DIFFERENTIAL FACTORS INFLUENCING HISPANIC/LATINX ADOLESCENT ENGAGEMENT IN MIND-BODY SKILLS GROUPS FOR DEPRESSION

by

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ABSTRACT

Major Depressive Disorder is a prevalent and pervasive problem in the United States, and this mental disorder disproportionately affects adolescents of color. In particular, there is little research understanding how Hispanic/Latinx adolescents utilize and engage with mental health services, such as psychotherapy, to reduce their symptoms of depression, including factors that are positively and negatively related to engagement. As such, the aims of this study were to understand whether there were any relationships between presenting characteristics of adolescents seeking therapy for depression and their subsequent engagement with therapeutic services, with a focus on analyses examining trends in Hispanic/Latinx adolescents. To investigate these aims, we utilized data from a pilot study in which adolescents (n=42) received a mind-body intervention for depression called Mind-Body Skills Groups. We examined possible relationships between depression severity, age, Hispanic/Latinx background, and their interactions with engagement, as measured by attendance rates, self-reported motivation, and athome skills practice. We hypothesized that high depression severity, high age, and being Hispanic/Latinx would all negatively influence engagement; we also hypothesized the depression-engagement and age-engagement relationships would be moderated by Hispanic/Latinx background. Results revealed initial relationships between lower age and being Hispanic/Latinx with higher attendance rates; depression severity was not related to attendance. When these relationships were further analyzed using hierarchical regression, no significant relationships between predictor and outcomes variables, as well as their interactions, were discovered. In an exploratory analysis investigating factors of adolescent depression using subscales, greater interpersonal problems predicted higher attendance rates. Results are interpreted relative to limitations of the small sample size and possible measurement concerns within this study, including a discussion of possible ways to improve related studies on Hispanic/Latinx youth in the future.

CHAPTER 1. INTRODUCTION

Major Depressive Disorder (MDD) is the leading contributor of disability worldwide and a major contributor to death by suicide (James et al., 2018; WHO, 2017). Longitudinal data point to the chronic nature of this mental illness, showing that a majority of those who are diagnosed with depression in adolescence go on to experience at least 1 recurrent episode in adulthood (Clayborne, Varin, & Colman, 2019). In 2017, an estimated 13.3% of adolescents in the United States experienced a major depressive episode (SAMHSA, 2018a), and recent analysis of national data has also shown that rates of adolescent depression are rising (Mojtabai, Olfson, & Han, 2016; Twenge, Joiner, Rogers, & Martin, 2018). These trends are particularly concerning because depression is associated with significant sources of morbidity and mortality in adolescents, such as anxiety, substance abuse, and suicidal behavior (Thapar, Collishaw, Pine, & Thapar, 2012). Research has also shown that depression can have negative lifelong consequences, with worse outcomes for individuals who were diagnosed earlier in life (Rohde, Lewinsohn, Klein, Seeley, & Gau, 2013). Even more concerning is that particular ethnic groups, such as Hispanic/Latinx adolescents, show increased rates of depression diagnoses and are less likely to receive mental health treatment compared to Non-Hispanic/Latinx youth (Merikangas et al., 2010, 2011). Because Hispanics/Latinxs represent one of the fastest growing demographic groups in the United States (Ennis, Ríos-Vargas, & Albert, 2010), it is particularly important to ensure that current interventions for MDD are poised to meet the unique needs of these cultural groups as a form of early prevention and intervention.

In the current study, we were interested in examining adolescent engagement with a psychotherapeutic intervention for depression, called Mind-Body Skills Groups (MBSGs), with close consideration of Hispanic/Latinx adolescents. We accomplished this by examining factors predicting engagement to this intervention, focusing on depression severity and age, with the idea this would inform future research on engaging adolescents in similar interventions. We also explored the impact that Hispanic/Latinx background, as a direct predictor and moderator, may have on these relationships to further investigate whether this intervention was comparatively engaging for Hispanic/Latinx adolescents specifically. Below, we reviewed current literature on factors relating to adolescent engagement in existing interventions for depression and how these relationships may be relevant to developing and providing new treatments for this population.

1.1 Current Interventions for Major Depressive Disorder

Currently, evidence-based treatments for adolescents with MDD consist of some form of psychotherapy, medication, or a combination of the two (Cheung et al., 2007; Lewandowski et al., 2013; Zuckerbrot, Cheung, Jensen, Stein, & Laraque, 2018). Although studies have shown that all of these interventions are similarly effective in ameliorating symptoms of depression (Blom et al., 2007; De Maat, Dekker, Schoevers, & De Jonghe, 2006), we focus on psychotherapeutic interventions for a few reasons. First, research efforts have consistently shown that the effects of these interventions are longer lasting and more cost-effective (De Maat et al., 2006; Dobson et al., 2008; Murphy, Carney, Knesevich, Wetzel, & Whitworth, 1995). Second, they may also be preferred by adolescents and their parents/guardians due to higher risks associated with some forms of antidepressant medications, such as increased suicidality (Brent, 2004). Third, psychotherapy for MDD has an extensive evidence base supporting its therapeutic benefits (Barth et al., 2016; Cuijpers, van Straten, Andersson, & van Oppen, 2008; Weisz, McCarty, & Valeri, 2006). This evidence base extends over a large number of different modalities of therapy, which can be differentially effective due to a variety of client and therapist factors such as symptom presentation, client preference, cultural factors, delivery format, and therapeutic alliance (Barth et al., 2016; Cuijpers et al., 2008; Horvath & Luborsky, 1993; Kwan, Dimidjian, & Rizvi, 2010; Jeannette Rosselló, Bernal, & Rivera-Medina, 2008; Weisz et al., 2006). As a result, the high amount of variability in types of psychotherapies available allows for more individualized treatment tailoring, making it a promising research topic to pursue. A commonality across all forms of psychotherapy is that they necessitate active client involvement for interventions to be effective (Bolton Oetzel & Scherer, 2003; Constantino, Castonguay, Zack, & DeGeorge, 2010). In fact, some have directly linked higher client engagement (e.g., client participation and involvement) to the enduring effects of psychotherapy – this suggests that elements of client involvement and participation may be a key facilitators for observed lasting improvements over time (Kazantzis et al., 2018).

Recent research efforts have begun to assess how impactful certain psychotherapies can be in the context of depressive disorders specifically, given that 1) symptoms of depression can discourage engagement (Kwan et al., 2010) and 2) a wide array of external factors, such as cultural factors, can also influence engagement (Ilardi & Kaslow, 2009). Given the importance of engagement in psychotherapeutic interventions, these barriers may be a great cause for concern

in depressed populations. Further, these factors are especially important to study in adolescent populations due to the fact that adolescents have limited autonomy in their ability to engage with psychotherapy (Church, 1994) and comprise a population that is at an especially elevated risk to develop MDD (SAMHSA, 2018). As a result, there is a need to understand how well adolescents engage with psychotherapy to be able to determine how helpful these services may be in alleviating symptoms of depression.

1.2 Measuring Engagement: Dose Effect Model

Engagement in psychotherapy can be broadly defined as any type of effort that a client makes during the course of treatment to achieve positive change (Holdsworth, Bowen, Brown, & Howat, 2014). Given this broad definition and inherent difficulties in measuring such a subjective construct, researchers have measured engagement through many means such as dropout rates, motivation, therapeutic alliance, participation, homework completion, and attendance (Bachelor, 2013; Dingle, Gleadhill, & Baker, 2008; Dowling & Cosic, 2011; Frei & Peters, 2012; James et al., 2018; LeBeau, Davies, Culver, & Craske, 2013). Meta-analytic work has shown that there are substantial methodological problems and little consensus regarding the measurement of engagement in psychotherapy, prompting a push for research and quantitative models that can directly relate engagement with therapeutic outcome (Shirk & Karver, 2003).

Some have turned to a dose-effect quantitative model, an adapted model from pharmacological work, which relates the overall effect of an intervention to the "dose" received (Howard, Kopta, Krause, & Orlinsky, 1986). When adapted to psychotherapy, the "dose" translates to the overall engagement of the client in therapy with the idea that higher levels of engagement lead to a higher "dose" of intervention received, which will result in the intended positive therapeutic outcomes. This model also suggests that lesser levels of engagement may prove to be insufficient for a positive therapeutic outcome (Howard et al., 1986). The usage of this conceptual model allows for one to consider that 1) different types of interventions may have different "doses" that are sufficient for a positive therapeutic effect and 2) factors, such as racial/ethnic background, sexual identity, and age, that influence engagement may have a strong effect on therapeutic outcome (Bolton Oetzel & Scherer, 2003; Comas-Díaz, 2007; Felton, 1986). Further, interactions between intervention type and factors that influence engagement may suggest that group differences exist for the ideal "dose" required for any given intervention.

Most research utilizing this model has operationalized engagement by linking it to the number of sessions attended by a client – attendance – as this type of variable has been argued to be more objective, easily collected, and amenable to a quantitative model compared to other measures of engagement (Salzer, Bickman, & Lambert, 1999; Shapiro, Hardy, Reynolds, Barkham, & Rees, 1996; Stulz, Lutz, Kopta, Minami, & Saunders, 2013). Indeed – in adult populations with depression, higher levels of therapeutic session attendance has been linked to greater levels of improvement and has typically been studied in dose-effect frameworks (Barkham, Rees, Stiles, Hardy, & Shapiro, 2002; Kadera, Lambert, & Andrews, 1996; Shapiro et al., 1996; Stulz et al., 2013). Given the empirical support found for using attendance as a proxy for engagement, we utilized attendance as our primary engagement outcome measure in the current study and reviewed existing literature examining relationships with this variable. We also reviewed additional engagement outcome measures as a means of more fully characterizing this construct, especially given how broadly engagement can be defined. For example, higher levels of motivation and homework completion, additional proxy metrics for engagement, have also been shown to be linked to positive therapeutic outcomes in depressed adult populations (Keithly, Samples, & Strupp, 1980; Rees, McEvoy, & Nathan, 2005; Zuroff et al., 2007). These metrics may be particularly helpful to examine, since motivation and at-home practice may be more reflective of active, adolescent "efforts in therapy" - attendance may not always be related to active "effort," especially for adolescents, who have less control over attendance than adults (Bolton Oetzel & Scherer, 2003; Holdsworth, Bowen, Brown, & Howat, 2014).

1.3 Engagement and Therapeutic Outcome for Adolescents

The adult therapeutic process and outcome literature has consistently shown that the quality of patient involvement in therapy is one of the most important determinants of therapeutic outcome (Orlinsky, Grawe, & Parks, 1994). In fact, even after controlling for factors such as therapist warmth and friendliness, this finding has endured (Constantino et al., 2010; Gomes-Schwartz, 1978; Moras & Strupp, 1982; Strupp, 1993). Although less studied, these findings have also been replicated in adolescent cohorts where willingness to participate and actual participation itself have been linked to positive treatment outcomes (Karver, Handelsman, Fields, & Bickman, 2006). Meta-analyses have revealed a small, consistent association (r = .27) between these participation-related variables and treatment outcomes for adolescents (Shirk &

¹²

Karver, 2003), which has been shown to be similar in size to trends observed in adult populations (Horvath & Symonds, 1991; Martin, Garske, & Katherine Davis, 2000). The literature on the specific relationship between adolescent attendance to psychotherapy and treatment outcome is mixed. This may be due to the fact that adolescents rarely refer themselves for treatment – usually a caretaker takes a key role in the initiation of treatment. For example, one study found no relationship between adolescent therapy attendance and outcome across a variety of conditions (Andrade, Lambert, & Bickman, 2000). Because many different factors can moderate and mediate attendance across conditions and contexts, research efforts have begun assessing the relationship between attendance rates and additional specific factors, such as age, ethnicity, sexual identity, socioeconomic status, insurance status, and transportation capabilities (Bolton Oetzel & Scherer, 2003; Holdsworth et al., 2014; O'Keeffe et al., 2018; Wilson & Deane, 2001). Assessing for these factors allows for researchers to consider potential barriers and confounds to engagement with therapy – controlling for and considering these confounds may help future research efforts better characterize the relationship between attendance and therapeutic outcome as well as other measures of engagement.

1.4 Depression and Engagement

Symptoms of depression such as anhedonia, depressed mood/hopelessness, low energy, concentration difficulties, and excessive guilt become salient as potential barriers to allowing an adolescent to fully engage with treatment. Given the chronic nature of depression and the consistency of depressive symptomatology across the lifetime (Kandel & Davies, 1986), we briefly discuss important findings from research on adult populations to highlight our expected relationships between engagement and depressive symptoms. Research on adult populations have shown that primary care clients most frequently cited depression symptoms as being related to barriers to both receiving and seeking out treatment, with an emphasis on perceived stigma (Mohr et al., 2010). It has even been shown that client self-reported negative mood on the day prior to a therapy session significantly predicted lack of attendance, while positive mood related to a greater likelihood of attendance (Bruehlman-Senecal, Aguilera, & Schueller, 2017). Further, a recent study showed that interactions between attendance and depression severity further predicts subsequent service use, demonstrating the highly related nature of depression severity and service utilization (Reeder, Park, & Chorpita, 2020). Common explanations for these

observed trends are that decreased motivation associated with depression may reduce helpseeking behaviors and that increased negative biases that come from depression may cause clients to overestimate the impact of different barriers, such as cost and transportation (Kwan et al., 2010; Wilansky-Traynor et al., 2010). Although research on adolescent depression in this domain is sparse, existing studies show similar trends: a study assessing attendance to psychotherapy by depressed and anxious teens found that adolescents with less depression and anxiety symptoms attended sessions more consistently (Pellerin, Costa, Weems, & Dalton, 2010; Wilansky-Traynor et al., 2010). Additionally, studies have shown that higher levels of adolescent depression are linked to decreased motivation for change and less adherence to homework completion (Forbes & Dahl, 2005; Jungbluth & Shirk, 2013; Simons et al., 2012), highlighting the impact that symptoms of depression can have on multiple levels of engagement in therapy. In the current study, we examined depression as a predictor of engagement to determine the extent to which MBSGs are engaging across differing depression levels. Given the dearth of research on the relationship between adolescent engagement and depression, we were also interested in exploring whether specific symptoms or facets of adolescent depression impact this relationship. These types of exploratory analyses may be instrumental in further understanding whether specific factors or elements of adolescent depression are critically important to target in future intervention or engagement research.

1.5 Age and Engagement

Adolescence presents a paradoxical time where individuals begin to gain more freedom yet are still dependent on their caretakers for basic needs, such as food, shelter, healthcare, and transportation. This paradox may also make treatment engagement for adolescents especially difficult: there can be differences between child and parent motivations, perceptions of issues, and willingness to commit to therapy (Bolton Oetzel & Scherer, 2003). Further, in situations where an adolescent does attend psychotherapy, they still face typical barriers to engaging with psychotherapy such as social stigma and distrust of health professionals (Bolton Oetzel & Scherer, 2003). These combined factors may severely lessen adolescent motivation to engage with psychotherapy, potentially negatively impacting therapeutic outcomes (Church, 1994). Research specifically relating attendance to age has found that younger adolescents are more likely to attend psychotherapy than older adolescents (Piacentini et al., 1995; Wilansky-Traynor

et al., 2010). In addition, younger clients have been shown to be more likely to complete treatment-related homework, while older adolescents may be less compliant with homework completion, especially when the assignments are overly simplistic (Hudson & Kendall, 2002). Motivation for change, as another form of engagement, is particularly difficult to study in adolescents given the highly involved role parents/guardians have in their health care, making it difficult to disentangle where the "true" motivation for change lies. However, it has been shown that exploring adolescent motivation in therapy is highly linked to more positive therapeutic outcomes, highlighting the importance of adolescent motivation in psychotherapy (Church, 1994; Jungbluth & Shirk, 2013). As a result, it becomes particularly important to assess how well an intervention engages teenagers across a range of ages because of these existing trends. In the current study, we examined age as a predictor of engagement to determine how engaging MBSGs are for both older and younger adolescents.

1.6 Ethnicity and Engagement

Both adult and adolescent research has shown that cultural factors play a key role in the therapeutic relationship and can, as an extension, impact engagement with psychotherapy (Comas-Díaz, 2007; Hall, Ibaraki, Huang, Marti, & Stice, 2016; J Rosselló & Bernal, 1999; Jeannette Rosselló et al., 2008; Sanchez, Killian, Eghaneyan, Cabassa, & Trivedi, 2019). Specific research examining the relationship between ethnic/racial background and attendance rates is sparse, but existing trends indicate that ethnic/racial minority groups have lower attendance rates to psychotherapy compared to White populations (Aggarwal et al., 2016; Kivlighan, Jung, Berkowitz, Hammer, & Collins, 2019). It is also well-known that ethnic/racial minority clients underutilize a variety of health services, especially mental health services, (Miranda, Azocar, Organista, Muñoz, & Lieberman, 1996; Thompson, Bazile, & Akbar, 2004), and this effect has also been shown in adolescent cohorts (Miller, Southam-Gerow, & Allin, 2008). Qualitative research has pointed to beliefs that mental health systems do not adequately address diverse clients' perception of illness, stigma, language barriers, and mismatched communication styles as potential explanations for these findings, which can certainly impact motivation to engage with these health systems (Menke & Flynn, 2009; Sanchez et al., 2019). Even further, recent studies have shown that certain ethnic/racial groups may be less likely to perceive a need for treatment (Green et al., 2020), which may help further characterize the

underutilization of health services by these populations. Most studies that investigate these trends in racial/ethnic minority groups are underpowered and lack the ability to look at specific subgroups.

Targeted research on maximizing Hispanic/Latinx engagement in psychotherapy is in its infancy (Sanchez et al., 2019), and this is especially true for adolescents. As noted before, Hispanic/Latinx adolescents are more likely to be depressed yet less likely to receive treatment, which constitutes a critical gap in the literature (Merikangas et al., 2010, 2011). Preliminary research in culturally sensitive interventions for depressed Hispanic/Latinx adolescents has identified this culture's embrace of collectivist ideologies and togetherness –called *familismo* – as a promising avenue for further study (Arredondo & Perez, 2003; Jeannette Rosselló et al., 2008). Core themes from this research are that group therapy and interventions that are less cognitively-focused may be especially salient to Hispanic/Latinx populations due to potential resonances with deeply held values of this culture, helping facilitate engagement (Edwards, Adams, Waldo, Hadfield, & Biegel, 2014; Sanchez et al., 2019). Given the overarching theme that ethnic/racial minority clients underutilize health care services, in the current study, we were interested in exploring the extent to which Hispanic/Latinx background directly predicts engagement.

Studies assessing Hispanic/Latinx background as a moderator are sparse but tend to suggest that this is an especially difficult population to engage in the context of depression. Research examining depressed Hispanic/Latinx adult engagement with health services have focused on how stigma in this community is linked to decreased help-seeking behaviors and decreased engagement with health services (Caplan & Whittemore, 2013; Nadeem et al., 2007; Vega, Rodriguez, & Ang, 2010). Some studies have suggested that this stigma is the result of cultural indifference from traditional, older family members and religious leaders towards mental illness (Caplan & Whittemore, 2013). This lack of responsiveness from respected members of the community undermines the seriousness of mental health issues and may directly increase stigma for those who do seek help. Indeed, studies have shown that Hispanic/Latinx adults with higher levels of perceived stigma were less likely to disclose their depression to family and friends, less likely to take depression medication, and, importantly for the current study, more likely to miss scheduled mental health appointment visits (Vega et al., 2010). Although we do not have measures of stigma in the current study, it is possible that Hispanic/Latinx background

may interact with depression severity in a similar way. This is due to the fact that decreased helpseeking behaviors may lead to decreased help received and higher symptoms of untreated depression. Given the emphasis that Hispanic/Latinx culture places on collectivism and *familismo*, we expected that the family unit will perpetuate and facilitate stigma for younger family members as well. As a result, in the current study, we examined the role that Hispanic/Latinx background may play as a moderator between depressive symptoms and engagement in psychotherapy.

There is also reason to believe that Hispanic/Latinx background would interact with age in predicting treatment engagement. Given the role of parents in health care decisions for this population, the literature on parenting styles may be informative for more fully understanding this interaction. Research has identified differences in Hispanic/Latinx parenting styles such that Hispanic/Latinx parents tend to be authoritative – showing high levels of both support and control – while White parents tend to be permissive – showing high levels of support but low levels of control (Driscoll, Russell, & Crockett, 2008). This is important because these differences may create differential feelings of autonomy that children have in their healthcare; if Hispanic/Latinx adolescents feel more pressured into therapy, will they be less likely to truly engage and benefit? When one considers that Hispanic/Latinx culture strongly emphasizes obedience and deference to parents as a form of respect (Arcia & Johnson, 1998), this situation becomes much more likely – despite growing older and progressing through adolescence, these youth may still tend to defer to their parents' wishes. This dynamic has the potential to severely undermine Hispanic/Latinx adolescents' feelings of autonomy, which has been linked to fully engaging with and benefiting from psychotherapy (Church, 1994). Thus, we examined whether Hispanic/Latinx background would interact with age in predicting engagement.

1.7 The Current Study – Mind-Body Skills Groups (MBSGs)

The current study took place within the context of a larger study testing the feasibility, acceptability, and preliminary effectiveness of a novel mind-body modality (MBM) intervention for adolescents with depression in a primary care setting called the Mind-Body Skills Groups (MBSGs). MBMs, as a whole, facilitate the awareness of present experiences on a moment to moment basis – stressing the connection between being mindful and positive mental health (D'Silva, Poscablo, Habousha, Kogan, & Kligler, 2012). These types of interventions have been

effective at reducing adolescent depressive symptoms in a variety of contexts and conditions (Dunning et al., 2019; Klingbeil et al., 2017; Maynard, Solis, Miller, & Brendel, 2017; Zenner, Herrnleben-Kurz, & Walach, 2014; Zoogman, Goldberg, Hoyt, & Miller, 2015). A study that utilized an MBM for adolescents diagnosed with depression found that they also indicated high satisfaction with the intervention, providing some initial evidence for how engaging these interventions may be (Ames, Richardson, Payne, Smith, & Leigh, 2014). MBMs might be a particularly useful treatment modality for teens because they are frequently delivered in a group format. Social support has a strong association with the absence of depression symptoms (Gariépy, Honkaniemi, & Quesnel-Vallée, 2016), and group therapy has been shown to facilitate these social connections for adolescents (Nardi, Massei, Arimatea, & Moltedo-Perfetti, 2017). In addition, MBMs typically have lower session numbers compared to other interventions and allow for greater personalization of content, aspects that can both help facilitate greater engagement with these interventions (D'Silva et al., 2012). Research on the usage of MBMs for underserved populations is limited and work is needed to understand how subgroups of adolescents might best engage in this type of care. However, preliminary evidence has demonstrated the acceptability and feasibility of MBMs for Hispanic/Latinx youth at risk of depression (Young, Minami, Aguilar, & Brown, 2018).

1.8 The Current Study – Specific Aims and Hypotheses

In summary, there is a lack of research that examines factors related to adolescent engagement in psychotherapy for depression in general, with even less research on Hispanic/Latinx groups. Existing research in this domain is mostly focused on White populations and utilizes a narrow range of interventions, suggesting a need for research on alternate interventions in diverse groups. In the context of a mind-body intervention for adolescents with depression, we were interested in examining factors predicting engagement to this intervention, focusing on main effects of depressive symptoms, age, and Hispanic/Latinx background and any interactive effects with Hispanic/Latinx background. We utilized attendance as our primary outcome measure for engagement in addition to other indicators available in the parent study, namely motivation levels and homework completion rates. We have three specific aims within this study (see Table 1 for associated specific hypotheses). In our first specific aim, we examined the independent contributions of depression severity, age, and ethnic background as predictors of engagement. We hypothesized that global depression scores at baseline would be negatively related to engagement measures; that is, participants with higher levels of depression would be less likely to attend groups, more likely to report low motivation, and be less likely to practice MBSGs skills at home. We also hypothesized that age at baseline would be negatively related to engagement measures; that is, older adolescents would be less likely to attend groups, more likely to report low motivation, and be less likely to practice MBSGs skills at home. Finally, we hypothesized that Hispanic/Latinx participants would be less likely to engage with the intervention compared to Non-Hispanic/Latinx participants; that is, Hispanic/Latinx participants would be less likely to attend groups, more likely to report low motivation, and be less likely to practice MBSGs skills at home. In our second specific aim, we examined the degree to which ethnic background acted as a moderator for the other utilized predictors – depression severity and age – for engagement. We hypothesized that 1.) depression negatively impacted engagement measures, and this would be especially true for Hispanic/Latinx participants and 2.) age negatively impacted engagement measures, but this would be less true for Hispanic/Latinx participants. In our third specific aim, we explored whether specific factors of adolescent depression differentially predict engagement measures utilizing the same models above but with appropriate corrections for multiple statistical tests. This exploratory aim utilized adolescent depression factors as defined by the Children's Depression Inventory-2 (Kovacs & MHS Staff, 2011), a validated measure for adolescent depression.

CHAPTER 2. METHODS

2.1 Study Overview

As part of a system-wide emphasis on well-being for staff and patients, an urban hospital system in central Indiana partnered with the Center for Mind-Body Medicine (CMBM) to implement MBSGs for staff and patients. The project included a pilot study to examine the feasibility and acceptability of implementing these groups in a primary care setting for adolescents with depression (Aalsma et al., 2020). This study involved data collection from participants who completed the groups at 3 timepoints: baseline, post-treatment, and 3 months post-treatment. This project was approved by Indiana University's Institutional Review Board as well as the participating hospital system's research committee. The current study is a secondary analysis of collected data from this primary dataset focusing on the relationship between depression severity and age with engagement with the MBSGs, with an emphasis on Hispanic/Latinx populations.

Only a subset of the collected data from the parent study was used for the current study, consisting of demographic information, depression severity, attendance rates, self-reported motivation, and at-home practice rates. Data from the first timepoint in the study were used as independent variables, while data from the second timepoint were utilized as dependent variables because of hypothesized temporal relationships between baseline characteristics of depression, age, and Hispanic/Latinx background with subsequent engagement with the intervention (See Figure 1). As detailed below, attendance data was collected throughout the intervention, while self-reported motivation and home practice were collected immediately post treatment.

2.2 Recruitment Procedures

Adolescent participants were recruited by behavioral health clinicians from three primary care clinics in an urban county hospital system in central Indiana. Eligible participants were first identified and approached by clinicians who provided them with information regarding the study. If a participant expressed interest, clinicians provided contact information to a research assistant who later contacted the adolescent and their parent via telephone to schedule a screening appointment. After completing the informed consent and assent process, eligibility was assessed,

and, if eligible, baseline measures were collected. Demographic and contact information were also collected at this time. Eligibility criteria required that the adolescent 1) screened positive for depression using the Mini-International Neuropsychiatric Interview for Children and Adolescents (MINI-KID) (Duncan et al., 2018) 2) was a primary care patient of the participating hospital system, 3) was between the age of 13 and 17 at the time of screening, 4) spoke English, and 5) was willing to attend the MBSGs for 10 weeks. Adolescents were excluded from participation if they 1) had a history of bipolar or psychosis, 2) were at an acute and immediate risk for suicide at the time of screening, 3) were incapable of providing assent or parent was unwilling to consent, or 4) had previously participated in the MBSG prior to the study.

A total of 49 participants were screened for the parent study. Per exclusion criteria, 2 participants were screened out for not meeting a diagnosis of Major Depressive Disorder as determined by the MINI-KID. For the current analysis, an additional 5 participants were excluded for not indicating or missing necessary data (1 participant did not indicate an ethnicity and 4 participants did not attend a single group session). We excluded participants who did not attend a single session because they did not have an opportunity to engage with the intervention at all – as a result, their reasons for disengagement are likely different from participants who had some exposure to the intervention. In addition, these participants did not have data for any of the post-intervention engagement measures, making their data unusable for most analyses. Further, 4 additional participants provided attendance data for the intervention but did not complete post-intervention research visits; as a result, data from 42 participants were available for analyses involving attendance rates, and data from 38 participants were available for analyses involving self-reported motivation and at-home practice rates.

2.3 Mind-Body Skills Intervention Group

The CMBM (Gordon & Kimmel, 2006) has developed a comprehensive intervention that integrates different elements of various MBMs through a number of different techniques designed to help release tension and express one's feelings and thoughts. This intervention, called Mind-Body Skills Groups, utilizes strengths of well-studied MBMs by integrating mindfulness techniques into daily activities, providing participants a platform to become aware of negative thoughts on a moment to moment basis (Carmody, Baer, Lykins, & Olendzki, 2009; Coffman, Dimidjian, & Baer, 2015). MBSGs build upon strengths of existing MBMs by

encouraging participants to express their individuality by choosing which skills are most relevant and helpful to their experiences rather than adhering to set techniques (Gordon & Kimmel, 2006). By following this format, CMBM is able to utilize multiple types of modalities in one integrated model that allows for personalized treatment. The CMBM model has been shown to be effective in reducing symptoms of PTSD and depression in war-traumatized children and adolescents from Kosovo and Gaza (Gordon, Staples, Blyta, Bytyqi, & Wilson, 2008; Staples, Abdel Atti, & Gordon, 2011). These findings suggest that this model may be well-received and culturally sensitive.

The Mind-Body Skills Groups intervention was provided in a group format with up to 12 participants in each group. Groups were facilitated by two behavioral health clinicians who had been trained by facilitations from the Center for Mind-Body Medicine. Groups began as soon as the necessary number of subjects were enrolled. Participants were allowed to join a group as long as all screening and recruitment procedures were completed prior to the beginning of the second session. The group consisted of a total of ten sessions over ten weeks, which met for approximately 1.5 hours on the same day of each week.

2.4 Study Procedures and Baseline/Post-Intervention Research Visits

Following the completion of the intervention, a research assistant contacted the adolescent and their parent via telephone to schedule appointments for the second and third research visits. Adolescents were compensated for attending each MBSG session (\$10 per session), for completing the screen/baseline process (\$60), and for completing the 2 post-intervention followups (\$40 each). Additionally, adolescents were eligible, via a raffle system, each session to win a \$5, \$10, or a \$50 gift card for attending and practicing MBSG techniques outside of the group setting.

2.5 Measures

Baseline measures included demographics and depression severity. Engagement outcomes included attendance, self-reported motivation, and at-home homework practice rates collected at follow-up as described below.

2.5.1 Demographics

Participant demographics, including age, race, and ethnicity, were collected during the screening appointment and via a self-report questionnaire. Ethnicity was coded as a dichotomous categorical variable, with 0 indicating Non-Hispanic/Latinx and 1 indicating Hispanic/Latinx.

2.5.2 Depression Severity

Depression severity was measured using the Children's Depression Inventory (CDI-2), a 28-item assessment of depression in which each item ranges from 0 (no depressive symptom) to 2 (severe depressive symptom) and all items are summed to calculate a global score (Kovacs & MHS Staff, 2011). The CDI-2 instrument has two primary indices that measure symptoms of emotional problems and functional problems, and four subscale items (2 for each index) that measure symptoms of negative mood/physical symptoms, negative self-esteem, interpersonal problems, and ineffectiveness. Once the global score is calculated, it is transformed into a T-score which is used to determine depression elevation. A T-score \geq 70 is considered very elevated, scores between 69 - 65 indicate elevated, scores 64 - 60 indicate high average, and scores between 40 - 59 are considered average or lower. Prior studies have demonstrated good internal consistency of the CDI-2 (Cronbach $\alpha = .67-.91$) and measures of test-retest reliability and construct validity are adequate (Bae, 2012). For the purposes of the current study, we used a global score as an estimate for depression elevation for our primary hypothesis testing. However, we explored the subscales in an effort to more fully understand whether any aspects of adolescent depression differentially related to engagement.

Among our sample, the CDI-2 total score (28 items) showed good reliability (Cronbach's $\alpha = .81$). However, only one subscale showed good reliability – negative self-esteem (6 items; Cronbach's $\alpha = .83$). Reliability was low for the other symptom subscales: negative mood/physical symptoms (9 items; Cronbach's $\alpha = .57$), ineffectiveness (8 items; Cronbach's $\alpha = .55$), and interpersonal problems (5 items; Cronbach's $\alpha = .39$). The final two indices had acceptable reliability: emotional problems (15 items; Cronbach's $\alpha = .72$) and functional problems (13 items; Cronbach's $\alpha = .68$).

2.5.3 Attendance Rates

Research staff logged attendance to group every week by each participant. If a participant attended at least half of a particular session (more than 45 minutes), the participant was counted as having attended that session. Attendance rates were then summed and calculated with respect to the total number of groups participants could have possibly attended, providing flexibility for late entries into the study. That is, recruitment extended beyond the start of a group and some participants began the study after the first intervention group.

2.5.4 Self-Reported Motivation and Skills Practice at Home

For additional measures of engagement, we examined specific items on an acceptability measure the research team developed to assess adolescent's thoughts regarding the usefulness of the MBSGs. This survey was administered post-intervention and 3 months post-intervention; however, we used only the post-intervention assessments as it is most proximal to the end of the intervention. The first section of the survey consisted of 7 items that were rated on a 5-point Likert scale (1 = do not agree; 5 = completely agree), and included the following questions: (1) the MBSGs were useful, (2) I had to force myself to attend the MBSGs, (3) I apply what I learned in my everyday life, (4) the MBSGs were enjoyable, (5) I would recommend the MBSGs to others, (6) I am certain I will benefit from the skills I learned in the long run, (7) my group facilitators were understanding. From this section, responses to question 2 (reverse-coded so that higher numbers indicated greater motivation) were used as a proxy for the motivation level of the adolescent during the intervention.

The last section collected qualitative data in which participants were asked 5 open-ended questions regarding their experience in the MBSGs. Questions included: (1) Did the Mind-Body Skills Group help you? If so, how? (2) Is there anything you didn't like about the Mind-Body Skills Groups? If so, please explain, (3) What was the most important and interesting part of the group? Why? (4) If you practiced these skills at home, which ones did you practice the most and what did you like about them? and (5) Has your life or your outlook on the world changed because of the group? If so, how? From this section, responses to question 4 were used as a proxy for homework completion during the intervention. We qualitatively coded the data to create a dichotomous Yes/No variable for self-reported practice. Qualitative coding was verified

via inter-rater agreement and consensus with an additional research assistant. Examples of this questionnaire can be found in the Appendix. However, following qualitative coding of the athome practice rates into a dichotomous variable (0=did not practice skills, 1=practiced skills), we found that groups were too imbalanced for statistical analysis. Only 2 participants out of the 38 for this analysis indicated that they did not practice skills at home. As such, we dropped all analyses involving this variable beyond the sample description.

2.6 Analysis

2.6.1 Data Analysis

Data were analyzed utilizing the Statistical Package for Social Sciences (SPSS, IBM Corp., Software Version 27.0). Descriptive statistics were examined to check that all data met the minimum statistical assumptions for parametric tests and were normally distributed. A correlation matrix was run between variables of interest to assess zero-order relationships. However, because there were several predictor variables (depression severity, age, Hispanic/Latinx status), the primary hypotheses were tested with multiple regression to examine the independent contributions of each. Continuous predictor variables (depression severity and age) were centered prior to regression analyses by subtracting the mean from every individual value to make regression coefficients more interpretable (Echambadi & Hess, 2007).

In order to test our aims, we utilized two hierarchical regression models that were capable of examining Aim 1 in the first step and Aim 2 in the second step (Figure 2). First, we examined the degree to which depression symptom severity, age, and Hispanic/Latinx background predicted the remaining two engagement measures in separate regressions for attendance rates and motivation levels. The predictor variables were entered in the first step into a simple regression model predicting the given outcome variable (Aim 1). To examine whether Hispanic/Latinx background moderated the relationships between depression, age, and engagement measures (Aim 2), we calculated interaction terms between depression and Hispanic/Latinx background and age and Hispanic/Latinx background and entered these terms in a second step. If moderation was present, we examined the conditional effects of both depression and age at different values of the moderator to explore these effects more fully (e.g., one standard deviation above and below the mean). Overall, this yielded two hierarchical regression

models – one for each engagement measure (Figure 3). We conducted subscale analyses where we reran the depression subscales through the same hierarchical regression models in an effort to explore whether specific aspects of depression drove any observed trends; we made statistical corrections using the Benjamini-Hochberg procedure for this subset of multiple analyses. This type of statistical correction controls the false discovery rate – the expected proportion of falsely rejected hypotheses – which maximizes power while still accounting for multiple comparisons (Benjamini & Hochberg, 1995; Thissen, Steinberg, & Kuang, 2002). An FDR of .10 is consistent with frequently used parameters for these types of corrections (Benjamini & Hochberg, 1995; Thissen et al., 2002).

2.6.2 Power Analyses

To determine whether the current study's sample of 42 participants were sufficient to detect significant main effects (Aim 1), we conducted an a priori power analysis using G*power (Faul, Erdfelder, Lang, & Buchner, 2007) for multiple linear regression, fixed model, R² deviation from 0. The 3 total predictors utilized in step one of the models included depression severity, age, and Hispanic/Latinx background. Given our sample size of 42, power of .80, and alpha of .05, the current study was powered to detect a small to medium effect (Cohen's f² = .29). For analyses with a sample size of 38 (outcome variable: motivation), power of .80, and alpha of .05, the current study was powered to detect a medium effect (Cohen's $f^2 = .32$). Similarly, we conducted an a priori power analysis for moderation effects (Aim 2). The 5 total predictors utilized in step two of the models included depression severity, age, Hispanic/Latinx background, depression severity – Hispanic/Latinx background interaction, and age – Hispanic/Latinx background interaction. Given our sample size of 42, power of .80, and alpha of .05, the current study was powered to detect a medium to large effect (Cohen's $f^2 = .36$). For analyses with a sample size of 38, power of .80, and alpha of .05, the current study was powered to detect a medium to large effect (Cohen's $f^2 = .40$). We interpreted results in light of these findings.

CHAPTER 3. RESULTS

3.1 Sample Description

The final sample of 42 participants was primarily female (79%), Hispanic/Latinx (69%), and most were in Junior High School (57%; mean age =15 years, 3 months). For analyses that utilized post-intervention (Visit 2) data, the sample was further reduced to 38 participants for comparisons involving self-reported motivation or at-home practice as outcomes, as not all participants completed post-intervention questionnaires. Given the already small sample size of included subjects, we did not complete a dropout comparison for the 4 participants who did not provide post-intervention data, as these groups would be too small to reasonably compare (van Smeden et al., 2019) See Table 2 for participant characteristics.

3.2 Descriptive Statistics and Correlations

The mean depression severity for participants in the current study was in the very elevated range (raw score mean=26.62, SD=7.39; T-score mean=75.19, SD=9.69). See Table 3 for additional descriptive statistics of the raw and T-transformed scores for depression severity. Many participants attended a majority of group sessions (mean attendance percentage= 78.07, SD=26.42), were highly motivated to attend sessions (mean=4.18 out of 5, SD=1.14), and practiced skills at home (94.7%). As noted above, this variable was removed from further analyses. See Table 4 for additional descriptive statistics of outcome variables. See Table 5 for key variable breakdowns by therapy group number. See Table 6 for key variables breakdowns by ethnicity. Further analyses are interpreted relative to these breakdowns, as these divisions revealed that data were highly skewed by therapy group number and ethnic background. These additional tables are present to aid in understanding the sample breakdown; however, the sample size was too small to examine nested analyses (e.g. attendance rates within a specific group or with at specific sites).

All CDI-2 scales were strongly correlated with one another except for negative mood/physical symptoms with negative self-esteem (r=.23, p=.15) and negative self-esteem with ineffectiveness (r=.27, p=.08). Additional notable correlations were negative self-esteem with Hispanic/Latinx background (r=.38, p<.05), age with sessions attended (r=-.32, p<.05), and

Hispanic/Latinx background with sessions attended (r=.35, p<.05). The two dependent variables (sessions attended and self-reported motivation) were not significantly related to each other. See Table 7 for full correlation matrix between predictor and outcome variables.

3.3 Aim 1: Depression Severity, Age, and Hispanic/Latinx Background Main Effects

The first aim of this study was to understand whether depression severity, age, and Hispanic/Latinx background independently predicted subsequent engagement with the MBSG intervention (attendance rates and motivation levels). To examine these independent contributions, step 1 of the main hierarchical regression models included only these terms. As shown in Table 8, there was a trend for overall prediction of attendance rates, F(3, 38)=2.734, p = .057, with Hispanic/Latinx background trending as an individual predictor of increased attendance, B=15.9, p=.072. However, prediction of motivation levels was not significant (See Table 9).

3.4 Aim 2: Hispanic/Latinx Background Moderation

The second aim of the study was to determine whether Hispanic/Latinx background moderated relationships between depression severity and engagement metrics and age and engagement metrics. To examine possible moderation effects, step 2 of both hierarchical regression models introduced calculated interactions terms between depression severity and Hispanic/Latinx background and age and Hispanic/Latinx background. As shown in Tables 8-9, Hispanic/Latinx background did not significantly moderate these relationships. For prediction of attendance, although the overall model was significant, F(5, 36) = 2.619, p < .05, no individual or interaction terms reached significance.

3.5 Aim 3: Depression Subscale Exploratory Analyses

The third aim of the study was to explore whether specific aspects of adolescent depression, as measured by subscales of the CDI-2, functioned as predictors of engagement. To explore these relationships, each depression subscale was individually entered into multiple regression models (including age, Hispanic/Latinx background, and their interactions) predicting the two outcome engagement variables. There were 6 subscales utilized in this study, making for

a total of 12 regression analyses. Omnibus effects of all 12 models were examined to determine if any of these models were significant. Following Benjamini-Hochberg corrections for familywise error, set at an FDR of .10, one model remained significant: the analysis in which interpersonal problems predicted attendance percentage met criteria for significance, F(5,36)=4.53, p=.003, *B-H critical value*=.005. See Table 10 for outcomes for all exploratory analyses.

Given low reliability for many of the CDI-2 subscales, we explored whether reliability could be improved by refining the subscales. We discovered 3 problematic items that yielded negative or near 0 item-to-total correlations for their respective subscales (Items 5, 18, and 23). Item 5 dealt with closeness to family (interpersonal problems subscale, item-to-total r=.008), item 18 dealt with physical complaints of aches and pains (negative mood/physical symptoms subscale, item-to-total r=.03), and item 23 dealt with making comparisons to other individuals (ineffectiveness subscale, item-to-total r=.09). Removal of these items from these subscales improved internal consistency but did not alter results of prediction (See Table 12). Following Benjamini-Hochberg corrections for family-wise error, interpersonal problems predicting attendance was still the only analysis that met criteria for significance, F(5,36)=4.39, p=.003, B-H critical value=.008. See Appendix A for full details of these exploratory analyses including Item-Total Correlations and Changed Cronbach's Alphas for Problematic Scales (Table 11), Changes to Cronbach's Alpha with Problematic Items Removed (Table 13), and Results of Aim 3 with Problematic Items Removed (Table 14).

CHAPTER 4. DISCUSSION

This study was conducted to more fully understand factors related to adolescent engagement with psychotherapy for depression, with a focus on Hispanic/Latinx groups, a topic that is not well researched. Using data from a study that examined the feasibility and acceptability of a mind-body intervention for adolescents with depression (Aalsma et al., 2020), we focused on depressive severity, age, and Hispanic/Latinx background as predictors of engagement, examining both direct and interactive associations. While both age and Hispanic/Latinx background were related to one form of engagement (attendance), depression severity was not. However, their independent contributions are less clear. Moreover, contrary to hypotheses, Hispanic/Latinx background did not interact with other variables to predict engagement.

4.1 Engagement Findings

Prior to discussing predictors, one should note that engagement in the current sample was high, with mean attendance at near 80% of all sessions and many adolescents endorsing high motivation and high levels of practice rates of skills at home at post-intervention. Indeed, the high levels of at-home practice had little variability (all but 2 participants reported home practice); these ceiling effects prevented us from examining this variable as an outcome. Additionally, the motivation level of this sample was relatively high, averaging a value of 4 on a 5-point Likert scale. The high engagement levels reported by this sample are unusual for adolescents undergoing therapeutic intervention; data from the adolescent engagement literature show that adolescents typically "no-show" sessions and have high levels of dropout rates and premature termination (De Haan, Boon, de Jong, Hoeve, & Vermeiren, 2013; Gopalan et al., 2010), report less intrinsic motivation than adults to engage with therapy (Breda & Heflinger, 2007), and typically do not complete therapy "homework" assignments (Hudson & Kendall, 2002; Jungbluth & Shirk, 2013). The sample's lack of alignment with these consistently found trends in the literature suggests several possibilities: 1) the current sample may have higher baseline levels of engagement compared to the larger population, 2) the current intervention may have particularly engaged the current sample, 3) parent involvement may have been high in the

current sample, or 4) the data in this study were highly susceptible to effects of respondent bias due to the reliance of self-report and interviewing measures for data collection.

The first explanation of higher baseline levels of engagement is supported by the sample makeup: most of our participants were female and younger, both factors associated with higher engagement (DiCroce et al., 2016; Rice, Purcell, & McGorry, 2018). This is especially relevant to consider relative to the way recruitment was conducted – via referral from behavioral health clinicians' caseloads. This type of convenience sampling may itself reflect that referrals were biased towards participants who already had established working relationships with clinicians and high engagement in care, typically younger females (DiCroce et al., 2016; Rice et al., 2018). Because our sample was skewed towards this group, future studies may want to investigate alternative methods of recruitment such as random sampling and oversampling for male participants.

In addition to the sample make-up, another possible factor for high engagement rates may have been that the intervention itself was particularly engaging to individuals from various ages or ethnic groups. According to results from the parent study and a related qualitative study, the MBSGs were well received and accepted by the current population, which suggests that the adolescents likely enjoyed engaging in this intervention and had motivation to continue engaging with it over time (Aalsma et al., 2020; Jones et al., submitted for review). This high acceptability was expected, given that the literature suggests that MBM modalities may be particularly appealing to adolescents due to their employment of group formats (Dunning et al., 2019; Klingbeil et al., 2017), personalization of content (Church, 1994; Gordon & Kimmel, 2006), and facilitation of social support from other group members (Gariépy et al., 2016; Nardi et al., 2017). Many of these elements highlight the importance of personal choice and autonomy, values which are critical for adolescents to explore for positive mental health development (Church, 1994). As a whole, these findings suggest that this intervention may be particularly engaging for adolescent populations.

As an alternative consideration, though engagement might have been high for this intervention, this may not have fully occurred as a direct result of adolescent autonomy, but rather, as a possible result of high parent involvement. Within this sample, only a minority of participants had the means and were of age to transport themselves to sessions, which meant parental involvement was likely high. Others have noted the importance of parental involvement

for engaging adolescents (Bolton Oetzel & Scherer, 2003).If parental involvement were high, it may be that parental involvement buffered against low engagement for this sample of adolescents; some have suggested that this may occur by way of parents encouraging their children to attend therapy or taking a more active role in ensuring they attended therapy (Karver et al., 2006). If this were the case, rather than high adolescent motivation, it may be that parental motivation was particularly high in this sample, which was not measured; regardless, this characteristic would still raise adolescent attendance rates. Though the collected data suggest that MBSGs were able to engage adolescents and their parents, there is more work needed to understand whether this type of engagement is actually helpful for improving adolescent outcomes for depression treatment or undermines adolescent autonomy (Church, 1994; Zuroff et al., 2007) – future studies may want to more explicitly investigate these constructs.

Finally, there may be methodological factors that may introduce error or bias into our measures of engagement, particularly for the self-report measures of motivation and homework completion. Some of these biases could be tied to recency effects, especially when one considers that data collection for motivation and at-home practice occurred at post-intervention. Adolescents may have been reporting their current levels of motivation or at-home practice after completing a full course of intervention, which may have drastically differed from their motivation throughout the intervention. As an additional consideration, studies show that participants tend to overemphasize positive experiences and view negative experiences better over time (Ottenstein & Lischetzke, 2020; Raghubir & Latimer, 2013) – for the current study, such effects would bias responses in a way that artificially elevate motivation levels or at-home practice, especially since participants may have intuited these as "desired" outcomes of the study.

4.2 Depression Findings

Based on previous literature, we hypothesized that depression may decrease engagement with therapy by way of decreasing motivation levels (Kwan et al., 2010; Wilansky-Traynor et al., 2010). However, despite high levels of self-reported depression (with mean scores in the very elevated range on all subscales but one), engagement rates were high, and we found no significant main effects for baseline severity of depression symptoms or related interaction effects within this study. This suggests that either this mechanistic theory of depression and

engagement may not apply to this sample or depression may not have been the driving factor for engagement with this intervention. As an additional consideration for interpretation, this outcome is likely not due to restricted range/reduced variability in the predictor variable because raw scores were used in analyses rather than transformed scores, which are more susceptible to ceiling/floor effects in the CDI-2 (Kovacs & MHS Staff, 2011).

As discussed earlier, a possible explanation for these seemingly contradictory findings is that adolescents were highly engaged due to intervention-specific factors beyond depression severity. Briefly, these factors related mostly to increased levels of social support and autonomy that are commonly facilitated by mind-body focused interventions (Gariépy et al., 2016; Klingbeil et al., 2017; Nardi et al., 2017). It may be that these elements may be highly appealing to adolescents as a whole rather than adolescents with depression alone – in fact, this specific MBSGs intervention has already been shown to engage adolescents in other contexts. An RCT conducted in Kosovo using the same intervention format found that all participants (n=77) in their study completed the intervention, and a pre-post comparison study in Gaza found that more than half of participants completed follow-up visits (Gordon et al., 2008; Staples et al., 2011). As such, a possible explanation for this finding is that depression severity alone may not be sufficient to discourage adolescents from engaging with therapy – there may be other factors that can both encourage and discourage adolescents from engaging with therapy.

While overall depression severity was unrelated to engagement, one aspect of depression appeared to have some predictive value. Exploratory analyses showed that interpersonal problems predicted greater attendance; however, this finding must be interpreted relative to low reliability within the data. Because, the interpersonal problems subscale of the CDI-2 reflects difficulties the adolescent may have interacting with peers or family (Kovacs & MHS Staff, 2011), it seems paradoxical that this subscale showed a positive relationship to attendance, especially as the baseline mean interpersonal problems score for this sample fell into the highly elevated range. A possible explanation is that the group therapy aspect of the MBSGs was appealing. Perhaps for these adolescents, the groups presented a safe way to make friends and interact with peers, which may have motivated them to continue attending and facilitating these bonds. This finding may suggest that interventions with a group element may be more appealing to adolescents, particularly those who have high levels of interpersonal difficulties and related depression symptoms; in fact, recent meta-analytical work has shown that adolescents with high

anxiety and social anxiety may prefer group-based interventions over individual interventions (Keles & Idsoe, 2018; Yang et al., 2019; Zhou et al., 2019). Research suggests that increased exposure to social stimuli and interactions via group therapy may be a means for adolescents to more safely and effectively combat socially-based fears (Zhou et al., 2019). Given that interpersonal interactions are inherently social, it may be possible that these preferences can also extend to the current sample of depressed adolescents with high interpersonal difficulties.

4.3 Age Findings

As hypothesized, older adolescents were less likely to attend sessions, but, when examined in combination with other predictors, age did not maintain an independent predictive relationship. This finding is likely due to the study being underpowered, given that, in combination with other predictors, the p-values for age were still below a value of .10. Because we were sampling from individuals between the ages of 13-17, a higher sample size may be necessary to capture variance associated with age. In adolescence, a factor of a few years can constitute disproportionate life differences – older adolescents may feel more comfortable using public transportation or have their own means to get to sessions while younger adolescents may be entirely reliant on their parents for engaging with therapy. Importantly, our sample was at an average age of 15, which is below the legal age that one may acquire a driver's license in the state of Indiana. Indeed, the literature shows that transportation or related economic difficulties are frequent barriers to adolescent attendance to therapy (Bolton Oetzel & Scherer, 2003; Caplan & Whittemore, 2013; Constantino et al., 2010; Wilson & Deane, 2001).

Age, however, was not related to self-reported motivation in the current sample. As previously discussed, it is possible that this finding is due to the measurement difficulties with the motivation metric such as response bias or ceiling effects. An alternative explanation is that age may matter less in group interventions where adolescent participants may vary in age but have similar presenting concerns. In the literature, there is high variability in what age ranges constitute "adolescence" with some dividing groups into older/younger categories, some setting cutoffs at age 12 for younger and 16 for older adolescents, and some electing to only have groups of more homogenously aged participants (Curry, 2014; Ilardi & Kaslow, 2009; Keles & Idsoe, 2018; Nardi et al., 2017; Wierzbicki & Bartlett, 1987). In the current study, participants were recruited from age 13-17 and groups were heterogenous with regard to age. Because social

support has been identified as a key element of adolescent group therapy (Gariépy et al., 2016; Shirk & Karver, 2003), it may be that adolescents viewed group therapy as inherently useful or rewarding regardless of the ages of other participants. This would have been particularly important for older adolescents undergoing this intervention, as the literature suggest they should have had lesser motivation to engage with the intervention (Piacentini et al., 1995; Wilansky-Traynor et al., 2010). The lack of any found age-related effects may suggest that, for these adolescents, the appeal of group interventions may have outweighed initial lower motivation levels.

4.4 Latinx/Hispanic Background Findings

Our sample consisted of primarily Hispanic/Latinx adolescents – these adolescents were more likely to attend sessions, but, in combination with other variables, this factor did not meet traditional significance levels. The positive correlation between being Hispanic/Latinx and attending sessions is surprising considering that literature in this domain previously suggested that ethnic/racial minorities (Miranda et al., 1996; Thompson et al., 2004), especially Hispanic/Latinx adolescents (Miller et al., 2008), underutilize healthcare services. One explanation for this finding may be that, given the small sample of participants, this sample of Hispanic/Latinx individuals may constitute outliers. As noted above, recruitment was based on clinician referral, and so these participants may have already been highly engaged with treatment. An additional explanation for this finding, rooted in literature on parenting styles by culture, may be that that many of the Hispanic/Latinx parents of participants in this sample aligned with authoritarian parenting styles, as the literature suggested is typical (Driscoll et al., 2008). In combination with the younger age of our sample, it may be that parents did have a greater role in the healthcare decisions for these participants such that they strongly encouraged their children to more frequently attend groups. Another cultural explanation may be that, as a majority of the sample was Hispanic/Latinx, participants may have been more easily able to relate to their cultural peers – a form of *familismo* (Jeannette Rosselló et al., 2008). This may be particularly relevant in the current sample, in which certain therapy groups demographics were individually skewed toward Hispanic/Latinx demographics. This may have also served to reduce mental health stigma that is inherent to Hispanic/Latinx cultures. That is, participants and families were seeing individuals from similar backgrounds, and this may have normalized

engaging in mental health care. Indeed, the literature has demonstrated that culturally-tailored interventions for specifically Hispanic/Latinx participants typically show high engagement levels, especially when they are the majority of the demographic makeup of groups (Hoskins, Duncan, Moskowitz, & Ordonez, 2018; Jeannette Rosselló et al., 2008; Sanchez et al., 2019; Smokowski, Rose, & Bacallao, 2008). These explanations must be considered relative to the limitations of the current study, however, in which the comparison group to Hispanic/Latinx participants included members from other ethnic/racial minority groups, such as Black participants. Much like for Hispanic/Latinx cohorts, there is a need for more research on engagement trends for this population of Black adolescents, but initial studies show that this group may show even further decreased rates of engagement with health systems due to factors such as cultural mistrust of health services (Whaley, 2016). In particular, more work is needed on engaging adolescent, Black males, who have historically been a difficult group the engage with mental health services (Whaley, 2016; Wilson & Cottone, 2013). Though there were few Black participants in the current study, it will be important in future work to consider the interactions that multiple ethnic identities can have on engagement profiles.

We used self-reported ethnicity to attempt to capture larger cultural constructs; however, there are variations in how much this label applies to specific individuals, and we were not able to capture cultural identity in more nuanced ways. For example, though we were not able to measure acculturation directly in the current study, anecdotal evidence (such as the fact that some families required the use of translation services during the consent/assent process) suggests that Hispanic/Latinx families who participated in the current study varied in their level of acculturation. Studies show that more highly acculturated Hispanic/Latinx families are more likely to disengage with therapy while less acculturated Hispanic/Latinx families are more likely to continually engage (Kim, Lau, & Chorpita, 2016). This may align with a deeply held value of Hispanic/Latinx culture - respeto - which constitutes providing respect and deference towards individuals of authority (Jeannette Rosselló et al., 2008). Studies show that Hispanic/Latinx individuals particularly show reverence and respect towards medical professionals-they are also more likely than Caucasian individuals to use provided health information when they do seek it out (Lopez & Carrillo, 2008; Rooks, Wiltshire, Elder, BeLue, & Gary, 2012). As a final consideration on this topic, higher levels of acculturation are associated with greater levels of parent-child conflict (Smokowski et al., 2008); if this sample showed lower levels of
acculturation, perhaps increased synergy between parents and their children facilitate increased engagement for this intervention. Further study on this topic may be necessary to assess how parent-child interactions impact willingness to participate in therapy.

4.5 Measurement of Engagement

Based on the reviewed literature, we selected three different ways to measure engagement that were available in the current study: session attendance, self-reported motivation, and homework completion. As discussed above, our primary indicator of engagement, attendance, was related to some predictors, but the other two indices were more problematic. First, we could not use the homework completion as measured in this study due to a lack of variability. Second, we did not find convergence between the two other engagement measures utilized in the current study: attendance rates and self-reported motivation.

A possible reason for these differences may come from ceiling effects and related measurement difficulties – we found that most participants reported high levels of motivation and at-home practice. It is clear that we needed more nuanced ways to measure both of these constructs. Indeed, most studies that investigate motivation levels or homework completion rates of adolescents tend to track these metrics over time, concurrent with active intervention. Studies that tracked weekly engagement via metrics such as audiotape recording of sessions (Jungbluth & Shirk, 2013), clinician rating (Frei & Peters, 2012), completion rates (LeBeau et al., 2013; Simons et al., 2012), and self-report measures (Hudson & Kendall, 2002; LeBeau et al., 2013) have found differential effects between individuals with varied levels of motivation and homework completion rates. Studies utilizing these methodologies have been able to consistently show that lower levels of motivation and homework completion were associated with poorer outcomes (Holdsworth et al., 2014; Jungbluth & Shirk, 2013; Kazantzis et al., 2018).

An additional measurement consideration is the timing in which data were collected – attendance data was collected throughout the intervention while self-reported motivation and athome practice were collected once at post-intervention. Having no baseline to compare these metrics with is problematic in that it invites recall bias or errors associated with retroactive recall. For example, as noted above, many studies have shown that retroactive ratings of past events are typically biased such that negative events are viewed more favorably over time, and this is especially true for events with emotional content (Ottenstein & Lischetzke, 2020;

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Raghubir & Latimer, 2013). Even further, positive emotions tend to be overestimated and selectively highlighted during recall, especially when there are social motives for the recall i.e. seeing things through "rose-colored lens." When one considers the manner in which follow-up interviews were conducted with adolescents -- participants were asked questions directly by research staff they had engaged with throughout the 10 week intervention, it is likely that many of these elements were at play. It may be that any motivation difficulties or concerns that the adolescents had throughout the intervention were overshadowed by positive experiences they had with the intervention, which is a strong possibility, as adolescents overwhelmingly deemed the intervention to be favorable and acceptable (Aalsma et al., 2020). Even further, self-reported motivation and at-home practice information were collected via an acceptability questionnaire and semi-structured interview post-intervention – desirability effects may have been in play and artificially elevated participants' scores. Future studies may consider collecting these types of information over time and through various means rather than self-report or interviews.

4.6 Limitations

We are not able to make causal claims due to the inherent inability to randomize variables such as depression scores or engagement levels – and, as this study was part of a feasibility pilot study, we were also limited by the specific population from which we sampled. Although we were sufficiently powered to test Aim 1, we were limited in testing interactions (Aim 2) and the exploratory analyses of subscales (Aim 3). That is, we were not powered to detect small effects – larger studies will be needed to examine these effects more fully.

We were also limited in the operationalization of constructs assessed via measures in this study such as depression severity and Hispanic/Latinx background. For example, the correlations within subscales of the CDI-2 were weak and this measure showed few correlations with engagement metrics. Moreover, some of the subscales had low internal consistency. We discovered 3 problematic items that yielded negative or near 0 item-to-total correlations for their respective subscales. Although exploratory analyses removing these problematic items found no significant changes to the results, other data indicate that this scale may be problematic. Original data from the standardization sample of 1100 youth for the CDI-2 show that somewhat low reliability, with Cronbach's α going as low as .67 for certain subscales – the interpersonal problems has historically shown the lowest reliability (Bae, 2012; Cumba-Avilés, 2020; Kovacs

& MHS Staff, 2011). Moreover, the use of this measure in diverse populations has been cautioned against, as norming data came from participants in the United States, and this measure has not been validated for use in individuals who come from countries with different social and cultural backgrounds (Bae, 2012). In fact, there are only 4 studies reporting psychometric data for Hispanic/Latinx adolescents with this measure, and none of these studies established convergence with other validated measures of depression (Cumba-Avilés, 2020). More work may be needed to determine if this measure should be used for this specific population.

As discussed above, using a categorical, dichotomous moderator, Hispanic/Latinx background, leaves little room for variability for an identity that encompasses a large amount of different cultures and backgrounds. This type of labeling invites the assumption of homogeneity of group characteristics, which can confound the interpretation of results. For example, within this moderator, there are various aspects of culture that can be driving any of the observed relationships such as stigma and acculturation, which brings up a number of third variable problems.

These limitations are contextualized by the overarching goals of the parent study, which were mostly focused on implementation and feasibility of the integration of MBSGs into a primary care setting. The parent study was completed as a pilot study with the hopes of providing support for future studies. As a result, this archival study was similarly limited by inherent difficulties associated with pilot data testing.

4.7 Future Directions and Conclusions

In the future, we hope to further investigate the effectiveness of MBSGs for adolescents with depression. If adolescents do not engage in psychotherapeutic treatment, effectiveness will be limited, making engagement a key factor in studying the utility of a novel intervention. Future studies will seek to directly overcome current limitations: research will begin moving into the randomized control trial phase where participants are randomly assigned to an intervention or control group and investigating means to better operationalize racial/ethnic minority cultural factors (e.g., assessing collective self-esteem, subjective senses of identity, familial ethnic socialization, and/or acculturation). Indeed, the extent to which an individual identifies as Hispanic/Latinx can differentially drive these trends in a way that was not measured adequately in the current study. Identified measures that may help assess the mentioned constructs and may

be helpful in future research projects are the Collective Self-Esteem Scale (CES; Crocker, Luhtanen, Blaine, & Broadnax, 1994), Multigroup Ethnic Identity Measure (MEIM; Avery, Tonidandel, Thomas, Johnson, & Mack, 2007), Familial Ethnic Socialization Measure (FESM; Umana-Taylor, 2002), and Acculturation, Habits, and Interests Multicultural Scale for Adolescents (AHIMSA; Unger et al., 2002). Another avenue of possible research is to more fully assess and contextualize relationships between engagement and therapeutic outcomes; this line of research will directly inform dose-effect relationships for this intervention. The intent of future studies is to be able to identify and elucidate what aspects of different interventions are particularly helpful for specific populations, with the ultimate goal of determining how to best serve clients from a variety of different backgrounds.

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APPENDIX A: TABLES

Table 1

Specific aims and related hypotheses

<u>Aim 1</u>: Examine the independent contributions of depression severity, age, and Hispanic/Latinx background as predictors of engagement

la. Depression severity at baseline will be negatively associated with attendance to the MBSGs.

lb. Depression severity at baseline will be negatively associated with motivation to attend the MBSGs.

lc. Depression severity at baseline will be negatively associated with skill practice at home for the MBSGS.

1d. Age at baseline will be negatively associated with attendance to the MBSGs.

le. Age at baseline will be negatively associated with motivation to attend the MBSGs. *lf*. Age at baseline will be negatively associated with skill practice at home for the MBSGS.

Ig. Being Hispanic/Latinx will be negatively associated with attendance to the MBSGs. *Ih.* Being Hispanic/Latinx will be negatively associated with motivation to attend the MBSGs.

li. Being Hispanic/Latinx will be negatively associated with skill practice at home for the MBSGS.

<u>Aim 2</u>: *Examine the role of Hispanic/Latinx background as a moderator between age, depression severity, and engagement*

2a. Depression severity at baseline will be negatively associated with attendance to the MBSGs, and this will be especially true for Hispanic/Latinx individuals.

2b. Depression severity at baseline will be negatively associated with motivation to attend the MBSGs, and this will be especially true for Hispanic/Latinx individuals. 2c. Depression severity at baseline will be negatively associated with skill practice at home for the MBSGS, and this will be especially true for Hispanic/Latinx individuals. 2d. Age at baseline will be negatively associated with attendance to the MBSGs, but this

will be less true for Hispanic/Latinx participants

2e. Age at baseline will be negatively associated with motivation to attend the MBSGs, but this will be less true for Hispanic/Latinx participants

2f. Age at baseline will be egatively associated with skill practice at home for the MBSGS, but this will be less true for Hispanic/Latinx participants

<u>Aim 3</u>: Explore subscales of adolescent depression as predictors of engagement

Participant Characteristics (N=42)

Characteristic	Frequency	Percent
Gender		
Male	9	21.4%
Female	33	78.6%
Race		
Black or African American	8	19.0%
White or Caucasian	15	35.7%
Multiracial	15	4.8%
Refused	17	40.5%
Ethnicity		
Not Hispanic or Latino	13	31.0%
Hispanic or Latino	29	69.0%
Education Level		
$7^{\text{th}} - 9^{\text{th}}$ grade	24	57.1%
$10^{\text{th}} - 12^{\text{th}}$ grade	18	42.9%
Age (M=15.3, SD=1.3)		

Descriptive Statistics of CDI-2 Scales at Baseline

Predictor	Cronbach's Alpha	Mean (Raw)	SD (Raw)	Possible Range (Raw)	Mean (T-Score)	SD (T-Score)	Clinical Interpretation
Total CDI-2 Score	.81	26.62	7.39	(0-56)	75.19	9.69	Very Elevated
Negative Mood/Phys. S.	.57	8.82	3.18	(0-18)	73.38	10.88	Very Elevated
Negative Self-Esteem	.83	5.38	2.71	(0-12)	71.26	11.37	Very Elevated
Ineffectiveness	.55	8.71	2.49	(0-16)	70.62	12.89	Very Elevated
Interpersonal Problems	.39	3.73	1.72	(0-10)	72.95	9.76	Very Elevated
Emotional Problems	.72	14.18	4.63	(0-30)	69.76	9.26	Elevated
Functional Problems	.68	12.45	3.74	(0-26)	71.43	13.10	Very Elevated

Higher scores indicated higher depression severity.

Depression classification categories are as follows: Very Elevated (\geq 70), Elevated (65-69), High Average (60-64), Average or Lower (\leq 59).

Descriptive Statistics of Outcome Variables (N=42 for Total Attendance, N=38 for Self-Reported Motivation and At-Home Practice)

Predictor	Mean	SD
Total Attendance (%)	78.07%	26.42%
Self-Reported Motivation	4.18	1.14
At-Home Practice (%)	94.7%	22.6%
(Did not practice = 2 (5.3%), Pro	acticed =36 (94.7%))	

Self-Reported Motivation was rated on a 5-point Likert scale (1 = do not agree; 5 = completely agree)

Participant Key Variables by Group Number

Variable	Group 1	(n=10)	Group 2	(n=8)	Group 3	(n=7)	Group 4	(n=8)	Group 5	(n=9)
variable	Frequency	Percent								
Gender										
Male	1	10%	1	12.5%	1	16.7%	3	37.5%	3	33.3%
Female	9	90%	7	87.5%	6	83.3%	5	62.5%	6	66.7%
Race										
Black or African	2	200/	2	27 50/	0	00/	1	12 50/	1	11 10/
American	3	30%	3	57.5%	0	0%	1	12.3%	1	11.170
White or	2	200/	2	27 50/	Λ	57 10/	Λ	500/	2	22.20/
Caucasian	Ζ.	20%	3	57.5%	4	37.170	4	30%	Z	22.270
Multiracial	1	10%	0		0	0%	0		1	11.1%
Refused	4	40%	2	25%	3	42.9%	3	37.5%	5	55.6%
Ethnicity										
Not Hispanic or	5	500/	4	500/	0	00/	2	27 50/	1	11 10/
Latino	5	3070	4	3070	0	070	5	57.570	1	11.170
Hispanic or	5	500/	4	500/	7	1000/	5	62 50/	o	00 00/
Latino	5	3070	4	3070	/	100%	5	02.370	0	00.970
Education Level										
$7^{\text{th}} - 9^{\text{th}}$ grade	8	80%	4	50%	3	42.9%	3	37.5%	6	66.7%
$10^{\text{th}} - 12^{\text{th}}$ grade	2	20%	4	50%	4	57.1%	5	62.5%	3	33.3%
	Mean	SD								
Depression	26.5	96	25	96	24.1	4.2	26	05	20.9	5 2
Severity	20.3	0.0	23	0.0	24.1	4.2	20	0.3	50.8	5.5
Age	14.9	1.3	15.4	1.7	15.4	1.5	15.6	1.2	15.1	0.9
Total	920/	22 60/	750/	25 60/	0.00%	100/	68 60/	220/	71 10/	22 60/
Attendance (%)	0370	22.070	1370	23.070	9070	1070	00.070	3370	/4.470	33.070
Self-Reported	4.0	0.2	4.4	1.5	2.2	1.2	3.6	1 2	1 1	0.7
Motivation	4.7	0.5	4.4	1.3	3.3	1.2	5.0	1.2	4.4	0.7
At-Home	100%	0%	100%	0%	80%	40%	90%	40%	100%	0%
Practice (%)										

Participant Key Variables by Ethnicity

Variable ender [ale [ale emale ace lack or African American /hite or Caucasian [ultiracial] efused ducation Level h - 9 th grade 0 th - 12 th grade epression Severity ge otal Attendance (%) elf-Reported Motivation	Not Hispanic or l	Latino (n=13)	Hispanic or Latino (n=29)		
variable	Frequency	Percent	Frequency	Percent	
Gender					
Male	2	15.4%	7	24.1%	
Female	11	84.6%	22	75.9%	
Race					
Black or African American	8	61.5%	0	0%	
White or Caucasian	4	30.7%	11	38%	
Multiracial	1	7.8%	1	3.3%	
Refused	0	0%	17	58.7%	
Education Level					
$7^{\text{th}} - 9^{\text{th}}$ grade	6	46.2%	18	62%	
$10^{\text{th}} - 12^{\text{th}}$ grade	7	53.8%	11	38%	
	Mean	SD	Mean	SD	
Depression Severity	26.2	6.0	26.8	8.0	
Age	15.8	1.3	15.1	1.2	
Total Attendance (%)	64.6%	31.5%	84.1%	21.8%	
Self-Reported Motivation	4.4	0.9	4.1	1.2	
At-Home Practice (%)	90%	30%	100%	0%	

Correlations Between Predictors and Outcome Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Depression Total	-										
2. Negative Mood/Phys. S.	.76**	-									
3. Negative Self-Esteem	.66**	.23	-								
4. Ineffectiveness	.78**	.50**	.27	-							
5. Interpersonal Problems	.73**	.33*	.43*	.57**	-						
6. Emotional Problems	.91**	.82**	.75**	.50**	.48**	-					
7. Functional Problems	.85**	.48**	.38*	.93**	.84**	.55**	-				
8. Age	.06	.00	12	.30	.03	07	.21	-			
9. Hispanic/Latinx Background	.04	03	.38*	22	08	.21	18	25	-		
10. Sessions Attended	.00	03	.08	15	.17	.03	02	32*	.35*	-	
11. Motivation	15	19	13	04	01	21	04	.15	10	01	-

*p<.05, **p<.01

Regression of depression severity, age, and Hispanic/Latinx background to predict attendance percentage

	В	SE	t	р	F	р
Step 1						
Constant	67.081	7.069	9.490	.000	F(3,38)=2.734	.057
Depression Severity	.038	.528	.072	.943		
Hispanic/Latinx B.	15.914	8.595	1.852	.072		
Age	-5.134	3.126	-1.643	.109		
Step 2						
Constant	69.829	7.173	9.735	.000	F(5,36)=2.619	.040*
Depression Severity	1.413	1.213	1.164	.252		
Hispanic/Latinx B.	14.080	8.500	1.657	.106		
Age	-9.754	5.613	-1.738	.091		
H/L X Depression S.	-1.909	1.346	-1.419	.165		
H/L X Age	8.455	6.751	1.252	.218		

Regression of depression severity, age, and Hispanic/Latinx background to predict motivation

	В	SE	t	р	F	р
Step 1						
Constant	4.338	.349	12.418	.000	F(3,34)=.661	.582
Depression Severity	025	.025	975	.336		
Hispanic/Latinx B.	189	.420	450	.656		
Age	.148	.164	.901	.374		
Step 2						
Constant	4.333	.342	12.659	.000	F(5,32)=1.428	.241
Depression Severity	.078	.065	1.204	.238		
Hispanic/Latinx B.	139	.406	342	.734		
Age	.007	.292	.023	.982		
H/L X Depression S.	128	.070	-1.835	.076		
H/L X Age	.314	.351	.895	.378		

Exploratory Analysis Results

Primary Predictor	Outcome Variable	df	Test Statistic	р	Index	B-H Critical	Value
Interpersonal Problems	Attendance	(5,36)	F=4.53	.003	1	.008	*
Functional Problems	Attendance	(5,36)	F=3.10	.02	2	.017	ns
Negative Mood/Phys. S.	Attendance	(5,36)	F=2.48	.05	3	.025	ns
Ineffectiveness	Attendance	(5,36)	F=2.46	.051	4	.033	ns
Emotional Problems	Attendance	(5,36)	F=2.24	.072	5	.042	ns
Negative Self-Esteem	Attendance	(5,36)	F=2.15	.081	6	.05	ns
Negative Mood/Phys. S	Motivation	(5,32)	F=1.85	.131	7	.058	ns
Emotional Problems	Motivation	(5,32)	F=1.40	.252	8	.067	ns
Interpersonal Problems	Motivation	(5,32)	F=1.29	.292	9	.075	ns
Functional Problems	Motivation	(5,32)	F=1.10	.381	10	.083	ns
Ineffectiveness	Motivation	(5,32)	F=.81	.552	11	.092	ns
Negative Self-Esteem	Motivation	(5,32)	F=.45	.81	12	.01	ns
FDR=.1							

Item Number	Brief Description	Item-Total Correlation	Cronbach's Alpha if deleted
Negative Mood/Phys. S (α =.57)			
Item 1	Sadness	.49	.48
Item 9	Crying	.25	.55
Item 10	Cranky	.38	.51
Item 15	Sleep	.25	.55
Item 16	Tired	.43	.49
Item 17	Eating	.17	.57
Item 18	Aches/Pains	03	.61
Item 26	Napping	.23	.55
Item 27	Binging	.28	.54
<u>Ineffectiveness (α=.55)</u>			
Item 3	Success	.41	.47
Item 4	Fun	.28	.51
Item 12	Decisiveness	.19	.54
Item 14	School Motivation	.24	.52
Item 20	School Fun	.37	.47
Item 22	Academics	.50	.41
Item 23	Comparisons	09	.64
Item 28	Memory	.26	.51
<u>Interpersonal Problems (α=.39)</u>			
Item 5	Family	.008	.49
Item 11	Socializing	.14	.39
Item 19	Loneliness	.30	.27
Item 21	Friends	.27	.28
Item 25	Friend Interactions	.33	.24

Table 11

Item-Total Correlations and Changed Cronbach's Alphas for Problematic Scales

Table 12

Reliability Changes from Removal of Problematic Items (Cronbach's α)

Scale	Original	Changed
Total Depression	.81	.81
Negative Mood/Phys. S	.57	.62
Negative Self-Esteem	.83	.83
Ineffectiveness	.55	.64
Interpersonal Problems	.39	.49
Emotional Problems	.72	.74
Functional Problems	.68	.69

Correlations Between Predictors, Outcome Variables, and Problematic Items

	1	2	3	4	5	6	7	8
1. Item 5 (Family)	-							
2. Item 18 (Aches)	23	-						
3. Item 23 (Good enough comparison)	.19	06	-					
4. Depression Total	.30	15	.13	-				
5. Age	11	14	13	.06	-			
6. Hispanic/Latinx Background	.28	.09	.18	.04	25	-		
7. Sessions Attended	.14	.09	.08	.01	32*	.35*	-	
8. Motivation	03	17	09	15	.15	10	01	-

*p<.05, **p<.01

Note: Depression Total predictor does have the problematic items removed.

Exploratory Analyses Results without Problematic Items

Primary Predictor	Outcome Variable	df	Test Statistic	р	Index	B-H Critical	Value
Interpersonal Problems	Attendance	(5,36)	F=4.39	.003	1	.008	*
Functional Problems	Attendance	(5,36)	F=3.15	.018	2	.017	ns
Negative Mood/Phys. S.	Attendance	(5,36)	F=2.37	.059	3	.025	ns
Ineffectiveness	Attendance	(5,36)	F=2.33	.062	4	.033	ns
Emotional Problems	Attendance	(5,36)	F=2.21	.075	5	.042	ns
Negative Self-Esteem	Attendance	(5,36)	F=2.15	.081	6	.05	ns
Negative Mood/Phys. S	Motivation	(5,32)	F=1.48	.223	7	.058	ns
Emotional Problems	Motivation	(5,32)	F=1.31	.284	8	.067	ns
Interpersonal Problems	Motivation	(5,32)	F=1.26	.304	9	.075	ns
Functional Problems	Motivation	(5,32)	F=1.12	.372	10	.083	ns
Ineffectiveness	Motivation	(5,32)	F=0.76	.584	11	.092	ns
Negative Self-Esteem	Motivation	(5,32)	F=0.45	.81	12	.01	ns
FDR=.1							

APPENDIX B: FIGURES



Figure 1. Parent and current study overview



Figure 2. Hierarchical regression steps



Figure 3. Full hierarchical regression model

APPENDIX C: DEMOGRAPHICS QUESTIONNAIRE

IRB #1707293727

CMBM Study Demographic Information Form					
Subject ID:	Screen Visit Date:				
Research Staff Completing Form:					
Please ask the adolescent the following questions:					
1. What is your date of birth?					
2. What is your gender?					
□ Male □ Female					
3. What is your race? (Choose all that may apply)					
□ American Indian or Alaska Native					
🗆 Asian					
Black or African American					
□ Native Hawaiian or Pacific Islander					
☐ White or Caucasian					
4. What is your ethnicity?					
☐ Hispanic or Latino					
☐ Not Hispanic or Latino					
5. What grade are you in or what was the last grade you completed?					

6. What is the highest level of education your parent(s)/guardian(s) have completed? (Note:	: if
more than 2, list the 2 with the highest education.)	

a. Parent/Guardian 1: Relationship to adolescent

Less than high school degree/GED: highest grade attended if known

□ High School degree/GED

□ Some college coursework

V: 09/06/2017

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IRB #1707293727

CIVIDIVI Study Dellio	
Subject ID:	Screen Visit Date:
Research Staff Completing Form:	
□ Associates degree	
☐ Bachelors degree	
☐ Masters degree	
□ Doctorate degree	
□ Unknown	
h Devent/Ourselien 2: Deletienship to	adalaaaa ii
b. Parent/Guardian 2: Relationship to	
□ Less than high school degree/GED): highest grade attended if known
☐ High School degree/GED	
□ Some college coursework	
☐ Associates degree	
☐ Bachelors degree	
☐ Masters degree	
Doctorate degree	
Unknown	
. FASII (Coding in parentheses, not to be re	ad to adolescent):
a Does your family own a car, yan, or	r truck?
□ No (0) □ Yes, on	e <i>(1)</i> □ Yes, two or more <i>(2)</i>
b. Do you have your own bedroom for	r yourself?
□ No (0) □ Yes (1)	
c. During the past 12 months, how may your family?	any times did you travel away on vacation with
$\Box \text{ Not at all } (0) \qquad \Box \text{ Once } (1)$) \Box Twice (2) \Box More than twice (3)
d. How many computers does your fa	mily own?
□ None (0) □ One (1)	□ Two (2) □ More than two (3)
: 09/06/2017	Page 2 of 2

APPENDIX D: ACCEPTABILITY QUESTIONNAIRE

CMBM Study IRB #1707293727

1

Subject ID: _____ Date: _____ Completed by (initials):__

Acceptability Questionnaire

Post-intervention/Visit 2

□ 3-month follow-up/Visit 3

Please place a checkmark or an X in the appropriate box to mark your answer for each question.

	Do Not Agree (1)	Minimally Agree (2)	Moderately Agree (3)	Mostly Agree (4)	Completely Agree (5)
1. The Mind-Body Skills Groups were useful.					
2. I had to force myself to attend the Mind-Body Skills groups.					
3. I apply what I learned in my everyday life.					
4. The Mind-Body Skills groups were enjoyable.					
5. I would recommend the Mind-Body Skills groups to others.					
6. I am certain I will benefit from the skills I learned in the long run.					
7. My group facilitators were understanding.					

CMBM Study IRB #1707293727

Subject ID: _____

Date: _____

Completed by (initials):____

Acceptability Questionnaire

□ Post-intervention/Visit 2

□ 3-month follow-up/Visit 3

Please rate how helpful you found skills that were taught:

Note: If a skill was not taught in a group you attended, please mark: Not Applicable.

	Not Applicable	Not at all Heinful	Minimally Helpful	Moderately Helpful	Mostly Helpful	Extremely Helpful
	Applicable	(1)	(2)	(3)	(4)	(5)
Meditation (done before each group)		Nul 19				
Drawings (3 drawings done in Weeks 1 and 10)						
Autogenic Training and Biofeedback (Week 2)						
Shaking and dancing meditation (Week 3)						
Guided Imagery (Week 4)						
Dialogue with a Symptom (Week 5)						
Genograms (Week 6)						
Forgiveness Meditation (Week 7)						
Mindful Eating (Week 8)						
Loving Kindness meditation (Week 9)						
Closing Ritual (Week 10)						
CMBM Study IRB #1707293727

Subject ID: _____

Date:

Acceptability Questionnaire: Open-Ended Questions

Post-intervention/Visit 2

□ 3-month follow-up/Visit 3

1. Did the Mind-Body Skills Groups help you? If so, how?

- 2. Is there anything you didn't like about the Mind-Body Skills Groups? If so, please explain.
- 3. What was the most important and interesting part of the group? Why?
- 4. If you practiced these skills at home, which ones did you practice the most and what did you like about them?
- 5. Has your life or your outlook on the world changed because of the group? If so, how?

Interviewer Signature: _____