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PSYCHOSOCIAL PREDICTORS OF TREATMENT RESPONSE TO COGNITIVE-BEHAVIOR THERAPY FOR LATE-LIFE DEPRESSION: AN EXPLORATORY STUDY

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Abstract

Objective—The primary objective of this study was to examine a variety of potential predictors of response to Cognitive Behavioral Therapy (CBT) in depressed older adults.

Method—Sixty older adults with a clinical diagnosis of major or minor depression or dysthymic disorder received 12 individual sessions of CBT over a 3 to 4 month period. The BDI-II was administered pre and post intervention to assess change in level of depression. A cut-off score of 13 or less at post was used to determine positive treatment response. A variety of measures (obtained at baseline) were evaluated using hierarchical regression techniques to predict improvement following treatment

Results—Individuals who showed greater improvement were: a) more open to new experiences; b) less negatively affected by past stressors; c) less inclined to have an external locus of control but more likely to cite others as responsible for negative stress in their lives; and d) were more likely to seek emotional support when symptomatic. Lower education level and reported use of active coping strategies at baseline were associated with less improvement. Other variables (e.g., age, overall physical health, and cognitive status) were not associated with treatment response. Use of logistic regression to predict responders vs. non-responders yielded a similar pattern.

Conclusion—These findings agree with prior research confirming the effectiveness of a brief CBT intervention for older depressed persons and suggest further exploration of several psychosocial factors that may contribute to a stronger response to CBT.

Keywords

cognitive behavior therapy; CBT; depression; older adults; trauma; response predictors

Introduction

The importance of psychosocial and other factors associated with response to mental health interventions has been acknowledged for some time, but few older adult studies have focused on this issue (Kiosses, Leon, & Areán, 2011). Yet, it is generally accepted that such information could assist with treatment decision-making. For example, individuals who at baseline exhibit a known set of negative predictors of outcome with regard to a certain type of treatment could be referred for other forms of intervention with a higher likelihood of success. It is also recognized that about one-third to one-half of patients with late life depression do not appear to benefit from either antidepressant medications or psychosocial treatments (Steffens & Blazer, 2012). Thus, there is a pressing need to understand more about non-responders. Identifying significant factors associated with patient response (good or poor), and/or personalizing interventions to take account of these factors, offers new hope for delivering more effective treatments (NIMH, 2010).

Treatment optimization for late-life depression is an important public health issue for two reasons: first, the steady growth of the older adult population, and second, the negative toll that untreated depression takes on people. In 2010, 18.5% of the U.S. population was comprised of older adults ages 60 and over; which is expected to grow to 25% by 2030 (Administration on Aging, 2011). With the increasing older adult population, it is important to enhance the focus on treatment for late life depression, which affects 8–16% of all community-dwelling older adults. Prevalence estimates vary according to type of depression – for example, major depressive disorder appears to affect 1% to 4% of older persons, while estimates for dysthymia and minor depression are higher (Gum, King-Kallimanis & Kohn, 2009; Steffens, Fisher, Langa, Potter & Plassman, 2009). In addition to increasing numbers of older adults with depression, we need to recognize the negative impacts that occur when late life depression is untreated. It is associated with functional difficulties, cognitive impairment, medical co-morbidity, and mortality (Alexopoulos et al., 2002; Blazer, 2003; Ritchey, Dolcos, Eddington, Strauman, & Cabeza, 2011). These findings highlight the need to optimize available treatments.

Cognitive behavioral therapy (CBT) has been shown to be an effective, evidenced-based treatment for major depressive disorder with or without adjunctive medication (Butler, Chapman, Foramn & Beck, 2006; Driessen & Hollon, 2010). CBT is also widely-used for chronic depression and for minor depressive symptoms (Butler et al., 2006) and its efficacy with older depressed persons is well established (Gallagher-Thompson & Thompson 2007; Kiosses, Leon & Areán, 2011; Laidlaw & Pachana, 2009; Scogin et al., 2005; Shah, Scogin & Floyd, 2012;) with average effect sizes above .80 (Pinquart, Duberstein & Lyness, 2007).

Yet, not all older persons respond well to CBT: in their review Steffens and Blazer (2012) point out that in some studies, as many as half the patients did not show substantial improvement, although for the most part, a positive response rate of about two-thirds is found with CBT. These data indicate that for many participants residual symptoms remain after they have completed a typical course of treatment. This raises the key question of what factors may be contributing to poorer CBT response? Many factors are considered potential predictors of depression outcome; however, a very large sample would be needed to test all that have been identified in prior studies. We selected a set of variables of conceptual interest for consideration in exploratory analyses, as follows: social support; locus of control; certain personality factors (neuroticism, introversion and openness to experience); impact of negative life events; coping styles; overall physical health, and cognitive status.

Several studies examined the role of *social support* as a predictor for depression outcome, but few have assessed its role in treatment outcome with the older adult population. Researchers have found mixed results: for example, some studies found that subjective social support, tangible support, and size of social network are separate predictors of depression outcomes (Bosworth, Hays, George, & Steffens, 2002; Bosworth, McQuoid, George, & Steffens, 2002; George, Blazer, Hughes, & Fowler, 1989), while others found that poor social support and pre-treatment social functioning factors may not contribute to poorer depression outcomes (Carter et al., 2011; Lenze et al., 2001). These mixed findings encouraged us to examine the role of social support as a possible predictor of CBT outcome in our study.

We also examined the role of several indices of *locus of control* on depression outcome. This construct describes how an individual assesses where the control over both positive and negative events lie. Rotter (1966) distinguished between external locus of control (control is assigned outside the individual's sphere of influence) and internal locus of control (the person believes he/she has control over a particular situation or event). Although this has not been examined as a predictor of treatment response following CBT for late-life depression, prior studies with other populations suggest that internal locus of control may be associated with better treatment outcomes (Canton et al., 2007).

Personality traits have been studied as risk factors for depression. High neuroticism with low extraversion, low openness to experience, and conscientiousness are often associated with higher levels of depression (Weber et al., 2012). Several studies found that high neuroticism (in particular) predicted poor outcomes, whereas low neuroticism with high extraversion and conscientiousness predicted favorable response to treatment (Bagby et al., 2008; Mulder, 2002; Ogrodniczuk, Piper, Joyce, McCallum & Rosie, 2003; Quilty et. al., 2008). However, such factors have not been widely studied in older adults.

Several studies have examined *stress, resilience, and past trauma* as possible predictors of treatment outcome (Kim, et al, 2011; Riedel et al., 2011) but were not focused on older adults. Other recent studies found that clients who have higher resilience, lower trait anxiety, and longer treatment duration were more likely to benefit from therapy (Fava & Tomba, 2009; Min et al., 2012). To date, no studies on CBT for late life depression could be found that included stress, past trauma, and resilience as predictors of treatment response.

Coping style has not been used widely as a response predictor in prior research, although conceptually it would seem reasonable that being able to use more adaptive coping styles would be associated with better CBT outcomes (Carter, 2011). Change in coping style has been an outcome measure in some studies that used CBT with dementia family caregivers (Gallagher-Thompson et al., 2003) and its use in outcome research recommended (Thompson et al., 2001).

Additional factors that may complicate the older person's ability to respond well to CBT include *poor physical health and/ or compromised cognitive status* (Alexopoulos et al, 2002; Pinquart et al., 2007; Kiosses et al., 2011). Prior research by Alexopoulos and colleagues on the impact of reduced cognitive function on response to treatment for depression is well known (Alexopoulos et al., 2005; Alexopoulos et al., 2011).

Our summary of prior research leads us to hypothesize that the following variables may be significant predictors of positive response to CBT treatment for late-life depression: a higher levels of social support; b, greater internal locus of control; c, lower neuroticism; and d, higher extraversion and openness to experience. We will also examine the possible role of impact of negative life events and coping styles, along with demographic factors such as age, ethnicity, education, and health and cognitive status.

Methods

Participants

A total of 60 depressed older adults (37 women and 23 men) age 60 and above participated in the 12-week CBT intervention over a 3 -4 month period, called the Positive Experience Project (PEP). As shown in Table 1, the mean age of this group was 69.7 (SD=7.4) with a range from 60 to 88. Mean education level was 14.3 years (SD=1.9) with a range from 4 to 17 years. Twenty-two participants (37%) were married; 47% lived alone; the majority (70%) were either retired or currently not employed; and about half (52%) had an income of less than \$40,000. In terms of race, there were 48 White participants (80%) with the remainder being either Black (5%, n=3), Asian (10%, n=6) or American Indian (5%, n=3). With regard to ethnicity, 10% identified as Hispanic/Latino (n=6). Thus, overall, this was a more diverse sample of older adults than has been typical in prior late life depression outcome research studies.

Procedures

The Stanford University School of Medicine institutional review board (IRB) approved the study in 2010, IRB protocol id#19532. Participants were recruited throughout the San Francisco Bay Area, via radio, newspaper and internet advertisements, flyers, free talks in senior centers, and through referrals from other professionals. All were phone screened and gave verbal consent in accordance with IRB regulations. Participants who scored 5 or above on the Patient Health Questionnaire—9 (PHQ-9, Kroenke, Spitzer, & Williams, 2001) were invited to complete a more detailed assessment interview that included the Mini-International Neuropsychiatric Interview (M.I.N.I; Sheehan et al., 1998), a demographic questionnaire and several self-report scales designed to measure self-reported depression, personality characteristics, locus of control, social support and current impact of past stressful events. All who participated in this second screening gave written consent to participate in the study. Those who met diagnostic criteria for major or minor depression or dysthymic disorder and scored 16 or above on the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), were invited to participate in PEP. Exclusionary features included: presence (or recent history) of psychosis or bipolar disorder, being actively suicidal or substance abusing, or showing frank evidence of dementia or severe focal cognitive impairment. Participants also had to be English speaking and willing/able to undergo fMRI and neuropsychological testing, since the primary aim of the PEP study was to examine neurophysiological and neuropsychological predictors of treatment response. These findings are presented in separate papers and are not discussed here.

Treatment

Participants underwent a structured CBT therapeutic program based on intervention manuals developed and validated in prior research (Gallagher-Thompson & Thompson, 2010; Thompson et al., 2010). They received 12 individual sessions of CBT over a three to four month period, focusing on teaching a variety of cognitive and behavioral skills, including behavioral activation, cognitive restructuring, relaxation techniques, and communication skills. CBT was provided by postdoctoral and advanced pre-doctoral clinical psychology graduate students. They were trained in the protocol for 3 months and then were monitored during group supervision by the licensed clinical psychologists (LWT, RPR and DGT) (using digital recordings of each session) for protocol adherence and CBT competency. Only those trainees who passed the initial training and were judged as adequately following the protocol (with “practice cases” not used in the study), served as therapists in the study. Continuous monitoring of therapists’ competency and adherence to the protocol occurred throughout the study, with weekly feedback provided to the interventionists. The therapists were adherent to the CBT model 75% of the time.

Following completion of CBT, a post assessment was conducted, consisting of repeating the MINI interview (to assess current diagnostic status) and completion of the BDI-II and several of the psychosocial measures collected at baseline. Anyone who was still symptomatic or reporting moderate or severe depressive symptoms at post evaluation was referred for additional services.

Measures

A variety of measures were administered assessing depression, impact of stressful events, social support, locus of control, personality, coping styles, and health and demographic information, including years of education, age, ethnicity/race, and health and cognitive status.

Depression Measures—Two were used: one to establish the diagnosis and the other to assess symptom severity. The diagnostic interview used was the Mini-International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998), which assesses Axis I disorders from the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) and International Classification of Diseases-10 (ICD-10). The M.I.N.I. inquires about 19 disorders divided up into modules, asking mainly “yes” or “no” questions of the participant. At the end of each module, the interviewer determines whether diagnostic criteria are met for that disorder. Training in administration and scoring was initially provided by its developers. Performance was monitored by the PI until research staff met criteria of accurate diagnostic categorization, as determined by review of audio-taped practice interviews by the project PI, who independently rated a sub set of the same older individuals as the trainees. Agreement on diagnoses was obtained on approximately 75% of the interviews (n=45). Disagreements were conferenced and a consensus diagnosis was then used. This process was done for both baseline and post treatment interviews. Of prime interest in this study were diagnoses related to depressive symptomatology (i.e., major depression, dysthymic disorder, and minor depression including mixed depression/ anxiety or adjustment disorder with depressed mood).

Severity of depression was measured by the BDI-II (Beck, Steer & Brown, 1996), which is a 21-item self-report measure, that assessed level of somatic and psychological depressive symptoms (e.g. pessimism, guilt, sadness, sleep and appetite disturbance, etc.) in the past two weeks. Frequency/intensity of each symptom is rated on a Likert scale ranging from 0 to 3, with higher scores indicating higher levels of depression. A total score of 0 to 13 indicates minimal depression; 14 to 19 indicates mild depression; 20 to 28 indicates moderate

depression; and 29 to 63 indicates severe depression (Beck et al., 1996). Recently, Segal et al. (2008) found that internal consistency, convergent validity, and discriminant validity of the BDI-II were strong for older adults. Internal consistency of the measure in this study was high (Cronbach's $\alpha = .88$).

Health and Cognitive Status Predictors—The SF-12 was used to assess self-reported physical health and health behaviors (Ware, Kosinski & Keller, 1996). It has 12 questions on two primary scales assessing physical or mental health. There are eight subscales (4 for each component). The physical health total score is based on its 4 subscales: physical functioning, pain, role infringement due to health problems, and perceived general health (Lenze et al., 2001). Normative data exist by age and gender; it is widely used in many kinds of research to get a quick estimate of the person's overall health.

To screen for cognitive status, the Mini-Mental Status Examination was used (Folstein, Folstein & McHugh, 1975). It is a 30-item tool that assesses orientation, registration, attention and calculation, recall, and language, requiring 5 – 10 minutes to complete. A cut-off score of 25 or less is often used to suggest presence of cognitive impairment from any cause, although scoring is affected by both age and education (Crum, Anthony, Bassett & Folstein, 1993).

Psychosocial Predictors

1. Social support: The Abbreviated Duke Social Support Index (DSSI) is an 11-item measure that was used to assess perceived social support (Koenig et al., 1993). The scale consists of two subscales, social satisfaction and social interaction. For older adults, Cronbach's alphas were 0.76 and 0.71, respectively according to recent work by Powers, Goodger and Byles (2004). This study's Cronbach alpha was similar at 0.80. Questions include: how many people the person can depend on or feels close to, whether friends and family understand the person, and whether he/she feels heard by friends and family.
2. Locus of Control was measured based on Rotter's Locus of Control theory (1966). Participants were asked to record the most stressful issue that they were dealing with at baseline and then to appraise the situation against external and internal locus of control items, such as "I have the ability to control or change this situation," and "someone else is responsible for this situation." Each item was rated on a five point likert scale from "strongly disagree" to "strongly agree." Prior studies have measured similar concepts using the Multidimensional Locus of Control Scales, (Levenson & Miller, 1976; Joiner, 2007).
3. Personality: Three subscales of the Big Five Inventory (BFI) (John, Naumann & Soto, 2008) were used to assess Neuroticism (8 items), Introversion/Extraversion (8 items), and Openness to Experience (10 items). Responses were scored from one (disagree strongly) to five (agree strongly). All questions began with, "I am someone who..." and the responses included: is talkative, is curious about many different things, is full of energy, and can be moody, etc. Internal consistency and convergent validity of the BFI with other established measures of personality has been established in previous work (Benet-Martínez, V., & John, O. P. ; John et al., 2008). Cronbach's alphas were 0.87, 0.86, and 0.83 for Neuroticism, Extraversion, and Openness respectively in this study.
4. Impact of Events:
 - a. Elders Life Stress Inventory (ELSI) (Aldwin, 1990) was designed specifically for use with geriatric populations. The ELSI measures the

stressfulness of life events experienced. The ELSI contains 31-items, 16-items cover family related stresses, including relationship disruption, marital problems and retirement; and 12 are self-related, including health, work, and finances. Respondents were asked to verify whether they had these experiences in their histories and to rate how stressful the experience was. The scoring of the ELSI can be reported as summed items (a count of number of events) or as summed ratings, (Aldwin, 1990).

- b. Impact of Events Scale -6 (IES-6) is a short form of the IES (Thoresen et al., 2010; Weiss, 2004) that assesses posttraumatic stress symptomatology. In the IES-6, distress severity is rated on a five-point scale of “not at all” to “extremely” during the past seven days. Two items measure intrusion, two items measure avoidance, and two items measure hyperarousal. Higher scores indicate greater distress. This brief version has been shown to correlate highly with the full version of the IES-R ($r = .95$; Thoresen et al., 2010).
 - c. The Integration of Stressful Life Event Scales (ISLES) is a 16-item measure used to assess the extent of the integration of a stressful life event into an individual’s broader life narrative (Holland, Currier, & Coleman, 2010). Items are rated on a 5-point scale, from 1 (totally disagree) to 5 (totally agree). Higher scores on the ISLES are associated with more positive world assumptions about benevolence and self-worth. The total items showed good internal consistency ($\alpha = .92$ and $.94$ in general stress and bereaved samples, respectively) and good convergent validity with similar measures, (Holland, Currier, & Coleman, 2010).
5. Coping: The Brief Coping (Carver, 1989) is a shortened version of the COPE inventory (Carver, Scheier & Weintraub, 1989). It contains fourteen 2-item scales with internal consistency levels ranging from $.50$ to $.82$. Items describe specific behaviors called upon to address a problematic situation, e.g. “I’ve been thinking hard about what steps to take.”, and options for participants to select range from 0 (“I haven’t been doing this at all”) to 3 (“I’ve been doing this a lot.”). We selected 3 subscales to include: Active Coping, Denial and Emotional Support.

Results

CBT Outcomes for Depression

All participants met criteria for a diagnosis of major depressive disorder (MDD), dysthymic disorder, or minor depressive disorder at the beginning of the study according to M.I.N.I criteria. At the post evaluation interview, 67% ($n=40$) had made significant clinical improvement: 29 were in full remission and 11 others improved in terms of having a lesser diagnosis at post compared to baseline. The remaining 20 (33%) still met criteria for some type of depressive disorder. These findings are generally consistent with prior CBT studies, (Steffens & Blazer, 2012; Shah et al., 2012; Thompson et al., 2001).

Table 2 shows pre- and post-intervention means and standard deviations for BDI-II grouped according to gender. There was a significant decline in the level of depressive symptoms over the course of CBT ($t(df=59) = 7.54$; $p < .000$). Women had higher mean scores than men at baseline ($F(1,58 \text{ df}) = 5.3$; $p = .026$) and at post ($F(1,58 \text{ df}) = 4.82$; $p = .032$), but the gender by treatment interaction effect was not significant ($F(1,58 \text{ df}) = 0.02$; $p = .905$) indicating that both men and women responded comparably to the treatment protocol. A cut-off score of 13 or less indicates the non-depressed range and was used to define full responders to treatment. There were 35 (58%) participants classified as “full responders” on this measure.

Identifying Psychosocial Predictors of CBT Outcome

Using SPSS 15.0, a hierarchical regression was completed to identify the contribution of the various predictor variables included in this study. Table 3 provides a summary of the two steps entered. Baseline BDI-II was entered in Step 1 which accounts for roughly 40% of the post-treatment BDI-II scores ($F(df\ 1,58) = 40.771, p = .000$). In Step 2 the psychosocial variables were added. The increase in variance explained was nearly 30% ($F(df\ 18,40) = 2.229, p = .017$). Table 4 shows the coefficients and level of significance for the variables included in both steps. There was no evidence of problems with multicollinearity, normality or homoscedasticity. Six predictors were significant at the $p < .05$ and two show trends ($p < .10$). As expected the baseline BDI-II was highly significant ($p = .0001$). Participants who report that the negative impact of stressful events is high do not respond as well to treatment ($p = .006$). Individuals who make high use of emotional support in coping with stressful situations are more likely to benefit from treatment than those who do not ($p = .007$). Individuals inclined toward an external locus of control have a poorer response to therapy ($p = .016$), but on the other hand individuals who tend to assign blame for a stressful event to someone else are more likely to benefit from treatment than those who do not ($p = .015$). The personality characteristic of openness also is associated with lower post-treatment levels of depressive symptoms. Finally the two trends observed are that persons with lower educational levels have higher post-treatment scores ($p = .061$), and curiously those who report using active coping at baseline as a primary way to deal with stressful situations may actually benefit less from this type of treatment ($p = .074$). Use of logistic regression to predict responders versus non-responders yielded a similar pattern. Examination of Table 4 indicates that all other predictor variables included in this study were non-significant.

Discussion

Outcome results support prior findings that CBT can be an effective treatment for a variety of sub-types of late life depression. Yet, it is noteworthy that about 33% of this sample did not show significant improvement in their depression from pre to post treatment, despite the fact that the PEP program was administered by trained personnel who were carefully monitored throughout the study for treatment fidelity. This suggests that there likely are other factors operating that limit the older person's ability to respond to CBT. Previous studies of geriatric depression also suggest that other variables such as social support, personality variables, and demographic factors may influence treatment outcome (Kiosses et al., 2011). Based on our review of this literature, we explored the possible predictive contribution to CBT treatment outcomes of a variety of demographic, health, and psychosocial variables through the use of regression analyses. Significant findings support the notion that certain psychosocial variables affected participation in therapy, to either enhance, or impede, the person's ability to benefit from a 12-session course of individual CBT. Note that health and cognitive status, and demographic variables, were largely non-significant, in contrast to findings of Alexopoulos and colleagues (2002) and data presented in the reviews by Pinquart et al. (2007) and Kiosses et al. (2011).

A review of Table 4 indicates that a substantial proportion of additional variance in BDI outcome was accounted for certain specific variables. The variables most predictive of *poorer* response to CBT were: current impact of prior stressful life events, increased external locus of control, decreased external blame, decreased openness to experience, and low use of emotional support as a form of coping with stress. Trends were noted for education (lower education was associated with poorer outcome) and for active coping. Frequent use of active coping strategies was associated with poorer response – possibly because those strategies weren't working (the person was still depressed), thus requiring flexibility and resilience to try out other options which depressed persons tend not to have. What seems particularly striking is the substantial contribution made by variables reflecting how the

depressed older adult perceives and responds to high impact stressful events. This was a novel and original finding in that these kinds of variables have not been studied before in CBT research specifically focused on older adults. The most highly significant predictor of BDI response was the current impact of past stressful life events. Also strongly significant was the association of external blame with a better response to CBT: perhaps by seeing other people as responsible for the occurrence of stressful situations, the depressed person is able to shift focus to how they *respond* to the situation (rather than dwelling on the fact of it occurring). Additionally, the use of emotional coping strategies (expressing feelings, seeking emotional support to help with coping) was highly significant. This may reflect the older person's awareness that by reaching out to others, depressed feelings can be mitigated.

In summary, most of our findings are consistent with prior research. However, some findings were contrary to expectations – e.g., the lack of significance of perceived social support was surprising, as was our expectation that extraversion would be associated with better outcomes. A possible explanation for the latter lies in the fact that a highly extroverted older adult may have difficulty with the introspection required to learn about how to modify unhelpful thinking patterns – a key component of CBT. Such individuals may be impatient with a therapy that asks them to become more internally focused, “take stock” of themselves, and then engage in a systematic program of change. We also did not confirm prior studies that found significant effects for health and cognitive status on the older person's ability to participate in psychotherapy. It may be that this lack of significance is due to poor choice of measures – the SF 12 asks for perceived health and does not assess actual health problems or functional limitations in depth. The Mini-Mental, one could argue, can be problematic due to it being such a quick screen for such a complex topic. In fact, there are relationships between some of the neuropsychological measures and BDI outcome. These findings are addressed, in depth, in a separate manuscript, which is in preparation at this time.

This study had several limitations that we wish to bring to the reader's attention. First, it was not a randomized controlled trial (RCT). It was a single group, pre-post design and lacked a control group. This was a deliberate decision, however, in that the research focus was on exploring the contribution of various predictor variables that heretofore had been little studied with depressed older adults receiving CBT. Unfortunately, this meant that several possible confounding variables such as therapist attention alone, and not the specific methods of CBT, could not be controlled in this study. Second, we enrolled participants with a broad range of depression diagnoses, as well as a substantial number of racial or ethnic minority persons. These factors increased the heterogeneity of the sample and may have made it more difficult to demonstrate statistical significance. Third, the sample size was relatively small for a study of a group of predictors; clearly, these findings need replication with larger, more homogenous samples of depressed older adults.

Despite these limitations, the current study contributes to the evidence base that CBT is an effective treatment for many older adults with depression. Our findings also suggest that older adults who are troubled by the traumatic events of their past, have weak social and emotional supports, are less open to experience, and who tend to blame themselves for their problems, are more likely to have a poorer response to short term CBT.

Taken together with prior research, results of this study suggest several clinical implications for therapists working with depressed older adults. First, it is important to assess for social and emotional supports and for personality factors that may contribute to the client's ability to respond well to short term CBT, which can be assessed through short questionnaires or in the clinical interview. If factors such as weak social supports or the tendency to blame others are found, then the therapist might suggest that improvement in these targets could be a goal

of CBT. Second, some factors, such as being highly troubled by past stressful life events, or having significant personality issues, may require modifications of CBT (as is the case with post-traumatic stress disorder), or may require an entirely different form of therapy, such as dialectical behavioral therapy for borderline personality disorder. These are just some examples that highlight the importance of thorough assessment and require the therapist to be open to other approaches that may better match the needs of the client. Third, although we did not find a significant association between MMSE score and depression outcome, we recommend thorough evaluation of the cognitive processing skills of the individual prior to starting CBT. Several studies have found that reduced cognitive capacity (particularly signs of executive dysfunction such as poor planning and decision-making) is associated with poorer response to many treatments for depression (see Alexopoulos et al., 2011).

In summary, it is clear that future research on this topic of who is most likely to benefit from CBT will need to be more comprehensive in nature and be conducted with larger, more homogeneous samples. It is our hope that this kind of research will enable us to more accurately determine, at baseline or intake assessment, which older adults are more likely to respond to this relatively expensive, time-consuming treatment. Being able to do this more effectively will decrease mental health costs and increase quality of life for depressed older persons.

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Table 1

Socio-Demographic Characteristics for the Participants (N=60)

Characteristic	n	(%)
Gender		
Female	37	(62)
Male	23	(38)
Age (mean $\pm$ SD)	(69.70 $\pm$ 7.38)	
60–69	33	(55)
70–79	21	(35)
80–89	6	(10)
Race and Ethnicity		
White	48	(80)
Asian	6	(10)
Black	3	(5)
American Indian	3	(5)
Hispanic	6	(10)
Native Language		
Other than English	15	(25)
Marital Status *		
Not Married	37	(62)
Married	22	(37)
Children (mean $\pm$ SD)	(2.18 $\pm$ 1.61)	
0–2	34	(57)
3 or more	23	(38)
Education Level * (mean $\pm$ SD)	(14.3 $\pm$ 1.94)	
High School or less	7	(9)
Some College or more	55	(91)
Employment *		
Not employed	42	(70)
Full or Part Time	15	(25)
Household Income *		
Less than \$40,000	31	(52)
\$40,000 – 79,000	11	(18)
\$80,000 or more	12	(20)
Current Living Situation		
Living Alone	28	(47)
Spouse/Children/Relative	32	(53)
MMSE (mean $\pm$ SD)	(28.32 $\pm$ 1.67)	

Note.

* Not all participants provided answers in these categories

Table 2

Mean Change Pre- and Post-Intervention on the BDI-II

Gender	n	BDI-II Pre-Intervention		BDI-II Post-Intervention	
		M	(SD)	M	(SD)
Female	37	24.24	(9.84)	15.84	(11.37)
Male	23	18.30	(9.68)	10.17	(6.14)
Total	60	21.97	(10.12)	13.67	(10.03)

Table 3

Model Summary of Regression of BDI-II on Predictor Variables

Model	R	R ²	Adjusted R ²	Std. Error of Estimate	Change Statistics			
					ΔR ²	ΔF	df1	df2
1	.642 ^a	.413	.403	7.752	.413	40.771	1	58
2	.841 ^b	.707	.568	6.595	.294	2.229	18	40

^aModel 1 includes Predictors: (Constant), BDI-II Baseline Total

^bModel 2 includes all additional Predictors: (Constant), Total Baseline BDI-II Score, External locus of control for changing stressful events, Age, Impact of stressful events, Internal locus of control for changing stressful events, Extroversion, MMSE, Emotional Support, Years of School Completed, Total of recent stressful incidents, Physical Health, Assuming responsibility for the occurrence of the stressful situation (Internal Blame), Denial, Openness, Attributing responsibility to others for the occurrence of the stressful situation (External Blame), Social Support, Neuroticism, Integration of Stressful Life Events, Active Coping

Table 4

Coefficients for Predictor Variables

Model	Unstandardized Coefficients			
	B	Std. Error	t	Sig.
1 Constant	-.314	2.407	-.131	.897
BDI-II Baseline Total	.636	.100	6.385	.000
2 Constant	3.989	25.191	.158	.875
BDI-II Baseline Total	.614	.145	4.236	.000
MMSE Baseline	.531	.599	.887	.381
Years of School Completed ¹	-.776	.403	-1.927	.061
Age ¹	-.028	.137	-.202	.841
Neuroticism ²	-.103	.213	-.481	.633
Extroversion ²	1.639	1.343	1.221	.229
Openness ²	-.322	.156	-2.060	.046*
Physical Health ³	.124	.146	.849	.401
Social Support ⁴	-.255	.287	-.889	.379
Total of recent stressful incidents ⁵	-.209	.341	-.614	.542
Internal locus of control for changing stressful events ⁶	.810	.790	1.025	.311
External locus of control for changing stressful events ⁶	2.110	.838	2.519	.016*
Assuming responsibility for the occurrence of the stressful situation (Internal Blame) ⁶	-.765	.779	-.982	.332
Attributing responsibility to others for the occurrence of the stressful situation (External Blame) ⁶	-1.941	.767	-2.531	.015*
Impact of stressful events ⁷	.747	.258	2.901	.006**
Active Coping ⁸	1.535	.837	1.835	.074
Denial ⁸	.705	.832	.848	.401
Emotional Support ⁸	-1.954	.689	-2.834	.007***
Integration of stressful life events ⁹	-.118	.093	-1.267	.212

Note.

¹ Variable from the study's demographics survey.

- ² Variables from the Big Five Inventory (John, Naumann & Soto, 2008).
 - ³ Variable from the Health Questionnaire (SF-12v2) (Ware, Kosinski and Keller, 1996).
 - ⁴ Baseline total from The Abbreviated Duke Social Support Index, (Koenig et al., 1993).
 - ⁵ Baseline total from the Elders Life Stress Inventory (Aldwin, 1990).
 - ⁶ Variables based on locus of control theory (Rotter, 1966; Canton, 2007).
 - ⁷ Baseline total score from The Impact of Events Scale-6 (IES-6) (Thoresen et. al, 2010).
 - ⁸ Variable from the Brief Cope (Carver, 1997).
 - ⁹ Baseline total from the Intergration of Stressful life Events Scale (Holland et al, 2010).
- * $p < .05$.
- ** $p < .01$.