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Cognitive Behavioral Therapy for Depressed Adults with Mild Intellectual Disability: A Pilot Study

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Abstract

Background—There is a paucity of research on psychosocial treatments for depression in adults with intellectual disability (ID). In this pilot study, we explored the efficacy of a group CBT treatment that involved a caregiver component in adults with mild ID with a depressive disorder.

Method—Sixteen adults with mild ID and a depressive disorder participated in a 10-week group CBT treatment and 8 adults with mild ID with a depressive disorder served as a treatment as usual (TAU) control group. Adults with mild ID and caregivers completed measures of depressive symptoms, behavior problems, and social skills at pre-treatment, post-treatment, and a 3-month follow-up. Adults with mild ID also completed a series of tasks to measure their understanding of the principles of cognitive therapy pre- and post-treatment.

Results—The CBT group demonstrated significant decreases in depressive symptoms and behavior problems from pre-treatment to post-treatment and these effects were maintained at a 3-month follow-up. The CBT group demonstrated significant improvements in their ability to infer

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emotions and thoughts based on various situation-thought-emotion pairings from pre-treatment to post-treatment.

Conclusions—Findings indicate that adults with mild ID with a depressive disorder benefitted from a group CBT treatment with a caregiver component. Moreover, adults with mild ID appeared to benefit, at least in part, from the cognitive therapy components of the treatment, in addition to the behavior therapy components.

Keywords

CBT; depression; intellectual disability; developmental disability; mental health; psychosocial treatment

Recent estimates indicate that 30% to 50% of individuals with intellectual disability (ID) have at least one mental health condition (Cooper, Smiley, Morrison, Williamson, & Allan, 2007a; Einfeld, Ellis, & Emerson, 2011). Depressive disorders are among the more common mental health conditions; population-based studies suggest that there is a half- to four-fold increase in the prevalence of depressive disorders in adults with ID as compared to adults without ID (Cooper, Smiley, Jillian, Williamson, & Allan, 2007b; Maughan, Collshaw, & Pickles, 1999; Richards et al., 2001). Unfortunately, there is a paucity of research on psychosocial treatments for depression in adults with ID and subsequently medications are often the only available evidence-based treatment option (Hollon, Thase, & Markowitz, 2002; Prout & Browning, 2011). There is a critical need to identify effective psychosocial treatments for adults with mild ID as not all adults with ID experience full reduction in depressive symptoms with medication (Ria & Kerr, 2010). Psychosocial treatments also teach skills for altering factors related to depression (e.g., negative thoughts/behaviors), and thus have longer-term effects than medication alone in the general population (Dobson et al., 2008). Moreover, psychosocial treatments may often be preferred given the potential for medications to have side effects, as well as the potential for drug interaction effects due to the lengthy list of medications taken by many adults with ID (Krahn, Hammond, & Turner, 2006). Indeed, adults with ID and their caregivers have voiced a need for psychosocial treatment options (McGillivray & McCabe, 2012; Weiss et al., 2009).

There is growing evidence that psychosocial therapies are feasible and often effective in adults with ID (Prout & Browning, 2011). Preliminary evidence suggests that cognitive behavioral therapy (CBT) can significantly reduce anger (see Vereenoooghe et al., 2013 for review) and may also reduce depressive symptoms in adults with ID (e.g., Dagnan & Chadwick, 1997; Hassiotis et al., 2013; McCabe, McGillivray, and Newton, 2006). CBT is a goal-oriented, short-term, therapy that combines behavior therapy, which is focused on learned behaviors and how the environment impacts these behaviors (O'Leary, Daniel, & Wilson, 1975), and cognitive therapy, which is focused on problematic beliefs, which are posited to mediate emotional and behavioral reactions (Beck, 1995; Ellis, 1977). CBT has been shown to be just as effective in treating depression as medication in the short-term, and has the added benefit of reducing the risk of relapse in the long-term in typically developing adults (e.g., Dobson et al., 2008; Hollon et al., 2006) and in children (Compton et al., 2004; Sukhodolsky, Kassinove, & Gorman, 2004). Support for the effectiveness of CBT in

typically developing children is especially relevant for the current study as children may be similar in developmental level as adults with mild ID.

Whether adults with mild ID can engage in and benefit from CBT, and particularly the cognitive therapy components, has been ardently debated (Esbensen & Hartley, 2012; Sturmey, 2004; Taylor, Lindsay, & Willner, 2010). Adults with mild ID and a depressive disorder endorse dysfunctional cognitive thought patterns (Esbensen & Benson, 2005; Glenn, Bihm, & Lammers, 2003; Hartley & Maclean, 2009). However, only a handful of studies, often consisting of single case reports, have evaluated the effectiveness of CBT for depression in adults with mild ID. These studies reported decreases in depressive symptoms following CBT (Dagnan & Chadwick, 1997; Hassiotis et al., 2013; Lindsay & Olley, 1998), when necessary adaptations were used including simplifying language, checking understanding, real life examples, and visual materials. In one of the largest studies to date, Hassiotis et al. (2013) examined the efficacy of an individualized 16 week CBT program in adults with mild to moderate ID who had symptoms of a mood disorder (depression or anxiety) as compared to a treatment as usual control group ($n = 16$). Although not statistically significant, there was a trend toward improvement in depressive symptoms based on self-report using the Beck Depression Inventory Youth (Beck Youth Inventories, 2005). Additional research is needed to build on these studies by exploring the efficacy of CBT treatments specific to depression in samples with clinically significant symptoms (i.e., met criteria for a depressive disorder). In addition to *self-reported* measures of depressive symptoms, research including *informant-reports* of depressive symptoms and measures of behaviors related to depression (e.g., co-occurring behavior problems and social skills), that are outcomes of importance to adults with ID and caregivers is needed. Adults with ID with depressive disorders are at high risk for co-occurring behavior problems (e.g., Meins, 1995; Tsiouris, Mann, Patti, & Sturmey, 2004), and these co-occurring behavior problems are often the chief complaint (Hurly et al., 2008). Adults with ID with depressive disorders exhibit problematic social behaviors (Hartley, Lickel, & MacLean, 2008), and fostering social relationships was reported as an outcome of importance for depression treatments by adults with ID with and caregivers (McCabe & McGillivray, 2012).

To date, only one group has examined the efficacy of CBT in a group format. In a sample of 21 adults with mild ID who had depressive symptoms, but did not necessarily meet criteria for a depressive disorder, McCabe et al. (2006) found that a CBT group treatment resulted in a significant reduction in depressive symptoms (average of 9 points on Beck Depression Inventory II [Beck, 1996]) as compared to a waitlisted control group, with effects maintained 3 months post-treatment. Group CBT treatments are particularly appealing as they offer opportunities to normalize the experience of depression, practice skills with peers, build social relationships, and are often more cost effective than individual therapy (Tucker & Oei, 2007). There is now a need to determine if findings can be replicated in adults with mild ID with more severe depressive symptoms (i.e., meet criteria for a depressive disorder).

Previous CBT treatments for depressive disorders have involved only the adult with ID (e.g., Dagnan & Chadwick, 1997; Hassiotis et al., 2013; McCabe et al., 2006), however, CBT treatments for other conditions (e.g., anger) in adults with ID have involved caregivers at a more minor level (Taylor, Navoac, Gillmer, Robertson, & Thorne, 2011). The inclusion of

caregivers in CBT treatments may enhance treatment effects and was voiced as being important by caregivers and mental health and disability service providers in our focus groups and interviewers (see CBT Treatment section). Specifically, by teaching caregivers about CBT they can then encourage and help the adult with mild ID use these skills within natural and real-time contexts, outside of the treatment sessions and after the treatment has ended. Indeed, CBT treatments with typically developing children often include parents, and such involvement has been shown to enhance treatment-related effects (e.g., Barrett, Duffy, Dadds, & Rapee, 2001; Mendlowitz et al., 1999). Thus, an investigation of the feasibility and efficacy of CBT group interventions that include a caregiver component is warranted.

In addition to investigating the efficacy of CBT for adults with ID, it is important to understand the mechanism of therapeutic change (Kazdin & Nock, 2003). Evidence from case studies and studies using small sample sizes indicates that behavior therapy techniques such as self-monitoring and positive reinforcement lead to improvements in mood in adults with ID (e.g., Lancioni et al., 2002; Lindauer, DeLeon, & Fisher, 1999). On the other hand, studies examining the extent to which adults with mild ID understand and can apply cognitive therapy are mixed. Dagnan et al. (2000) found that 75% of a sample of 40 adults with mild ID accurately identified emotions related to different situations, but only a subset (10 to 23%) understood the link between thoughts and emotions and situations. Similarly, Joyce, Globe, and Moody (2006) found that 50% of a sample of 72 adults with varying levels of ID correctly identified emotions based on the situation, however only 23% correctly identified an emotion based on a situation and belief and only 19% accurately identified a belief based on a situation and emotion. However, there is evidence that adults with mild ID can be taught the skills required for CBT. Following a 1 hour training session, 18 adults with mild to moderate ID demonstrated improvement on their ability to link thoughts to feelings as compared to a control group who did not receive this treatment (Bruce, Collins, Langdon, Powlitch, & Reynolds, 2010). Overall, these findings suggest that many adults with mild ID can readily learn the skills required for CBT, and should evidence improvement in these skills with treatment.

The goal of the present pilot study was to explore the efficacy of a group CBT treatment that included a caregiver component in adults with mild ID with a depressive disorder immediately post-treatment and at a 3-month follow-up. In addition to determining whether the CBT treatment lead to decreases in depressive symptoms, we sought to determine whether the treatment would lead to improvements in behaviors (i.e., co-occurring behavior problems and social skills) related to depressive disorders and that are outcomes of importance to adults with ID and caregivers. An additional goal of the present pilot study was to examine the extent to which adults with mild ID in the group CBT treatment were able to understand and apply the principles of cognitive therapy from pre- to post-treatment.

Sixteen adults with mild ID and a depressive disorder participated in a 10-week group CBT treatment and 8 adults with mild ID with a depressive disorder served as a treatment as usual (TAU) control group. Adults with mild ID and caregivers completed measures of depressive symptoms, behavior problems, and social behaviors at pre-treatment, post-treatment, and a 3-month follow-up. Adults with mild ID also completed a series of tasks to measure their understanding of cognitive therapy pre- and post-treatment. We hypothesized that adults

with mild ID in the CBT group would show decreases in depressive symptoms and behavior problems and increases in social skills from pre-treatment to post-treatment and these effects would be maintained at a 3-month follow-up. The TAU group was not expected to show changes in these outcomes. Finally, we hypothesized that the adults with mild ID in the CBT group would show increases in their ability to understand and apply the principles of cognitive therapy from pre-treatment to post-treatment.

Method

Study Design

Adults with mild ID were recruited by sending fliers to developmental disability case managers in the region. Twenty-nine adults with mild ID indicated interest and were provided with an overview of the CBT treatment. Of these adults with mild ID, 3 declined to participate. The remaining 26 adults with mild ID were administered screening procedure (described later) to ensure that they had a mild level of ID (i.e., IQ between 50 and 75 and impairments in adaptive behavior), had adequate oral communication skills (i.e., fluent verbal speakers) and currently met criteria for a depressive disorder according to the Diagnostic Manual- Intellectual Disability (DM-ID; Fletcher, Loschen, Stavrakaki, & First, 2007). Two adults with mild ID did not currently met criteria for a depressive disorder and were excluded from the study.

Studies suggest that approximately one-half of adults with ID take one or more psychotropic medications (DeKuijper et al., 2010; Lunskey & Elserafi, 2012; Tsiouris, Kim, Brown, Pettinger, & Cohen, 2013). Thus, obtaining a sample of adults with mild ID with a depressive disorder not taking psychotropic medications does not reflect the real world context. Therefore, in the current sample, the majority of adults with mild ID were currently taking psychotropic medications, but all had been on the medications at their current dosage for at least 3 months. Changes to psychotropic medications were not made during the study period. This means that we studied the added effectiveness of CBT in adults with mild ID who were partial responders to medication (i.e., had depressive symptoms despite medication). This strategy has been used in randomized control trials (RCT) in the general population (e.g., Wiles et al., 2013), and reflects a real-world approach to assessing the effects of CBT above and beyond medication.

Participants

A total of 24 adults with mild ID and a depressive disorder participated in the study; 16 adults with mild ID received the CBT group treatment (conducted in groups of 5 or 6 adults with mild ID) and 8 adults with mild ID were assigned to the TAU condition. The TAU condition was offered the CBT group intervention at a later date (3 months later). Table 1 presents the socio-demographic characteristics of study participants. Adults with mild ID ranged in age from 22 to 54 years and lived in group homes (n = 17), with family (n = 2), or by themselves (n = 5). Clinical interviews (see 'Diagnosis of Mental Health Conditions') indicated that 8 (33.33%) adults with mild ID met criteria for one or more mental health condition in addition to a depressive disorder (anxiety disorders [4], obsessive-compulsive Disorder [2], ADHD [1], alcohol use disorder in sustained remission [1], stereotypic

movement disorder [1], and schizotypal personality disorder [1]). Twenty (83.33%) of adults with mild ID were taking psychotropic medications (Abilify [n = 1], Buspar [n = 1], Depakote [n = 2], Desyrel [n = 3], Effexor [n = 1], Inderal [n = 1], Klonopin [n = 2], Lamictal [n = 1], Lunesta [n = 1], Luvox (n = 2), Neurontin [n = 10%], Prozac [n = 5], Remeron [n = 1], Risperidal [n = 2], Seroquel [n = 4], Tranxene [n = 1], Wellbutrin [n = 1], Xanax [n = 1], and Zoloft [n = 2]). Independent samples t-tests and chi-square analyses indicated that there was not a significant difference in age, gender, residence, presence of a co-occurring mental health condition, use of psychotropic medication, IQ, receptive language, or adaptive behavior between the CBT and TAU groups (Table 1).

Respondents who had weekly contact with the adult with mild ID completed measures about the adult with ID at pre-treatment, post-treatment, and a 3-month follow-up. Respondents who completed measures (3 parents, 9 case managers, and 12 staff) had known the adult with mild ID for 1 to 25 years ($M = 6.58$ $SD = 7.03$). On average, respondents were aged 44 years ($SD = 12.11$), most had at least some college education (79.16%), and the majority were Caucasian, non-Hispanic (87.5%). Independent samples t-tests and chi-square statistics indicated that there was not a significant difference in age ($t(23) = 0.85$, $p = .40$), education level (1 = high school diploma, 2 = some college, 3 = college degree, 4 = graduate degree) ($\chi^2(3, 24) = 1.89$, $p = .60$), ethnicity/race (0 = Caucasian, non-Hispanic, 1 = other) ($\chi^2(1, 24) = 1.09$, $p = .29$), or years having known the adult with mild ID ($t(23) = 1.27$ $p = .22$), between the respondents of adults with mild ID in the CBT versus TAU group.

Screening Measures

Cognitive functioning—The Stanford-Binet Intelligence Scales-Fifth Edition (SB5; Roid, 2003) was used to ensure that all participants had a mild level of ID (IQ between 50 and 75). Only the Abbreviated IQ Battery was administered. The SB5 was designed for individuals aged 2 to over 85 years. The Abbreviated IQ has a standard score mean of 100 ($SD = 15$) and has been shown to be strongly related to Full IQ scores on the SB5 and other IQ measures (Roid, 2003).

Adaptive behavior—The Vineland Adaptive Behavior Scales, Second Edition Caregiver Rating Form (Vineland-II; Sparrow, Cicchetti, & Balla, 2005) is a caregiver completed measure of adaptive behavior. The Vineland-II assesses 3 domains (Communication, Daily living skills, and Socialization) of personal and social skills needed for everyday living. The Adaptive Behavior Composite standard score was used in the present study. The Vineland-II has good psychometric properties with test-retest reliability coefficients in the .80s and .90s and inter-rater reliability coefficients in the .70s (Sparrow et al., 2005).

Diagnosis of mental health conditions—The Psychiatric Assessment Schedule for Adults with Developmental Disabilities Clinical Interview (PAS-ADD; Moss, 2002) is a semi-structured clinical interview with the adult with ID and caregivers. Symptom endorsement on the PAS-ADD was used to assess criteria for depressive disorders, as well as other mental health disorders. The PAS-ADD adheres to the DSM-IV (TR) and ICD-10 diagnostic criteria. If symptoms were described related to mental health conditions not covered by the PAS-ADD, a clinical interview was used to determine if DSM-IV (TR)

criteria was met. Final diagnostic decisions were also guided by the Diagnostic Manual-Intellectual Disability (DM-ID; Fletcher et al., 2007); this manual is intended to facilitate accurate diagnosis of mental health conditions based on the DSM-IV (TR) by providing details on how to apply diagnostic criteria to individuals with ID. All participants meet criteria for a depressive disorder based on the PAS-ADD.

Receptive vocabulary—The Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4; Dunn & Dunn, 2007) was used to measure receptive vocabulary language. The PPVT-4 has been used in adults with mild to moderate ID and has excellent test-retest reliability and concurrent validity with this population (Dunn & Dunn, 1981; Lewis, Freebairn, Heeger, & Cassidy, 2002). The standard score were used in the present study.

Training Procedure for Self-Reported measures with Adults with mild ID

At the beginning of the pre-treatment, post-treatment, and 3-month follow-up assessments, a training procedure was conducted to teach adults with mild ID how to reliably use our likert-type scales (Hartley & MacLean, 2005, 2009). In the first step, adults with mild ID were asked to designate size-order relations among a set of clear containers with varying amounts of colored water. In the second step, adults with mild ID were required to relate the correct container to verbal descriptors (“no”, “a little”, “medium”, and “a lot”) and a numerical scale of size (1-4). Finally, adults with mild ID, who had previously been asked to identify their favorite and least favorite food item, were asked to correctly indicate where their favorite and least favorite food fell on a scale of preference (“no”, “a little”, “medium”, and “a lot”). Two participants in the present sample did not successfully complete all steps in this procedure the first trial. In these cases, demonstration and explanation was provided. Both participants successfully completed all steps in a second trial.

Pre-treatment, Post-Treatment, and 3-month Follow-up Measures

Depressive symptoms—Two measures of depressive symptoms were used, one self-report and one caregiver-report. The Self-Report Depression Questionnaire (SRDQ; Reynolds & Baker, 1988), a 32-item self-report measure of depressive symptoms developed for individuals with ID. Items are rated on a 3 point scale from 0 (‘Not at all’) to 2 (‘Most of the time’); total scores range from 0 – 64 points. The SRDQ has been found to have strong psychometric properties in samples of adults with mild ID, including test-retest reliability of .63 to .71, internal consistency of .89 to .90 and evidence of construct and criterion-related validity (Esbensen & Benson, 2005; Reynolds & Baker, 1988). The Caregiver version of the Glasgow Depression Scale for People with a Learning Disorder (GDS-LD; Cuthill, Espie, & Cooper, 2003), a 16-item informant report of depressive symptoms in adults with ID, was administered to caregivers. Items are rated on a 3 point scale from 0 (‘Not at all’) to 2 (‘Extremely’), such that total scores range from 0 – 32 points. The GDS-LD has been shown to be able to differentiate adults with ID with and without a depressive disorder and has good test-retest reliability (Cuthill et al., 2003). Higher scores on the SRDQ and GDS-LD indicate a higher level of depressive symptoms.

Behavior problems—The Scales of Independent Behavior-Revised Problem Behavior Scale (SIB-R; Bruininks, Woodcock, Weatherman, & Hill, 1996) is an informant-completed

assessment of eight behavior problems (hurtful to self, destructive or hurtful to others, disruptive behavior, unusual or repetitive behavior, socially offensive behavior, withdrawn or inattentive behavior, and uncooperative behaviors) in individuals with ID. The SIB-R has been shown to have excellent reliability and validity (Bruininks et al., 1996) and high convergent validity in samples of adults with developmental disabilities (Greenberg et al., 2006). The total severity SIB-R score (i.e., summed severity scores for behavior problems reported to be present) was used in all analyses, such that higher scores indicated more severe behavior problems.

Social skills—The Social Performance Survey Schedule (SPSS; Matson et al., 1983) is a 57 item informant-rating of social skills developed for adults with mild to moderate ID. Items are rated on a five-point Likert-type scale ranging from ‘not at all’ to ‘very much’. The SPSS has strong internal consistency and interrater reliability (Matson & Hammer, 1996) and is sensitive to symptoms of psychopathology (Matsonm Anderson, & Bamburg, 2000). The total SPSS score was used in all analyses, such that higher scores indicate more adaptive social skills

Cognitive therapy components—Understanding and application of cognitive therapy was assessed using: 1) The Emotion Recognition Task (ERT) that required participants to identify emotions (happy, sad, fear, anger, disgusted, and surprised) using the Pictures of Facial Affect system (Ekman & Friesen, 1976). Pictures were represented in 2×3 inch black and white photographs and included both male and female Caucasian faces. An emotion word was read (e.g. “Sad”) and the participant was asked to identify which of the six faces represents the word. 2). The Thought/Feeling/Behavior Discrimination Task (TFB; Oathamshaw & Haddock, 2006) was developed for adults with ID and assesses the ability to differentiate thoughts, feelings, and behaviors. The TFB consists of 24 sentences. Items were read aloud and participants are asked if the sentence is “something you do,” “something you think,” or “something you feel.” 3). The Cognitive Mediation Task (CMT; Dagnan et al., 2000) was also developed for adults with ID and requires participants to infer emotions or beliefs based on various situation-thought-emotion pairings. An example scenario is “You walk into a room and your friends start laughing....and you feel happy. Would you be thinking my friends are nice or my friends are mean?” Positive and negative scenarios are counterbalanced across participants.

Treatment Groups

CBT treatment—Our group CBT treatment program, Empower, was created based on review of CBT treatments for typically developing children (Penn Resiliency Program [Gilliam et al., 2006] and Treatment for Adolescents with Depression Study [Brent & Poling, 1997]) and a program developed for adults with mild ID (McCabe et al., 2006). In addition, we conducted focus groups and interviews with 17 adults with mild ID, 3 parents of adults with mild ID, and 28 disability service staff or mental health providers in the field of ID and feedback was used to design intervention. A major theme from the focus groups and interviews was that caregivers should be involved in treatment to learn how to support adults with ID with depressive disorders and to ensure that the adult with ID continues to employ the skills learned in treatment sessions outside of the sessions and when the

treatment is over. Other themes included transportation to sessions and materials that are transportable between place and among caregivers (e.g., binders and clear instructions). Even the treatment name, Empower, was recommended by a disability service provider, as it conveys the idea that we are empowering adults with ID with skills. Input on treatment activities was also solicited; recommendations centered on making activities more feasible (e.g., using pictures from magazines as opposed to adults with ID draw, room to accommodate large handwriting) and making information meaningful (e.g., using term “feel happy: as opposed to “treat depression”, and having adult with ID identify personal goals). A treatment manual was created.

Empower is implemented through 1.5 hour weekly meetings for 10 weeks and was run by 1 lead therapist (clinical psychologist) and 2 to 3 co-facilitators (graduate students). The number of sessions exceeds the minimum number of sessions ($n = 8$) needed to obtain clinically significant treatment effects in typically developing children (Barkham et al., 1996). Each adult with mild ID identified a caregiver to attend sessions. This caregiver was the same person who served as the respondent on study measures for 12 of the 14 adults with ID in the CBT group. Caregivers: 1) learned about CBT and the rationale behind activities, 2) supported the adult with ID with activities during treatment sessions (e.g., sat by them and guided them in completing worksheets aimed at identifying emotions and thoughts and their connections), 3) were given instructions for how to support the adult with ID in homework assignments and in-between sessions. Empower treatment components are displayed in Table 2.

Treatment as usual (TAU)—Participants in the TAU condition received the array of usual care services, including case management ($n = 8$; 100%) and support from direct care staff ($n = 8$; 100%). The majority ($n = 7$; 87.5%) of adults with mild ID in the TAU group were taking psychotropic medication.

Data Analysis Plan

Descriptive Data and Treatment Fidelity—The mean, standard deviation, median, range, minimum, and maximum and boxplots and histograms for study measures were examined. Treatment compliance (i.e., session attendance and completion of homework) was assessed.

Treatment Outcomes—Analyses were then conducted to determine if adults with mild ID in the CBT group evidenced greater change in the dependent measures from pre-treatment to post-treatment and the 3-month follow-up than the adults with mild ID in the TAU group. The dependent measures were self-reported depressive symptoms (SRDQ), caregiver-reported depressive symptoms (GDS-LD), social behaviors (SPSS), and behavioral and emotional problems (SIB-R). A multivariate analysis of variance (MANOVA) was first conducted to determine if there were differences between the CBT and TAU groups at pre-treatment in the dependent measures. Next, repeated measures MANOVAs were separately conducted to determine the effect of *time* (pre-treatment, post-treatment, and 3-month follow-up) and *group* (CBT vs. TAU) on each dependent variable.

The Bonferroni adjusted alpha level of 0.013 was used to judge statistical significance. Post hoc Bonferroni comparisons were conducted to identify the *time* and *group* effects.

Analyses were also conducted to determine whether the adults with mild ID in the CBT group learned and were able to apply cognitive therapy principles. In these analyses, the three dependent measures were the ERT, TFB, and CMT. We first conducted a MANOVA to determine if there were differences between the CBT and TAU groups at pre-treatment in these measures. Next, repeated measures MANOVAs were separately conducted to determine the effect of time (pre-treatment to post-treatment) and group (CBT vs. TAU) on each measure. The Bonferroni-adjusted alpha level of 0.017 was used to judge statistical significance. Post hoc Bonferroni comparisons were used to understand the *time* and *group* effects.

Results

Descriptive Data and Treatment Fidelity

Distributions of study variables (kurtosis and skewness) indicated a normal distribution of data without skew for SRDQ, GDS-LD, SPSS, and SIB-R. Data were moderately positively skewed for the ERT and TFB, and negatively skewed for the CMT. Given this skew, square-root transformations were performed as recommended by Tabachnick and Fidell (2007) for these variables and used in all analyses. Multicollinearity of variables was assessed and variance inflation factors for variables were never larger than 1.6.

Session attendance by the adults with mild ID in the CBT group was high, ranging from 70.0% to 100% ($M = 93.1\%$, $SD = 9.5\%$). Reasons for adults with mild ID missing sessions included illness, problems with transportation, and previously scheduled appointments. The majority ($n = 13$) of caregivers attended the majority (60%) of sessions, such that the overall mean of sessions attended by caregivers was 85.9% ($SD = 23.9\%$). Reasons for caregivers missing sessions included work or scheduling conflicts. Completion of homework by the adults with mild ID ranged from 77.8% to 100% ($M = 94.9\%$, $SD = 9.1\%$).

Treatment Outcomes

Table 3 presents the means and standard deviations for the four outcomes (SRDQ, GDS-LDS, SPSS, and SIB-R) in the CBT and TAU groups at pre-treatment, post-treatment, and the 3-month follow-up. A MANOVA was performed to compare the pre-treatment SRDQ, GDS-LDS, SPSS, and SIB-R scores of the CBT and TAU groups. The MANOVA was not significant ($F(4, 19) = 0.36$, $p = .83$, partial $\eta^2 = 0.07$), indicating that there was not a significant difference between the CBT and TAU groups in these outcomes at pre-treatment.

Repeated measures MANOVAs were separately performed to examine change in each outcome across *time* (pre-treatment, post-treatment, and 3-month follow-up) by *group* (CBT vs. TAU). Post-hoc Bonferroni comparisons were used to identify *time* and *group* differences. There was a significant effect of *time* on SRDQ ($F(2, 21) = 8.57$, $p = .01$, partial $\eta^2 = 0.44$). *Time* also interacted with *group* to predict SRDQ ($F(2, 21) = 7.32$, $p = .01$, partial $\eta^2 = 0.40$). Bonferroni follow-up comparisons indicated that effect of *time* was limited to the CBT group. In the CBT group, the pre-treatment SRDQ scores were

significantly higher than the post-treatment score and the 3-month follow-up score, indicating an effect of the treatment. There was not a significant difference from post-treatment to the 3-month follow-up in the CBT group, indicating that treatment effects were sustained. In the TAU group, there was not a significant difference among the pre-treatment, post-treatment, and 3-month follow-up SRDQ scores.

There was a significant effect of *time* on GADS-LD ($F(2, 21) = 23.02, p < .001$, partial $\eta^2 = 0.69$). Again, *time* interacted with *group* to predict GADS-LD ($F(2, 21) = 16.74, p < .001$, partial $\eta^2 = 0.60$). In the CBT group, Bonferroni-corrected follow-up comparisons indicated that the pre-treatment GADS-LD score was significantly higher than the post-treatment and the 3-month follow-up score. There was not a significant difference from post-treatment to the 3-month follow-up in the CBT group; this indicates that the benefit of the treatment was sustained over the 3-month period. In the TAU group, there was not a significant difference among the pre-treatment, post-treatment, and 3-month follow-up GADS-LD scores.

There was a significant effect of *time* on SIB-R ($F(2, 21) = 6.11, p = .01$, partial $\eta^2 = 0.37$); thus, overall, from pre-treatment to the 3-month follow-up there was an average linear decline in SIB-R scores. *Time* interacted with *group* to predict SIB-R ($F(2, 21) = 5.98, p = .01$, partial $\eta^2 = 0.36$). In the CBT group, Bonferroni follow-up comparisons indicated that the post-treatment and 3-month follow-up SIB-R scores were significantly lower than the pre-treatment SIB-R scores. In contrast, there was not a significant difference in the pre-treatment, post-treatment or 3-month follow-up SIB-R scores in the TAU group.

In contrast, there was not a significant effect of *time* on SPSS ($F(2, 21) = 1.84, p = .18$, partial $\eta^2 = 0.15$). Similarly, *time* did not interact with *group* to predict SPSS ($F(2, 21) = 1.84, p = .18$, partial $\eta^2 = 0.15$). Thus, there was no difference between groups and there was not an effect of the treatment from pre-treatment to post-treatment or follow-up in social behaviors.

Table 4 presents the means and standard deviations for the three measures of the cognitive therapy principles (ERT, TFB, and CMT) at pre-treatment and post-treatment in the CBT and TAU groups. The square-root transformed scores were used for the ERT and TFB variables. A MANOVA was performed to compare the pre-treatment scores on the ERT, TFB, and CMT between the CBT and TAU groups. The MANOVA was not significant ($F(3, 20) = 1.83, p = .17$, partial $\eta^2 = 0.22$). Repeated measures MANOVAs were then separately performed to examine change in the ERT, TFB, and CMT across *time* (pre-treatment, post-treatment, and 3-month follow-up) by *group* (CBT vs. TAU). There was a significant effect of *time* on ERT ($F(1, 22) = 7.20, p = .01$, partial $\eta^2 = 0.25$). There was not a significant interaction between time and group ($F(1, 22) = 0.64, p = .43$, partial $\eta^2 = 0.03$). Thus, both the CBT and TAU groups demonstrated improvement on the ERT task from pre-treatment to post-treatment. Similarly, there was a significant effect of *time* on TFB ($F(1, 22) = 10.05, p < .01$, partial $\eta^2 = 0.31$) and not a significant interaction between *time* and *group* ($F(1, 22) = 4.42, p = .05$, partial $\eta^2 = 0.17$). Thus, both the CBT and TAU groups demonstrated improvement on the TFB task from pre-treatment to post-treatment. In contrast, there was a significant effect of *time* on CMT ($F(1, 22) = 33.93, p < .01$, partial $\eta^2 = 0.61$). There was also a significant interaction between *time* and *group* ($F(1, 22) = 11.63$,

$p < .01$, partial $\eta^2 = 0.35$) on CMT. Bonferroni follow-up comparison indicated that the CBT group, but not the TAU group, demonstrated improvement from pre-treatment to post-treatment in the CMT.

Discussion

Despite evidence that adults mild ID have an increased prevalence of depressive disorders (Richards et al., 2001; Maughan et al., 1999), there is a paucity of research on the effectiveness of psychosocial treatments for depression in this population. In our pilot study, we found that adults with mild ID who received a 10-week group CBT treatment with a caregiver component demonstrated significant decreases in depressive symptoms (both self-reported and caregiver reported) and behavior problems from pre-treatment to post-treatment. Moreover, these effects were maintained at a 3-month follow-up. In contrast, adults with mild ID in the TAU group did not exhibit changes in their level of depressive symptoms or behavior problems during this same period. These findings support previous research indicating that CBT provided in a group format can be an effective intervention for adults with ID (McCabe et al., 2006). In contrast to studies without caregivers (e.g., Hassiotis et al., 2013), this study involved caregivers and this may have contributed to treatment effects.

Unexpectedly, the CBT group did not demonstrate significant change in their social skills from pre-treatment to post-treatment. Adults with mild ID with depressive disorders exhibit social behaviors that often lead to negative and rejecting reactions by others (Hartley, Lickel, & MacLean, 2008). The fact that the CBT group treatment did not result in increases in adaptive social behaviors may mean that these behaviors need to be specifically targeted within CBT programs. Further research should investigate whether including a structured social skill training component may further enhance the effect of CBT programs on depressive symptoms in adults with mild ID. Our measure assessed social skills broadly, and thus it is also possible that changes in the more narrow set of social behaviors related to depressive disorders may also been overshadowed. However, despite not impacting social behaviors, significant and long-lasting improvements in depressive symptoms following the CBT group treatment were found.

Our findings suggest that cognitive therapy components were, at least in part, driving changes in depressive symptoms and behavior problems. Adults with mild ID in the CBT group demonstrated significant improvements in their ability to infer emotions and thoughts based on various situation-thought-emotion pairings from pre-treatment to post-treatment. In contrast, the TAU group did not demonstrate change on this task. Both the CBT and TAU groups demonstrated improvement on their ability to identify emotions and distinguish between thoughts, feelings, and behaviors from pre-treatment to post-treatment. The lack of a group effect on the ERT and TFB tasks may be due to a ceiling effect; adults with mild ID scored high on these tasks at pre-treatment. It may also be that our CBT treatment was most closely aligned with teaching adults with mild ID the connection between thoughts, feelings, and behaviors. Further research should continue to examine mechanisms of therapeutic effect of CBT possibly by including a behavioral therapy only condition in addition to a CBT condition in a RCT.

There were several strengths to the present pilot study. We included adults with mild ID who had a *verified* current depressive disorder. Moreover, adults with mild ID were also screened for other mental health conditions. Comorbidity in mental health conditions is common in adults with ID (Cooper et al., 2007), and thus including participants with multiple mental health conditions makes our study reflective of the population. On the other hand, this comorbidity may have reduced the effectiveness of the CBT intervention. The majority of adults with mild ID in the study were taking psychotropic medications, yet continued to display depressive symptoms. This approach means that findings may better reflect real-world context, as research indicates that only *one-half* of adults with ID with a depressive disorder respond fully to anti-depressants (Trivedi et al., 2006). One strength of the CBT treatment was that it was developed using input from adults with ID, caregivers, and mental health and disability service providers. Moreover, we also included a caregiver component as a means to educate caregivers on depression and teach them how to support adults with mild ID in using strategies outside of treatment sessions. Although the present study is not able to determine the added benefit of the caregiver component, feedback from participants indicated that this was a valued and critical component of treatment effects. Future studies should compare CBT with versus without a caregiver component to fully understand the extent to which caregiver involvement enhances treatment effects in adults with mild ID.

The present study is also not without limitations. Although 24 adults with mild ID is relatively large sample relative to previous studies of CBT in adults with ID (Dagnan & Chadwick, 1997; Lindsay et al., 1998), this is still a small sample. Moreover, group assignment was not fully randomized. This study should be followed up with a larger RCT. The study is also limited in that outcome variables were reported on by caregivers who participated in the CBT treatment; in future studies, ratings of outcome measures should be made by informants who do not participate in the CBT treatment and are blind to treatment condition (CBT versus TAU group). In addition, 3 of the adults with mild ID and 4 of the caregivers involved in the study also provided input on the development of the treatment prior to participating in the study; this involvement may have influenced the extent to which materials were understood and accepted by participants. It is important for future research to include a comparison group intervention (e.g., social skills group) in order to control for the effect of being involved in a group intervention when examining the efficacy of group CBT treatments. In addition, because the present study was largely based on adults with mild ID who were taking psychotropic medications, we do not know the effectiveness of CBT as a first-line treatment in adults with ID. It should also be noted that although session attendance and completion of homework by participants was relatively high, not all participants received the full 'dose' of the treatment. Future studies should assess the impact of the CBT on caregivers themselves (e.g., on their level of caregiving stress and affect), as caregiver outcomes were not examined in the present study.

Our pilot work establishes preliminary evidence for the effectiveness of a group CBT intervention involving a caregiver component for depression in adults with mild ID. Next steps are to evaluate moderators of these treatment effects. Future research should identify the individual and caregiver support factors that moderate the effectiveness of CBT

treatments. For instance, a certain level of understanding of cognitive therapy principles may be required at the onset of treatment to benefit from CBT. In addition, cognitive and language skills and certain co-occurring mental health conditions may impact the effectiveness of CBT. Finally, level of caregiver support has been identified as a potentially important determinant of treatment effectiveness (Esbensen & Hartley, 2012; Taylor et al., 2010), but has yet to be examined.

In summary, findings indicate that adults with mild ID with a depressive disorder benefitted from a group CBT treatment with a caregiver component; they evidenced fewer symptoms of depression and behavior problems following the treatment and these effects were maintained at a 3-month follow-up. Moreover, the group CBT treatment led to significant increases in understanding cognitive therapy principles, suggesting that adults with mild ID benefit from cognitive therapy components. Results from the present study, however, should be considered as preliminary. Further research employing a RCT is needed to examine the efficacy of group CBT in a larger sample. Research is also needed to better understanding the mechanisms of therapeutic effect, to identify moderators of treatment effects, and to examine the relative benefit of involving caregivers in treatments.

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Table 1

Characteristics of Adults with Mild Intellectual Disability in the Study

	CBT	TAU	
Variable	n=16	n=8	T-test/Chi-Square
Age in yrs (M[SD])	38.81 (10.92)	40.25 (11.46)	t (23) = -0.30, p = .77
Range	22-54	24-52	
Gender (n[%])			
Male	8 (50.00%)	5 (62.50%)	$\chi^2(1, N = 24) = 0.34, p = .56$
Residence(n[%])			
Family	2 (12.50%)	0 (0.00%)	$\chi^2(2, N = 24) = 1.13, p = .57$
Group home	11 (68.75%)	6 (75.00%)	
Apartment	3 (6.25%)	2 (25.00%)	
Race/ethnicity (n[%])			
Caucasian, Non-Hispanic	14 (87.50%)	8 (100.00%)	$\chi^2(1, N = 24) = 1.09, p = .30$
IQ Standard Score (M[SD])	62.38 (7.40)	61.13 (6.62)	t (23) = 0.83, p = .69
Range	50-73	52-72	
PPVT Standard Score (M[SD])	71.06 (8.39)	71.37 (6.14)	t (23) = -0.93, p = .93
Range	49-81	79-62	
Vineland-II Adaptive Behavior			
Composite(M[SD])	71.56 (9.09)	67.63 (7.23)	t (23) = 1.06, p = .28
Range	59-89	56-78	
Depressive Diagnosis (n[%])			
Major Depression	11 (68.75%)	6 (75.00%)	$\chi^2(2, N = 24) = 0.53, p = .77$
Depressive Disorder NOS	4 (25.00%)	2 (25.00%)	
Dysthymia	1 (6.25%)	0 (0.00%)	
Psychotropic Medication (n[%])			
Yes	13 (81.25%)	7 (87.50%)	$\chi^2(1, N = 24) = 0.15, p = .70$
Co-Occurring Mental Health (n[%])			
Yes	5 (31.25%)	3 (37.50%)	$\chi^2(1, N = 24) = 0.09, p = .76$

Note. CBT = Cognitive Behavioral Therapy. TAU = Treatment as Usual. M = Mean, SD = Standard Deviation PPVT = Peabody Picture Vocabulary Test, Fourth Edition

Table 2**Empower Components**

Session	Objectives	Activities	Homework
Session 1: Identifying Emotions	--Get to know group members --Discuss depression --Intervention overview --Learn to identify feelings	--Get-to-know-you games --Group discussions -Worksheets	--Daily Emotion and Behavior Record
Session 2: Understanding Emotions and link to behaviors	--Understand triggers of positive and negative feelings --Explain connection between feelings and behaviors/activities	Group discussions --Role play --Worksheets --Set activity goals	--Daily Emotion and Behavior Record --Behavior goals
Session 3: Coping	--Discuss relaxation as means of dealing with negative emotions -- Understand coping --Identify adaptive and maladaptive coping strategies	--Progressive muscle relaxation activity --Group discussion --Worksheets	--Daily Emotion and Behavior Record --Behavior goals --Practice relaxation
Session 4: Problem-Solving	--Learn problem-solving steps	--Group discussion --Worksheets	--Daily Emotion and Behavior Record --Behavior goals --Problem-solving worksheet
Session 5: Identifying Thoughts	-- Learn to identify thoughts	--Group discussion --Activity to identify thoughts --Worksheets	--Daily Emotion and Behavior Record --Behavior goals --Daily Thought Record
Session 6: Thoughts Drive Feelings	--Assess attribution bias for successes and failures --Examine evidence for and against automatic thoughts	--Group discussion --Role play --Worksheets	--Daily Emotion and Behavior Record --Behavior goals --Daily Thought Record
Session 7: Changing Thoughts	--Examine evidence for and against automatic thoughts -- Learn to replace negative thoughts with positive thoughts	--Group discussion --Role Playing --Worksheets	--Daily Record of Emotions and Activities --Behavior goals --Use Daily Thought Record to identify negative thoughts and then a more positive thought
Session 8: Review	--Review and practice skills	--Group Jeopardy game	--Daily Emotion and Behavior Record -- Behavior goals --Use Daily Thought Record to identify negative thoughts and then a more positive thought
Session 9: Maintenance	--Learn to recognize signs of depression and stress --Develop plan to manage symptoms	--Group discussion -Worksheets -- Create maintenance plan	--Daily Emotions and Behaviors Record --Use Daily Thought Record to identify negative thoughts and then a more positive thought
Session 10: Award Ceremony	--Foster self-efficacy --Encourage maintenance plan --Foster supportive relationships with group members	-- Group members talk about maintenance plan and are given positive feedback	

Table 3

Descriptive data (means and standard deviations) for the CBT and TAU groups at pre-treatment, post-treatment, and the 3-month follow-up in depressive symptoms, social behaviors, and behavior problems

Variable	Pre-Treatment		Post-Treatment		Follow-up	
	CBT n = 16	TAU n = 8	CBT n = 16	TAU n = 8	CBT n = 16	TAU n = 8
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
SRDQ	30.81 (2.59)	35.88 (3.66)	22.50 (2.34) ^{a,b,d}	35.38 (3.31)	22.37 (2.54) ^{a,b,f}	35.50 (3.59)
GDS-ID	19.56 (3.44)	20.13 (3.36)	13.25 (3.47) ^{a,b,d}	20.00 (4.62)	13.13 (3.81) ^{a,b,f}	18.38 (1.19)
SPSS	91.44 (21.03)	97.25 (25.77)	89.13 (19.49)	91.75 (24.19)	89.38 (5.54)	100.50 (7.70)
SIB-R	20.44 (15.58)	20.88 (18.65)	10.25 (8.34) ^a	20.88 (16.44)	12.00 (10.00) ^a	19.00 (15.14)

Note. CBT = cognitive behavioral therapy. TAU = Treatment and usual.

- ^a = significantly lower than the Pre-Treatment CBT group mean.
- ^b = significantly lower than the Pre-Treatment TAU group mean.
- ^d = significantly lower than the Post-Treatment TAU group mean.
- ^f = lower than the Follow-up TAU group mean.

Table 4

Descriptive data (means and standard deviations) for the CBT and TAU groups at pre-treatment and post-treatment on the tasks assessing cognitive theory components

Variable	Pre-Treatment				Post-Treatment			
	CBT n = 16		TAU n = 8		CBT n = 16		TAU n = 8	
	Raw	SQRT	Raw	SQRT	Raw	SQRT	Raw	SQRT
ERT	16.00 (2.07)	3.99 (0.27)	15.13 (1.96)	3.88 (0.25)	17.44 (1.15)	4.17 (0.14)	15.88 (1.55)	3.98 (0.19)
TFB	19.06 (4.75)	4.33 (0.59)	19.38 (3.58)	4.39 (0.40)	22.56 (2.68)	4.74 (0.29)	20.13 (3.68)	4.47 (0.42)
CMT	11.44 (1.86)	3.37 (0.27)	10.75 (0.89)	3.28 (0.13)	15.44 (2.10)	3.92 (0.27) ^a	11.75 (1.83)	3.42 (0.25) ^c

Note. CBT = cognitive behavioral therapy. TAU = Treatment and usual. ERT = Emotion Recognition Task TFB = Thought/Feeling/Behavior Discrimination Task CMT = Cognitive Mediation Task. SQRT = square-root transformed scores.

^a = significantly lower than the Pre-Treatment CBT group mean based on transformed scores (SQRT).

^c = significantly lower than Post-Treatment CBT group mean based on transformed scores (SQRT).