduce Mental Illness Stigma and Improve Mental Health Literacy in Adolescents

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Abstract

The purpose of this school-based cluster-randomized trial was to determine the initial acceptability, feasibility, and efficacy of an existing community-based intervention, *In Our Own Voice*, in a sample of US adolescent girls aged 13–17 years (n=156). *In Our Own Voice* is a knowledge-contact intervention that provides knowledge about mental illness to improve mental health literacy and facilitates intergroup contact with persons with mental illness as a means to reduce mental illness stigma. This longitudinal study was set in two public high schools located in a southern urban community of the U.S. Outcomes included measures of mental illness stigma and mental health literacy. Findings support the acceptability and feasibility of the intervention for adolescents who enrolled in the study. Findings to support the efficacy of *In Our Own Voice* to reduce stigma and improve mental health literacy are mixed. The intervention did not reduce mental illness stigma or improve mental health literacy at one week follow up. The intervention did not reduce mental illness stigma at 4 and 8 weeks follow up. The intervention did improve mental health literacy at 4 and 8 weeks follow up. Previous studies have assessed the preliminary efficacy *In Our Own Voice* among young adults; rarely has *In Our Own Voice* been investigated longitudinally and with adolescents in the United States. This study provides initial data on the effects of *In Our Own Voice* for this population and can be used to further adapt the intervention for adolescents.

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Keywords

Mental Illness; Stigma; Adolescents; Knowledge; Contact; Mental Health; Mental Health Literacy; Young women; USA

Introduction

Reducing mental illness stigma and improving mental health literacy are national health objectives that are necessary to enhance the health outcomes of adolescents and future generations of young adults (U.S. Department of Health and Human Services, 1999, 2000; President's New Freedom Commission on Mental Health, 2003). Prior research has confirmed that adolescents report moderate levels of mental illness stigma and low mental health literacy (Chandra et al., 2007; Pinto-Foltz, et al., 2010). Adolescents with mental illness fear the discovery of their mental illness by their peers, school personnel, and others in their social network (Moses, 2010). Only 30% of the adolescents with mental illness enter mental health treatment (U.S. Department of Health and Human Services, 1999, 2000). Of the adolescents who enter mental health treatment, high mental illness stigma and low mental health literacy are key factors that contribute to premature termination of mental health treatment (Corrigan, 2004; U.S. Department of Health and Human Services 1999; 2000). However, most adolescents will continue to forgo beneficial and life-saving mental health treatment unless barriers to mental health treatment, mental illness stigma and mental health literacy, are addressed (Institute of Medicine, 2002).

Among adolescents in high school, mental health treatment seeking is significantly influenced by the opinions of peers and influential adults in the adolescent's social network (Moses, 2010). Developmental theories, like Erikson's stages of psychosocial development (1980) and Bronfenbrenner's bioecological model (1979), underscore the contributions of peers and influential adults on adolescent help seeking behavior. Within the context of mental illness stigma, Pescosolido, Martin, Lang, and Olafsdottir's (2008) Framework Integrating Normative Influences on Stigma (FINIS) illustrates the multiple levels, beyond the individual, that influence mental illness stigma. Studies among adolescents find that adolescents prefer to discuss mental health issues with their peers, but are reluctant to do so because they anticipate negative and stigmatizing responses (Marcell et al., 2007; Pinto-Foltz et al. 2010; Wisdom, et al. 2007). Social interactions are necessary for mental illness stigma to occur and the adolescent's social network is influential (Pescosolido et al., 2007). Thus, utilizing a universal approach that includes adolescent peers with and without mental illness may effectively promote an inclusive adolescent peer environment that fosters help seeking for mental illness (Crosnoe et al., 2008).

Interventions to Reduce Mental Illness Stigma and Improve Mental Health Literacy

Intervention Studies With Adults

Research studies that investigate the efficacy of interventions to reduce mental illness stigma and improve mental health literacy have been conducted with adults (Pinto-Foltz & Logsdon, 2009a). A variety of approaches to improve these constructs have been proposed. Studies that focus on mental illness stigma have been primarily based on Allport's (1954) intergroup contact theory. Intergroup contact theory suggests that contact under optimal conditions—equal status between groups, common goals, intergroup cooperation, and support of laws and authorities—can reduce prejudice. Pettigrew and Tropp's (2006) meta-analysis partially supports Allport's intergroup contact theory. Specifically, contact is

essential to reduce prejudice, but not all optimal conditions need to be met to reduce prejudice (Pettigrew, et al.2006).

Mental health literacy is the knowledge and beliefs about mental illness that help individuals recognize, manage, and prevent illness (Jorm, et al., 1997). Intervention research in this area is limited, with most studies conducted in settings outside the United States; nevertheless, successful approaches have used narrative advertising and printed mental health information to improve mental health literacy (Chang, 2008; Walker, et al., 2010). The majority of research on mental health literacy has been descriptive and involves assessing mental health literacy by the participant's ability to identify mental disorders in vignettes (Coles, et al., 2008; Kelly, et al., 2007). Thus, the scientific basis for interventions to improve mental health literacy is not well established.

Knowledge-contact is a frequently utilized approach that involves providing knowledge about mental health in conjunction with intergroup contact (or social interaction) with individuals from different groups. Studies with adults that utilize a knowledge-contact approach have produced an immediate reduction in mental illness stigma and improvement in mental health literacy (Corrigan et al., 2007; Holmes et al., 1999; Mann et al., 2008). Contact appears to be the essential component to changing stigmatizing attitudes (Pinfold, et al., 2005); we are unaware of any studies that have shown that solely providing knowledge, without contact, is sufficient to improve help-seeking behavior.

Intervention Studies With Children and Adolescents

There are roughly a dozen existing interventions in the U.S. designed for children and adolescents to reduce mental illness stigma and improve mental health literacy (Schachter, et al., 2008). However, most of these interventions lack an evidence base to support their translation into clinical practice (Schachter, et al.). A handful of interventions with elementary and middle school children in the U.S. have been tested. These studies have successfully utilized school-based curriculum and knowledge-contact approaches (DeSocio et al., 2006; Watson et al., 2004) to reduce stigma and improve mental health literacy. These studies utilize a pre-and post-test design and do not measure the maintenance of effects over an extended time period.

Outside the U.S., there is growing body of intervention studies that aim to reduce mental illness stigma and improve mental health literacy among children and adolescents. These studies have utilized approaches like school-based curriculum, knowledge-contact, multimedia or theatrical drama approaches (Essler et al., 2006; Naylor et al., 2009; Pinfold et al., 2003; Roberts et al., 2007; Santor et al., 2007; Tolomiczenko et al., 2001). Research conducted abroad supports the efficacy of these interventions and illuminates novel approaches to reduce mental illness stigma and improve mental health literacy among adolescents in U.S. Since mental illness stigma is grounded in social relationships and the environmental context (Pescosolido, et al. 2007), efficacy of interventions tested in other cultural groups cannot be generalized to American adolescents. In other words, it is unclear if these interventions will replicate an equivalent therapeutic effect among American adolescents because of differences in the cultural influences on mental illness stigma and mental health literacy.

***In Our Own Voice* Intervention**

Prior work by Pittman, Noh, & Coleman (2010), Wood & Wahl (2006), and Rusch, Kanter, Angelone, & Ridley (2008), all among older adolescents (college age students) and young adults (graduate students), provide initial evidence for the efficacy for a knowledge-contact intervention called, *In Our Own Voice*. *In Our Own Voice* is administered by the National

Alliance on Mental Illness and has theoretical underpinnings from Fischer's narrative paradigm theory (Fischer, 1987) (Pinto-Foltz & Logsdon, 2009b). *In Our Own Voice* incorporates three approaches— narrative storytelling, discussion, and a video presentation—to reduce mental illness stigma and improve mental health literacy (Pinto-Foltz & Logsdon, 2009b). Over 200,000 people (including adolescents) in the U.S. have experienced *In Our Own Voice*; however, the intervention's short- and intermediate-term effects on mental illness stigma and mental health literacy have not been evaluated in high school age adolescents (Pinto-Foltz & Logsdon, 2009b). A detailed synopsis of *In Our Own Voice* is provided by Pinto-Foltz & Logsdon (2009b) and at www.nami.org.

Overview of This Study

There are several known interventions to reduce mental illness stigma and improve mental health literacy, but many of these interventions have not been scientifically evaluated for their efficacy. One such intervention is *In Our Own Voice*. We sought to examine this program. The purpose of this study was to examine the feasibility, acceptability, and initial efficacy of *In Our Own Voice* among female adolescents. Given the prior use of *In Our Own Voice* and initial evidence in college age students (Pittman et al., 2010; Rusch et al., 2008; Wood et al. 2006;), we hypothesized that *In Our Own Voice* would be highly feasible and acceptable to adolescents. We hypothesized that adolescent participants who received *In Our Own Voice* would have less mental illness stigma and higher mental health literacy immediately (T2, one week after the intervention) and intermediately (T3 and T4, 4 and 8 weeks after the intervention) when compared to adolescent participants who did not receive the intervention.

Methods

Design

This school-based study utilized a non-blinded cluster-randomized trial design. Since adolescents interact with other adolescents within their grade levels, randomization of subjects into treatment groups was not feasible and increased the risk of diffusion of treatment (Murray, 1998). For this study, there were four groups. For the first school, all ninth grade participants at one school formed the intervention group, while all tenth grade participants at the same school formed the control group. The same was true for the second school, where all ninth grade participants formed one group (control), and the tenth grade participants at the same school formed an opposing group (intervention). Since baseline differences are unknown until after the study begins, the study design was purposely formulated to ensure there was an intervention and control group available at each study site if treatment groups could not be combined across schools.

Setting and Sample

This study was conducted in two public high schools in a southern urban area of the U.S beginning in December 2008 through March 2009. A convenience sample of adolescent girls was recruited from these schools. Enrollment criteria for study inclusion were: female adolescents, 13–17 years of age, enrolled in the ninth or tenth grade and able to communicate in English. To reduce the threat of diffusion of treatment, adolescents with a female sibling enrolled in an adjacent grade at the same school were excluded from the study (Shaddish et al., 2002). This study involved females only. Males were excluded because mental health messages are most effective when they are tailored to a homogenous group (Kelly et al., 2007), and extraneous variables should be minimized when initially assessing interventions for efficacy (Conn et al., 2010).

Procedures

After receiving IRB approval from the public school system and the university, all adolescent girls enrolled in the ninth or tenth grade at the two schools were approached for recruitment by the investigator in the classroom setting. During the presentation of this study, the investigator explained the study, answered questions from the adolescents, and provided a contact phone number to adolescents for parents. Adolescents who wished to participate in the study were instructed that written informed parental/guardian consent and informed assent were required for study participation. Informed consent/assent forms were returned to the investigator within one week after introducing the study to each class.

Data collection occurred at four time points over this 10-week study. At baseline (T1), all participants completed a measure of demographics to capture information about their age, race, socioeconomic level (operationalized by receipt of free or reduced school lunch), living arrangements (who they live with most of the time), and the level-of-contact report (Corrigan et al., 2005) to assess their level of exposure to persons with mental illness. Also at T1, all participants completed measures of mental illness stigma and mental health literacy. A week following T1, no data were collected and adolescents in the intervention group received *In Our Own Voice*; the control group did not receive any intervention. A week following the intervention (T2), four (T3), and eight (T4) weeks following the intervention, all participants completed the same measures of mental illness stigma and mental health literacy completed at baseline. At T2, the acceptability of the intervention was assessed by the intervention group, by completion of a seven-item questionnaire about the intervention, based on narrative paradigm theory.

Measures

Feasibility—Feasibility was assessed in three ways. First, the feasibility of enrolling adolescents into the study is described. Second, the feasibility of retaining adolescents in the 10 week longitudinal study is reported. Third, the feasibility of administering the intervention is described, as we report the number of adolescents in the intervention group who did not receive *In Our Own Voice* compared to adolescents in the intervention group who received the intervention.

Acceptability—Acceptability of the intervention was operationalized two ways: acceptability of the intervention content and method of delivery. Fischer's Narrative Paradigm Theory (Fischer, 1987) guided the assessment of the intervention content. Narrative Paradigm Theory provides a framework for understanding why individual narrative stories may be effective or ineffective in changing attitudes of listeners (Pinto-Foltz & Logsdon, 2009b). Narratives have been used to successfully reshape social norms and promote social problem solving in communities (Paluck et al., 2009), in business and marketing research to develop successful and effective messages for target audiences, and can be applied to narrative health interventions (Pinto-Foltz & Logsdon, 2009b). The content of *In Our Own Voice* was assessed by a seven-item scale based on Fischer's Narrative Paradigm Theory, which specifically examined narrative fidelity (perceived truthfulness of the story) and narrative coherence (consistency of the presenter's story with previous stories or the believability of the story). For these seven items, respondents rate the extent to which they agree or disagree with items on a 0–3 likert-type scale.

The acceptability of the method of intervention delivery (i.e. storytelling) was assessed by narrative comments of participants in response to the question, "Can you please tell me what you thought about the presentation?" The investigator recorded participant responses verbatim.

Mental illness stigma and literacy outcomes—This study evaluated mental illness stigma and mental health literacy as indicators of the intervention's efficacy.

Mental illness stigma was assessed utilizing a five-item subscale of the Revised Attribution Questionnaire by Watson et al. (2004). This subscale taps the emotional response of stigma described as aggressive emotions (anger), pro-social reaction (help, sympathy), and feelings of anxiety (scared) as identified by Angermeyer & Matschinger (1996) and Link (2004) (Pinto-Foltz et al., 2011). These five items describe situations associated with “a new student in your class that just came from another school ... you have heard the student has a mental illness.” For each item, respondents rate items on 1–7 likert-type scale the extent to which they agree or disagree with each item. A sample item is: “I will try to stay away from the new student.” The score range is 5–35, with a higher score indicating a greater negative emotional response to others with mental illness. Psychometric testing supports the reliability and validity of this subscale in adolescents (Pinto-Foltz et al., 2011). This subscale has demonstrated internal consistency in previous studies among adolescent girls; Cronbach's alpha was .77 (Pinto-Foltz, 2010). For this study, Cronbach's alpha was .73–.77.

Mental health literacy was assessed by the *In Our Own Voice* Knowledge Measure, developed by Wood and Wahl (2006). This 12-item instrument reflects the emphasized elements of the intervention and captures elements of mental health literacy important to help individuals recognize, manage, and prevent illness (Jorm et al., 1997). A sample item of the *In Our Own Voice* Knowledge Measure is: “People with mental illness can reduce their symptoms through treatment.” Respondents rate items on 1–7 likert-type scale the extent to which they agree or disagree with each item. The scoring range is 12–84 with a higher score reflecting a higher level of mental health literacy. For this study, Cronbach's alpha was .51–.66. Reliability data for this instrument is not reported in other studies.

Intervention

In Our Own Voice focuses on five components: (a) Dark Days, the person's first experience with symptoms of mental illness; (b) Acceptance, how the person has accepted the mental illness; (c) Treatment, what therapies and medications work for the person; (d) Coping, daily activities that help the person self-manage the mental illness; and (e) and Successes, Hopes, and Dreams, how the person overcomes the challenges associated with mental illness and progresses toward meeting his or her personal goals. Mental health education that is framed from a biological perspective (e.g. mental illness is not a choice) has been shown to reduce perceived responsibility for the onset of mental illness, but may worsen attitudes about the ability to recover from mental illness (Corrigan et al., 2010). *In Our Own Voice* is thought to be effective because it presents information using personal experience that considers both biological and environmental factors that may contribute to developing and recovering from mental illness.

For this study, two trained consumers administered *In Our Own Voice*. These consumers were in sustained recovery from mental illness and had recently completed an *In Our Own Voice* refresher course. Although it was the investigators' preference for presenters to be of perceived equal status to participants, The National Alliance on Mental Illness does not train individuals under 18 years of age to be *In Our Own Voice* presenters. Thus, we chose two young adult presenters, one male and one female, both Caucasian, who had extensive experience in administering the intervention to adolescents. For this study, the intervention was administered one time to three different groups (roughly equal in size) of participants on the same day during school hours. *In Our Own Voice* was administered in 60-minutes time and included the all components as described in *In Our Own Voice* training manual.

Intervention Fidelity—Intervention fidelity is the adherence of an intervention to underlying theoretical premises and the protocol (Bruckenthal et al., 2007; Sidani et al., 1998). For this study, the investigator developed, *In Our Own Voice Fidelity Checklist for Adolescents*, in collaboration with *In Our Own Voice* national trainers, to rate the degree of fidelity of each intervention session. For accurate assessment of fidelity, the intervention sessions were audio taped and reviewed by two independent raters (doctoral students in psychology and nursing) to determine if all critical components of the intervention were delivered in an identical fashion for all intervention groups. Prior to the intervention delivery, the investigator provided a brief study orientation and training to the *In Our Own Voice* presenters. This training emphasized the systematic administration of the intervention and achievement of a fidelity rating of at least 85% for all intervention sessions. Both independent evaluators rated the interventions sessions as having high fidelity with fidelity ratings of 94%–100%.

Data Analysis

SPSS 17.0 was used for the statistical analyses. To address the study aims, the following statistical analyses were conducted.

Feasibility—Feasibility was assessed in three ways. First, to assess the feasibility of enrollment, we calculated the percentage of adolescents who were approached for study participation and enrolled into the study compared to those who did not enroll into the study. Second, to capture the feasibility of retaining adolescents over 10 weeks, we calculated the percentage of adolescents that did not complete one or more data collection points compared to those that complete all data collection points. Third, to report the feasibility of administering the intervention, we calculated the percentage of adolescents who were assigned to the intervention group and completed the intervention compared to adolescents in the intervention group that did not complete the intervention due to absenteeism from school or study withdrawal.

Acceptability—To examine acceptability of the intervention content, means and standard deviations for each item of the narrative paradigm theory questions were calculated. Participants' narrative comments, in the form of quotes, contextualized findings and provided data on the acceptability of the intervention delivery.

Evaluation of Baseline Scores—First, a one-way analysis of variance and Chi-square tests were utilized to assess differences in demographics and baseline scores on outcome variables between schools, grade, and groups. Since data collection points were not equally spaced across time, except for four and eight weeks following the intervention, we computed an average intermediate effect ($T3 \text{ score} + T4 \text{ score}/2$). To ensure that T3 and T4 scores could be combined, we performed paired t-tests within treatment group between T3 and T4. Because the findings of the paired t-tests were not significant, we created a mean score for T3 and T4, which we call intermediate follow-up.

Covariates used in subsequent analyses—Although there were no statistical differences in baseline variables by grade or age, it is known that adolescents in ninth grade and tenth grade are developmentally different in regard to stage of puberty and cognitive maturation (Giedd et al., 2009; Sun et al., 2002). Additionally, the external environmental influences—like adjustment to high school, social norms, and peers—are different for ninth graders when compared to tenth graders, who have been in the high school environment for more than one year (Newman et al., 2000; Sallis et al., 2008;). In previous studies, stigma and mental health literacy have been associated with race and level-of-contact (previous exposure to mental illness) (Corrigan et al., 2001; Holmes et al., 1999; Watson et al., 2005).

Thus, these factors guided our decision to include these variables as covariates in the analyses.

Evaluation of Immediate/Intermediate Outcomes—To assess the immediate effects of the intervention on mental illness stigma and mental health literacy, we performed two multiple regressions (one for each outcome variable, mental illness stigma and mental health literacy) while adjusting for baseline mental illness stigma scores or mental health literacy scores (Senn, 2006), grade level, age, race, and level-of-contact (previous exposure to mental illness). For all statistical analyses, the .05 alpha level was used for statistical significance.

While multiple regression techniques are typically not recommended for the analysis of clustered data, since the data collected are not independent, the recommendations of analyzing clustered data as outlined by Murray (1998) were followed. Murray recommends that mixed-methods approaches are not appropriate for cluster data when there are more than two time intervals. Furthermore, it is recommended that traditional linear regression techniques can be used if the slopes of the groups are similar. Prior to developing the multiple regression models above, we verified the slopes were similar.

Results

A total of 156 female adolescents volunteered for the study: 95 in the intervention groups and 61 in the control groups. Overall, our sample consisted of mostly (69%) white females with a mean age of 15 years ($SD = .67$) of moderate to high socioeconomic level, and living in two parent homes.

Feasibility

Absenteeism and Missing Data—Due to absenteeism from school on the days data were collected, 8% of participants failed to complete the standard measures at all time points. There were no significant differences on baseline variables for those that completed all data collection points and those that did not. Thus, attrition did not appear systematic. No participants withdrew from the study. Figure 1 summarizes the participant flow through the study.

Because data were missing at random (no differential attrition) and accounted for less than 10% of cases (Allison, 2002; Wood et al., 2004), cases without complete data were removed from the analysis. Methods of imputation were considered, but not utilized because data imputation requires strong assumptions about individuals' scores and have been found to introduce bias (Molnar et al., 2008). Nevertheless, we utilized a conservative approach for data analysis, a modified intention-to-treat approach (Abraha et al., 2010). This approach included all participants, per protocol, in their originally assigned group, who had completed measures at all time points. Five participants assigned to the intervention did not receive the intervention because they were absent the day the intervention was administered. However, those with complete data remained in the intervention group for the analysis.

Study Enrollment—The feasibility of enrolling adolescents in the study was not well supported. Pre-study drop-out was high. Only 21% of eligible adolescents approached for study participation enrolled in the study. The informed consent process involved adolescents relaying study information and delivering the consent form to their parent/guardian.

Retention—The feasibility of retaining participants was supported. Once enrolled in the study, adolescents were retained over the 10 weeks. Attrition was low, only 8% did not

complete one or more of the data collection points due to absenteeism from school. Attrition did not appear differential.

Intervention Administration—The intervention was highly feasible to administer. Only 5% of adolescents in the intervention group did not receive the intervention because of absenteeism from school the day the intervention was administered. No participants withdrew from the study.

Acceptability

At T2, adolescent participants in the intervention group completed a 7-item instrument, based on narrative paradigm theory, to assess the acceptability of the content of the intervention. Mean scores for individual items of the 7-item narrative paradigm scale range from 2.2 to 2.9 and indicate that participants found the intervention content highly acceptable. Believability of the presenters' stories received highest scores on all items: consistency with previous stories and with expected presenter behaviors were scored lowest by participants.

Based on participants' narrative comments, the intervention process (storytelling) was highly acceptable to adolescent participants. Below are quotes from different participants who received the intervention.

"My friend and I felt sorry for the presenters. They went through so much. My friends left the intervention crying. we were all just really so sad that they had to go through all that."

"The intervention brought us (my friends and I) closer because I have a friend that cuts. We (my friends) never really understood why she cuts. Now that we understand, it makes us closer"

"I went home and told my parents about the intervention. They thought it was really cool that we got to hear the presenter's stories, and thought it was good for me to participate so I could learn more about mental illness."

"I went home and told my mom about the intervention. She was worried that by hearing people talk about cutting and thinking about suicide would make me want to hurt myself again. I tried to explain to her that it didn't make me want to hurt myself. It helped me to see them because they made it through, and I know that I can too."

Evaluation of Baseline Scores

There were no significant differences on any baseline variables by treatment group, grade or school. Thus, we combined the intervention and control groups across schools for the analysis.

Immediate/Intermediate Effects on Outcome Variables—Table 1 shows the means and standard deviations of stigma and literacy scores for the intervention and control groups at the different time points. Table 2 shows the results of regressing each scale on treatment group.

Mental illness stigma: Adjusting for baseline scores of mental illness stigma, level-of-contact, socioeconomic level, age, race, grade, adolescents in the intervention group did not experience a reduction in mental illness stigma immediately after the intervention (95% CI= -1.47-.49, $p=.33$). When these same covariates were included in the model and regressed on intermediate (4 and 8 weeks post-intervention) mental illness stigma, there was no significant difference between adolescents in the intervention and control groups (95% CI=

-1.67-.34, $p=.19$). The intervention did not have an intermediate effect on mental illness stigma.

Mental health literacy: Adjusting for baseline scores of mental health literacy, level-of-contact, socioeconomic level, age, race, grade, adolescents in the intervention group did not score significantly different than adolescents in the control group in mental health literacy immediately after the intervention (95% CI = -.76–2.68, $p=.27$). In other words, the intervention did not produce an immediate effect on mental health literacy. However, it appears the effect of the intervention was delayed. When these same covariates were included in the model and regressed on intermediate (4 and 8 weeks post intervention) mental health literacy, adolescents in the intervention group scored significantly higher on mental health literacy, (95% CI=.71–3.53, $p=.03$).

Discussion

This study examined the feasibility, acceptability, and efficacy of a widely used and existing community-based knowledge-contact intervention. Study findings support the feasibility of retaining adolescents over 10 weeks and administering the intervention to adolescents who enrolled in the study. The ability to enroll participants was less feasible. The requirement of parental consent was an artifact of the research process and needed to administer the intervention and collect outcome data. Given these study findings, we believe if *In Our Own Voice* was universally administered to adolescents as part of a school program, the program would likely be highly feasible to implement and acceptable to adolescents.

Although there was no immediate improvement in mental health literacy, the intervention was efficacious in improving mental health literacy intermediately at 4 and 8 weeks post intervention. We know from the work of Pescosolido (2009) that individuals with low mental health literacy have heightened sensitivity to information and images of mental illness found in media and television. Thus, for this study, we suspect that completing measures of mental illness stigma and mental health literacy may have heightened all participants' sensitivity to mental illness within their environment, especially through media and television (Pescosolido, 2009). This heightened sensitivity in the control group may have masked the immediate gain in mental health literacy attributed to the intervention. The control group experienced a comparable gain at T2, but this gain was not sustained, likely because they did not receive the intervention. Statistical significance was demonstrated intermediately because the intervention group retained this gain, as the control group's mental health literacy scores declined.

The intervention was not efficacious in reducing mental illness stigma. Examination of the confidence intervals, for the immediate and intermediate measures of mental illness stigma and mental health literacy, reveal that the majority of the confidence interval is on the desired side of zero—below zero for mental illness stigma and above zero for mental health literacy. Unfortunately, the current study was underpowered for using cluster randomization analytical techniques ($n=156$). As a result, the lack of statistical significance may be an artifact of the small sample size. The sample size required to adequately power the current study design was nearly $n=1000$, which was not feasible for this phase of the project. Future studies are being planned to overcome the issue of sample size.

Although there was an increase in mental health literacy at four and eight weeks, there was no reduction in mental illness stigma, and participants scored the *In Our Own Voice* presenters' stories and behaviors as inconsistent with previous stories they heard about mental illness and behaviors they have witnessed from individuals with mental illness; presenters may have disconfirmed participants' stereotypes about mental illness, but this

was not reflected by a decrease in mental illness stigma. Attitude research provides a plausible explanation for this finding. Research on attitudes shows attitudes are often emotional and implicit rather than logical (Petty et al., 1981; Zajonc, 1980). In this study, the change in mental health literacy without a concurrent change in mental illness stigma illustrates a potential disconnection between thoughts and feelings.

Findings of this study related to mental illness stigma are different from previous studies of *In Our Own Voice* with college age students. Our participants were younger and had less education than participants in other studies (Pittman et al., 2010; Rusch et al., 2008; Wood et al., 2006). It is possible that differences in study findings regarding stigma are related to the conceptualization of mental illness by participants. Specifically, the r-AQ items ask participants to respond a scenario regarding a student with “mental illness.” In short, participants may have operationalized the term “mental illness” differently, and may have thought about individuals with severe psychiatric illnesses like schizophrenia rather than individuals with less severe illnesses (Link et al., 1999). Mean baseline scores on mental health literacy for our study were slightly lower than those reported by Wood & Wahl (2006) and Pittman, Noh, & Coleman (2010). Measures of mental illness stigma cannot be compared across these studies because of differences in instruments.

Plausible differences in study findings between our study and others (Wood et al., 2006; Pittman et al., 2010) could be related to level of mental health knowledge, education level, type of education (students derived from psychopathology and psychology courses), socio-demographics, developmental stage, differences in the intervention administration and intervention content, reactivity to the experimental situation, and experimenter demand (Shaddish et al., 2002). Previous studies of *In Our Own Voice* have paid little attention to intervention fidelity and have utilized an immediate pre-and post-test design. Assessment and assurance of intervention fidelity is essential because it strengthens the internal validity of study findings (Leff et al., 2009). The intervention in this study had high fidelity. We overcame the threat to internal validity associated with repeated exposure to serial administration of these study questionnaires by evaluating participants at time longer time intervals to minimize the likelihood of response recall. For example, T1 and T2 were administered two weeks apart and T3 and T4 were four weeks apart. We know of no other study that has examined this intervention longitudinally in adolescents.

The findings of this study regarding mental illness stigma and mental health literacy are somewhat disappointing. It is possible the dose and duration of the intervention were inadequate. A brief one-hour intervention may be insufficient to produce meaningful changes in mental illness stigma and mental health literacy, which have likely developed beginning in childhood (Wahl et al., 2007). Thus, future studies should explore increasing the intervention dose and duration to promote sustained contact with *In Our Own Voice* presenters via electronic methods like video conferencing, social networking, twitter, blogs or sustainable collaborative activities in a classroom or community setting. Sustained contact with presenters will foster opportunities for adolescents to correct misconceptions about mental illness, obtain answers to further questions about mental illness, and integrate, by repeated exposure, new cognitive schemas about persons with mental illness.

Although this study provides new insight into a knowledge-contact intervention to reduce mental illness stigma and improve mental health literacy in adolescents, limitations include self-report measures, low reliabilities of the *In Our Own Voice* Knowledge Measure on the outcome variable that showed intermediate improvement, and the inability to account for intergroup group contact in the analysis, which could inflate intraclass correlations. In addition, we did not collection information about mental health service utilization, which is important for understanding the generalizability of study findings. Furthermore, we suspect

that this may potentially be a moderating variable. The response rate for this study was low, but comparable to other studies with adolescents that require parental consent (Rojas et al., 2008).

Despite these limitations, the present study employs a longitudinal design in a community-based sample of adolescent females in a naturalistic school setting. This study provides initial data on the feasibility, acceptability, and initial efficacy of mental health knowledge-contact interventions, which can be utilized to refine and further adapt knowledge-contact interventions for adolescents.

Acknowledgments

We would like to thank our community partners the National Alliance on Mental Illness-Tennessee, Jefferson County Public Schools, and Lisa and Michael Corbin. We would also like to thank Drs. Robert Topp, Paige Hertweck, and Peggy El-Mallakh for their thoughtful feedback on the project and Dr. Valerie McCarthy and Ms. Laura Flamini for assistance with data collection.

This study was funded by the Midwest Nursing Research Society Dissertation Research Grant and Sigma Theta Tau International, Iota Zeta Chapter.

This publication was made possible by Grant Number RR024990 from the National Center for Research Resources (NCRR), a component of the National Institutes of Health (NIH), and NIH Roadmap for Medical Research. Its contents are solely the responsibility of the authors and do not necessarily represent the official view of NCRR or NIH.

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Figure 1.

Table 1

Means and Standard Deviation of Outcome Variables

Outcome variable	T1 <i>M(SD)</i>	T2 <i>M(SD)</i>	T3 <i>M(SD)</i>	T4 <i>M(SD)</i>
Mental Illness Stigma				
Control	9.18(4.31)	9.67(4.46)	10.25(5.06)	10.40(5.02)
Intervention	9.13(3.69)	9.25(3.89)	9.45(3.95)	9.79(4.13)
Mental Health Literacy				
Control	61.84(6.44)	62.67(6.02)	61.84(7.86)	62.02(6.58)
Intervention	60.68(6.71)	62.65 (6.76)	62.85(6.72)	62.60(7.08)

Table 2

Regressions of Mental Illness Stigma and Mental Health Literacy on Treatment Group

Predictors	R ²	Adj. R ²	b	β	LL	UL	95% CI
Model 1 (DV=Mental Illness Stigma, Immediate)							
Baseline mental illness stigma score	.56**	.54**	.76**	.73**	.64	.88	
Level-of-Contact			-.07	.03	-.35	.22	
Socioeconomic level (subsidized vs. unsubsidized lunch)			.02	.01	-1.18	1.22	
Age (years)			.47	.08	-.54	1.5	
Race (white vs. non-white)			-.75	-.08	-2.01	.51	
Grade (9 th vs 10 th grade)			-.02	-.00	-1.49	1.45	
Group (intervention vs. control)			-.49	-.06	-1.47	.49	
Model 2 (DV=Mental Illness Stigma, Intermediate)							
Baseline mental illness stigma score	.60**	.57**	.82**	.75**	.70	.94	
Level-of-Contact			-.22	-.08	-.51	.08	
Socioeconomic level			.59	.06	-.64	1.82	
Age			.54	.08	-.49	1.57	
Race			-.25	-.03	-1.53	1.04	
Grade			-.30	-.03	-1.81	1.21	
Group			-.67	-.08	-1.67	.34	
Model 3 (DV=Mental Health Literacy, Immediate)							
Baseline mental health literacy score	.47**	.44**	.67**	.68**	.54	.79	
Level-of-Contact			.13	.03	-.37	.63	
Socioeconomic level			.60	.04	-1.50	2.69	
Age			.30	.03	-1.46	2.05	
Race			-1.49	-.10	-3.68	.70	
Grade			-.69	-.05	-3.26	1.88	
Group			.96	.07	-.76	2.68	

Predictors	R ²	Adj. R ²	b	β	95% CI	
					LL	UL
Model 4 (DV=Mental Health Literacy, Intermediate)	.51**	.48**				
Baseline mental health literacy score			.65**	.66**	.53	.77
Level-of-Contact			.54*	.14*	.05	1.04
Socioeconomic level			.91	.07	-1.14	2.97
Age			1.52	.16	-20	3.23
Race			-3.00**	-.21**	-5.14	-.86
Grade			-1.83	-.13	-4.36	.70
Group			1.85*	.14*	.17	3.53

Note. DV=dependent variable, CI=confidence interval for b; LL=lower limit, UL=upper limit

**
p ≤ .01

*
p ≤ .05